Tom's Copy

WEIR

Non Industrial Timber Management Plan

Mendocino County, CA

Craig Blencowe
Registered Professional Forester
License #2003

Thembi Borras
Apprentice Forester

Winter 1999/2000

NON-INDUSTRIAL
TIMBER MANAGEMENT PLAN
STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY AND FIRE PROTECTION

This Non-Industrial Timber Management Plan (NTMP) is designed to comply with the Forest Practice Act (FPA) and the Board of Forestry rules and specifically PRC 4593-4594.7 and Title 14 CCR 1090-1090.27

Ia. Timberland Owner(s): Name: Paul A. Weir
Address: POB 362
City: Comptche State: CA Zip: 95427 Phone: (707) 937-4971

Ib. Timberland Owner(s): Name: Mark and Dana Weir
Address: PO Box 372
City: Comptche State: CA Zip: 95427 Phone: (707) 937-5571

IIa. Timber Owner(s): Same as Ia.

IIb. Timber Owner(s): Same as Ib.

III. RPF preparing NTMP: Name: Craig Blencowe RPF Number: 2003
Address: 26221 Omar Drive
City: Fort Bragg State: CA Zip: 95437 Phone: (707) 961-1300

IVa. Plan Submitter(s): Same as Ia.

IVb. Plan Submitter(s): Same as Ib.

V. Forest District in Which the NTMP is Located:

[X] COAST FOREST DISTRICT
[ ] Southern Subdistrict of the Coast F.D.
[ ] SOUTHERN FOREST DISTRICT
[ ] High Use Sub-district of the Southern F.D.
[ ] Tahoe Regional Planning Authority
[ ] County with Special Regulations:
[ ] Special Treatment Area(s):
[ ] Other:

VI. Location of NTMP by legal description:

Base and Meridian [X] Mount Diablo [ ] Humboldt [ ] San Bernardino

Section	Township	Range	Acreage	County
21, 22, 27, & 28	16N	15W	238	Mendocino
		Total Acreage:	**238**	

VII. General Area Location: The proposed project area is located approximately 4 air miles South and East of the town of Comptche, CA. in the Navarro River watershed.

VIII. U.S.G.S. Quadrangle Map on which property is located: Navarro 7.5 Minute Quadrangle

NTMP Certification and Signature Page

Registered Professional Forester: I certify that I, or my designee, personally inspected the plan area, and the plan complies with the Forest Practice Act and the Forest Practice Rules.

Signature: _____ Date: 3 Dec 99.

The above conforms to my/our plan and, upon filing, I/we agree to conduct harvesting in accordance therewith. Consent is hereby given to the Director of Forestry, his agents and employees, to enter the premises to inspect timber operations for compliance with the Forest Practice Act and the Forest Practice Rules.

Timberland Owner(s):
Signature(s): _____ Date: 12-24-99
Printed Name(s): PAUL A. WEIR

Timberland Owner(s):
Signature(s): _____ Date: 12/24/99
Printed Name(s): MARK WEIR DANA WEIR

Timber Owner(s):
Signature(s): _____ Date: 12-24-99
Printed Name(s): PAUL A. WEIR

Timber Owner(s):
Signature(s): _____ Date: 12 24 99
Printed Name(s): MARK WEIR DANA WEIR

DIRECTOR OF FORESTRY

This Non-Industrial Timber Management Plan conforms to the rules and regulations of the Board of Forestry and with the Forest Practice Act.

By: _____ _____
(Signature) (Date)

_____ _____
(Printed Name) (Title)

NOTICE OF PREPARATION (CCR 1090.2)

NONINDUSTRIAL TIMBER MANAGEMENT PLAN OR AMENDMENT # _____

A Nonindustrial Timber Management Plan (NTMP) or Amendment to an existing NTMP that may be of interest to you has been submitted to the California Department of Forestry and Fire Protection (CDF) for a determination of compliance with state laws and rules. The following information summarizes the management plan, where and how to obtain details of the plan, and to whom and by when public input regarding the plan should be submitted.

Questions about the NTMP, Amendment or general questions regarding timber harvesting in California should be submitted to:

California Department of Forestry
Coast-Cascade Region Office
*** NTMP Info.***
135 Ridgeway Ave.
Santa Rosa, CA 95401
(707) 576-2275

A copy of the NTMP or Amendment may be obtained from the above-listed CDF office at the applicable rates.

Summary of NTMP or Amendment Information

Plan Submitter: _____

Timberland Owner: _____

Registered Professional Forester: Craig Blencowe, RPF #2003

The NTMP location is described below by county, section, township & range, and direction and distance to the nearest community or well-known landmark: Mendocino County. Portions of Sections 21, 22, 27 and 28; T 16N; R15W; MDB&M. Located approximately 4 air miles south and east of the town of Comptche

Name of the (1) nearest perennial stream and (2) major watercourse flowing through or downstream from the NTMP area:
(1) John Smith Creek (2) North Branch North Fork Navarro River

NTMP acreage: 263 acres

Proposed harvesting method(s) and silvicultural treatment(s):
tractor / Selection

The Date of Filing for the NTMP or Amendment was _____.
The earliest estimated date for the Director's Determination on the plan is _____, which is 45 days from the date of filing of the plan by CDF. A Review Team Meeting will be held on this NTMP. Depending on the review required, the Director's determination on the NTMP or Amendment will usually be made within 55 days from the Date of Filing. Please contact the CDF office above for more information.

Comprehensive list of adjacent landowners (within 300' of project boundary) to property of Weir (125-280-44, 57+58-00)

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Philbrick Family Partnership
8867 North Fuller Court
Fresno, CA 93720

John M. Hammerman
230 Stonewall Rd.
Berkeley, CA 94705

Comptche Community Farms
POB 251
Comptche, CA 95427

Marlene Ruth Tobias
4106 Emerald
Oakland, CA 94609

Mendocino Redwood Company
POB 390
Calpella, CA 95418

Source: Mendocino County Assessor Parcel Maps

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PREFACE

In 1999, Craig Blencowe, Consulting Forester was commissioned to prepare a Non-Industrial Timber Management Plan (NTMP) on 263 acres for adjacent landowners Mark and Dana Weir and Paul and John Weir on timberland 4 air miles south and east of the town of Comptche. Paul and John Weir own 160 acres. Mark and Dana Weir own 103 acres. As 20 acres of the total combined acreage is dedicated pasture, the project area is only 238 acres.

This plan is being submitted to the California Department of Forestry per the requirements of the Forest Practice Rules (Title 14 CCR).

Each ownership will be managed as a unit, thus there will be two management units. The body of the NTMP is divided into three sections:

Section One: In section one, general concepts, background, and management philosophy that pertain to both management units are discussed.

Section Two: Section two is separated into subsections per management unit, in which harvest operations and growth yield and allowable cut are detailed.

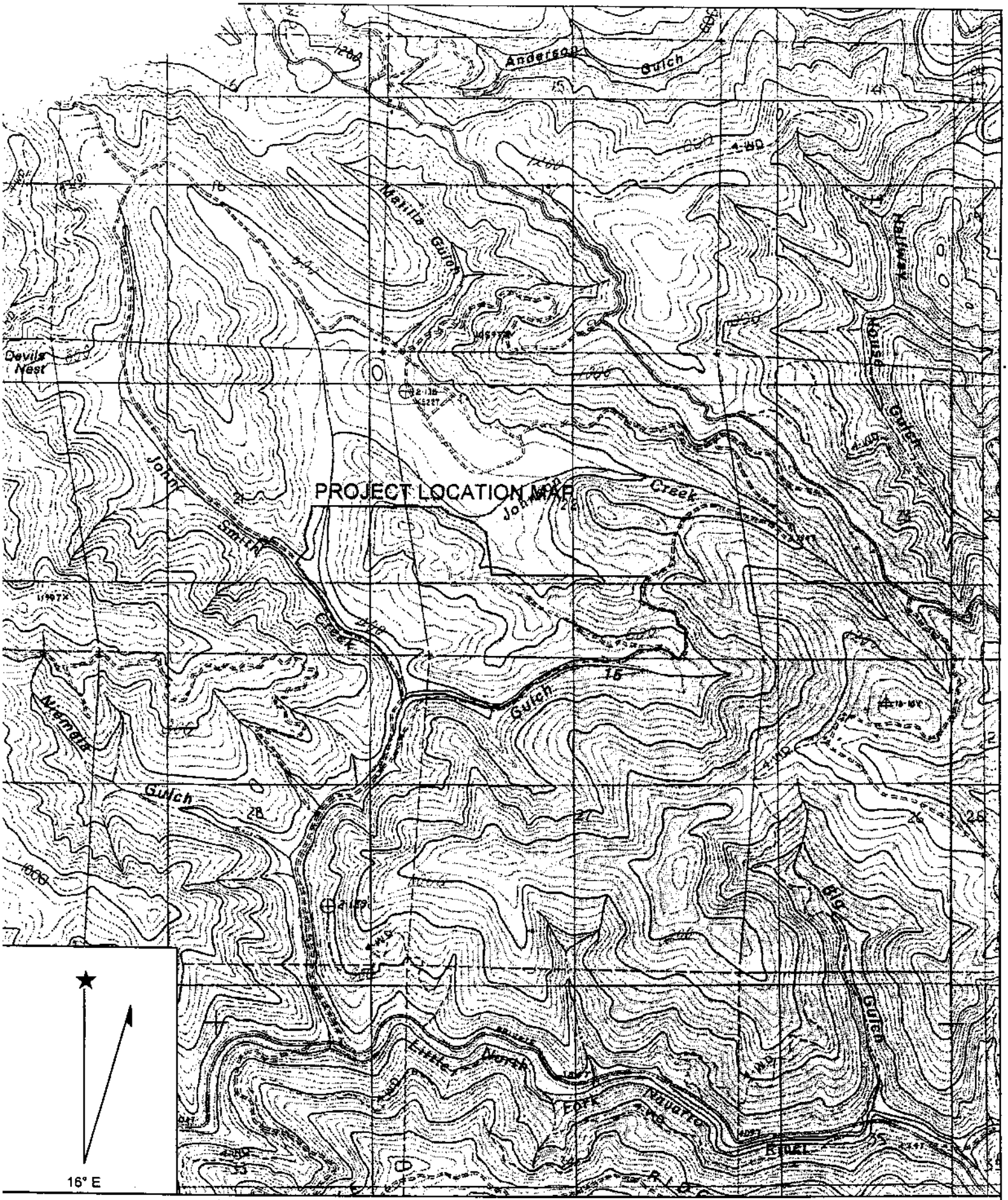
Section Three: Section three contains the Cumulative Impacts Analysis.

The **Appendix** includes supplementary information, supporting data and a discrete **Confidential Addendum**, in which archaeology is contained.

SECTION ONE

DISCLOSURE

This portion of the NTMP contains information that is pertinent to both management units and to the project area as a whole. Rather than repeat the information in the discussion of each management unit, it is included herein.



Name: NAVARRO
Date: 10/27/99
Scale: 1 inch equals 2000 feet
——: PROJECT BOUNDARY

Location: 10 454608 E 4341936 N
Caption: WEIR NTMP
Portions of S. 21, 22, 27 and 28; T16N; R15W; MDBM
Contour Interval: 40'

GENERAL PROJECT AREA DESCRIPTION

The Weir project area is 238 acres located in Sections 21, 22, 27 and 28, Township 16 North, Range 15 West, Mount Diablo Base and Meridian and is 4 air miles south and east of the town of Comptche, CA in Mendocino County. The project area is bordered on the east and south by Sheep Trail Road and on the west by John Smith Creek Road. Additionally, a survey of the project area was conducted in 1990. All critical corners from that survey have been relocated. The project area is zoned for timber production.

The project area is accessed from Orr Springs Road (Comptche-Ukiah Road) by travelling west on said county road approximately 22 miles from Ukiah, thence southwesterly through a locked gate via a permanent easement on Matilla Road through private lands to the northeastern corner of the project area.

The project area is drained by John Smith Creek and its tributaries, Johnson Creek and Gulch 15. John Smith Creek is a tributary to the North Branch North Fork of the Navarro River. John Smith Creek is a coho and steelhead bearing watercourse.

Slopes vary from less than 5% on the ridgetops and in portions of the riparian area to over 65% in isolated pockets in the riparian area and on the sidehills. The majority of the project area is gently sloping,. Elevations vary from 380 to 760 feet above sea level. Annual precipitation is 55 inches. Aspect is generally southwesterly.

GENERAL SITE AND TIMBER STAND DESCRIPTION

The project area is classified as site class III forestland. Soil complexes include the Ornbaun-Zeni, Yellowhound-Kibesillah and Comptche-Zeni.

Generally, these are moderately deep soils suitable for the production of commercial quality timber. The Ornbaun-Zeni complex underlies the majority of the project area and supports the small component of grassland on the project area. The underlying geologic formation is Franciscan - muddy and sandy sediments deposited on the deep ocean floor and then jammed against the sea floor itself. The Franciscan formation in this area is relatively young and less deformed than most Franciscan sediments.

Past management and site condition has shaped the present timber stand components. These components include:

- Young (forty years old) second growth redwood in dense clumps in a matrix of grassland. Present in the matrix are scattered and dense thickets of young Douglas-fir trees, advanced pine regeneration and scattered merchantable pine.
- Young (forty years old) second growth redwood in dense clumps in a matrix of small diameter often shrubby hardwoods. Present in the matrix are scattered and dense thickets of young Douglas-fir trees. There is no pine in the matrix.
- Present on portions of north facing slopes is a young-growth Douglas-fir, and to a lesser extent, redwood overstory. For the most part, trees are very dense with large numbers of suppressed Douglas-firs. There is no pine. Widely scattered residual redwood remains.
- Grassland.

Hardwood species include tanoak, Pacific madrone, California bay and live oak. Coexisting understory species include blue blossom, greenleaf manzanita, evergreen huckleberry and coyote brush. Bigleaf maple, Pacific wax myrtle and willow are a component in the riparian corridors.

HISTORY OF FOREST MANAGEMENT, OWNERSHIP AND USE

Historically, these properties were contained in one ranch ownership.

The ranch was originally homesteaded by Isaac Johnson in the late 1800's. The Johnsons used the land as a working ranch for many years. A very old orchard and remnants of livestock management still exist. The buildings on the ranch were built in the 1920's and early 1930's. The ranch was abandoned by the Johnsons around 1940. The Johnson children had little interest in the working ranch and sold it to Don Philbrick around 1950. Philbrick was operating a sawmill in the area. The property was harvested in 1950 to supply this mill. This was the first harvest. Philbrick attempted to convert the entire ranch to grazing land in

1959. The remaining timber was clearcut, the ranch burned and aerially seeded with non native grasses at this time.

James and Joan Mickle purchased the ranch from Don Philbrick in 1967. The Mickles planted Ponderosa and Monterey pine at approximately the same time. The pine was planted to serve as a nurse crop to provide shade for future planting of redwood and Douglas-fir. In 1982 the Mickles harvested approximately 500,000 board feet, under a 1981 CDF approved timber harvest plan (THP). Half of this amount was redwood, the other half was Douglas-fir. In 1992, the Mickles prepared for planting by disking a 60 acre area(in the west unit) in which they planted ponderosa pine and Douglas-fir seedlings. Trees were planted on a 8 foot by 8 foot spacing.

The Mickles built a small cabin on the property for recreational visits. Cattle was also grazed during this era. In 1996 the Weirs purchased the Micklewood Ranch.

MANAGEMENT GOALS AND OBJECTIVES

It is the goal on the Weir project area to insure long-term and sustained-yield production of quality forest products in a healthy, vigorous and diverse forest while protecting the associated values of watershed, wildlife, fish, soils, recreation and aesthetics.

While minor differences may exist between the two management units, the objectives to attain the overall management goal remains basically the same for each management unit.

These objectives are:

a) Use each harvest as an opportunity to adjust the spacing, size, and quality of the timber stand.

b) Increase inventory by harvesting less than periodic growth until sustained-yield is achieved.

c) Employ selection prescription and individual tree marking to remove low quality trees and retain high-quality vigorous trees.

d) Maintain trees in all sizes and age classes, from seedlings to 80 year-old trees (selected trees will be allowed to reach maturity), which attain "target" sizes of 24"-28" for Douglas-fir and 28"-30"+ for redwood.

e) Favor redwood, but not to exclusion of other species; maintain natural ecological balance.

f) Discourage non native pine competition with redwood and Douglas-fir. Replace the current component of Monterey and Ponderosa pine with redwood and Douglas-fir.

g) Improve conifer growth by controlling hardwoods, pre-commercial thinning, and replanting.

h) Maintain an overall annual growth rate of 4% on standing inventory of 17,500 board feet per acre.

i) Accept less than optimum production where necessary to preserve related forest values.

j) Maintain grassland dedicated to agriculture and homesteading.

ALTERNATIVES

The objective of both land owners is to manage the project area for timber production. Thus, alternative uses such as no project, or sale of property to a conservation group are not compatible with the landowner's objectives. Timing of timber harvesting is proposed to coincide with market and climatological conditions, as this corresponds with prudent land management.

SOILS, SITE INDEX AND GEOLOGY

The 1987 Natural Resources Conservation Service soil survey depicts three soil complexes in the project area: Ornbaun-Zeni, Yellowhound-Kibesillah and the Comptche-Zeni. The Ornbaun-Zeni complex is best represented in the project area. See Soils Map.

Ornbaun-Zeni Complex (130-132) – 207 acres

This complex is separated into several slope classes, three of which are associated with the plan area. They are Ornbaun-Zeni 130 (9 to 30%), 131 (30 to 50%) and 132 (50 to 75%). The Ornbaun-Zeni 130 is located on the gently sloping terrace above John Smith Creek and occurs in a narrow band in the east unit of the project area. The Ornbaun-Zeni 131 encompasses portions of the ridge and side slopes. The Ornbaun-Zeni 132 covers portions of the side slopes and constitutes portions of the toe slope along Gulch 15. Slopes range from being gentle to moderately steep. For the most part, they are gentle.

This complex is a combination soil type, with such intricately intermingled components that it is not practical to separately map them.

The Ornbaun soil forms 45% of this complex. Derived from sandstone, this is a forest soil capable of growing commercial quality Douglas-fir and redwood. It is a deep, well-drained loam, with an effective rooting depth of 40 to 60 inches. Surface runoff is very rapid, permeability is moderate and the erosion hazard is severe under bare soil conditions. Water-holding capacity is high, ranging from 6.5 to 10.0 inches.

The Zeni soil forms 40% of this complex. Like the Ornbaun soil, it is also derived from sandstone, but it is a shallower soil. Effective rooting depth is only 20 to 40 inches. The Zeni soil has a low or moderate water holding capacity. Runoff, permeability and erosion are similar to the Ornbaun soil.

Douglas-fir, Redwood, tanoak and Pacific madrone are the main tree species that occur on this soil complex. For a fully stocked redwood stand on the Ornbaun soil, the potential annual production is 770 board feet per acre; on the Zeni soil, it is 525 board feet.

Steepness of slope, erosion hazard and seasonal soil wetness are the main soil limitations to timber harvest. These concerns can be ameliorated by restricting tractor use on steep slopes and limiting tractor use to existing and stable trails. Where topography permits, cable yarding can be employed to reduce soil disturbance. Use of equipment when the soil is wet produces ruts, compacts the soil, and can damage tree roots. Waterbars and/or mulch cover are essential to prevent rill and gully erosion on skid trails, roads and steep cut and fill slopes. Roads are dusty when dry. During operations, all truck roads will be watered as often as necessary to maintain a relatively dust-free surface to reduce dust build-up.

Plant competition is a concern in the production of timber on this soil. Regeneration of conifers can be delayed due to invasion of brush in canopy openings. Inter-planting of Douglas-fir and redwood seedlings will help augment natural regeneration.

Elevations range from 380 ft to 760 ft above sea level. The aspect is generally south west with small portions of land facing north.

Yellowhound-Kibesillah Complex (352) – 20 acres

This complex is isolated in a moderately sloping mid slope position in the west unit of the project area. Although soil phase 352 is defined as supporting slopes that range from 50 to 75%, slopes are moderate, with isolated steeper pockets that average 65%.

This complex is a combination soil type, with such intricately intermingled components that it is not practical to separately map them.

The Yellowhound soil is a gravelly loam that forms 45% of this complex. Derived from sandstone, it is a deep, well-drained soil, with an effective rooting depth of 40 to 60 inches. Surface runoff is very rapid,

permeability is moderate and the erosion hazard is severe under bare soil conditions. Water-holding capacity is low or moderate.

The Kibesillah soil is a very gravelly loam that forms 35% of this complex. Like the Yellowhound soil, it is also derived from sandstone, but it is a shallower soil. It is a moderately deep, well drained soil with an effective rooting depth of 20 to 40 inches. The Kibesillah soil has a very low water holding capacity. Runoff, permeability and erosion are similar to the Yellowhound soil.

Douglas-fir, redwood, and tanoak are the main tree species that occur on this soil complex. For a fully stocked Douglas-fir stand on the Yellowhound soil, the potential annual production is 630 board feet per acre; on the Kibesillah soil, it is 335 board feet.

Steepness of slope and erosion hazard are the main soil limitations to timber harvest. These concerns can be ameliorated by restricting tractor use on steep slopes. Cable yarding can also be employed to reduce soil disturbance. Deep soil disturbance may contribute to the occurrence of landslides, thus tractor use should be limited to existing and stable skid trails. Use of equipment when the soil is wet produces ruts, compacts the soil, and can damage tree roots. Waterbars and/or mulch cover can be used to prevent rill and gully erosion on skid trails, roads and steep cut and fill slopes. During operations, all truck roads will be watered as often as necessary to maintain a relatively dust-free surface to reduce dust build-up. Rock for road maintenance may be available in this unit.

Seedling establishment and plant competition are a concern in the production of timber on this soil. The droughtiness of the surface layer reduces the survival of seedling on the Kibesillah soil, especially on south and southwest facing slopes. Movement of loose surface material can also reduce seedling survival. Additionally, regeneration of conifers can be delayed due to invasion of brush in canopy openings. Inter-planting of Douglas-fir and to a lesser extent redwood seedlings will help augment natural regeneration.

Elevations range from 400 ft to 760 ft above sea level. The aspect west.

Comptche-Zeni Complex (191) – 11 acres
This complex is isolated in a gently to moderately sloping mid and upper slope position in the east unit of the project area. Slopes are moderate, ranging from 30 to 50%.

This complex is a combination soil type, with such intricately intermingled components that it is not practical to separately map them.

The Comptche soil forms 50% of this complex. Derived from metamorphosed basalt, it is a deep or very deep, well-drained soil, with an effective rooting depth of 40 to 70 inches. Surface runoff is rapid, permeability is moderately slow and the erosion hazard is moderate under bare soil conditions. Water-holding capacity is low or moderate.

The Zeni soil forms 30% of this complex. Unlike the Comptche soil, it is a moderately deep well-drained soil derived from sandstone. Effective rooting depth is only 20 to 40 inches. Surface runoff is rapid, permeability is moderate and the erosion hazard is severe under bare soil conditions. The water holding capacity is similar to the Comptche soil.

Tanoak, Douglas-fir, redwood and Pacific madrone are the main tree species that occur on this soil complex. For a fully stocked redwood stand on the Comptche soil, the potential annual production is 1045 board feet per acre; on the Zeni soil, it is 980 board feet.

Steepness of slope, erosion hazard and seasonal soil wetness are the main soil limitations to timber harvest. These concerns can be ameliorated by restricting tractor use on steep slopes and limiting tractor use to existing and stable trails. Where topography permits, cable yarding can be employed to reduce soil disturbance. Use of equipment when the soil is wet produces ruts, compacts the soil, and can damage tree roots. Waterbars and/or mulch cover are essential to prevent rill and gully erosion on skid trails, roads and steep cut and fill slopes. Roads are dusty when dry. During operations, all truck roads will be watered as

often as necessary to maintain a relatively dust-free surface to reduce dust build-up. Rock for road maintenance may be available in this unit.

Plant competition is a concern in the production of timber on this soil. Regeneration of conifers can be delayed due to invasion of brush in canopy openings. Inter-planting of redwood and Douglas-fir seedlings will help augment natural regeneration.

Elevations range from 600 ft to 760 ft above sea level. The aspect south.

Site Index
This is a measure of a soil's productive potential for growing commercial quality timber. The index is based on two parameters, tree height and age.

On the basis of 100 year curves, the project area shows a redwood site index of 109 (site class IV) to 152 (site class III), and a Douglas-fir site index of 109 (site class IV) to 155 (site class III). This means that a 100 year-old redwood and Douglas-fir tree will be 109 feet tall on the poorer growing sites (i.e. dry ridgetops) and 152 and 155 feet tall, respectively on the better growing sites (i.e. moist canyon bottoms). The small inclusions of site IV land support the range discussed above. However, these inclusions are too small to map, given that they occur in complex with another higher site soil.

Growth productivity of the project area soils are:

- Site III(with small inclusions of Site IV, too small to map) 238acres

Site index is only an average, both better and poorer microsites occur on the project area.

Geology
Several geologic features in the project area were identified by the Department of Mines and Geology in 1984. Additional features were identified during field reconnaissance. See Unstable Areas map for location and Section II, Unstable Areas for management considerations.

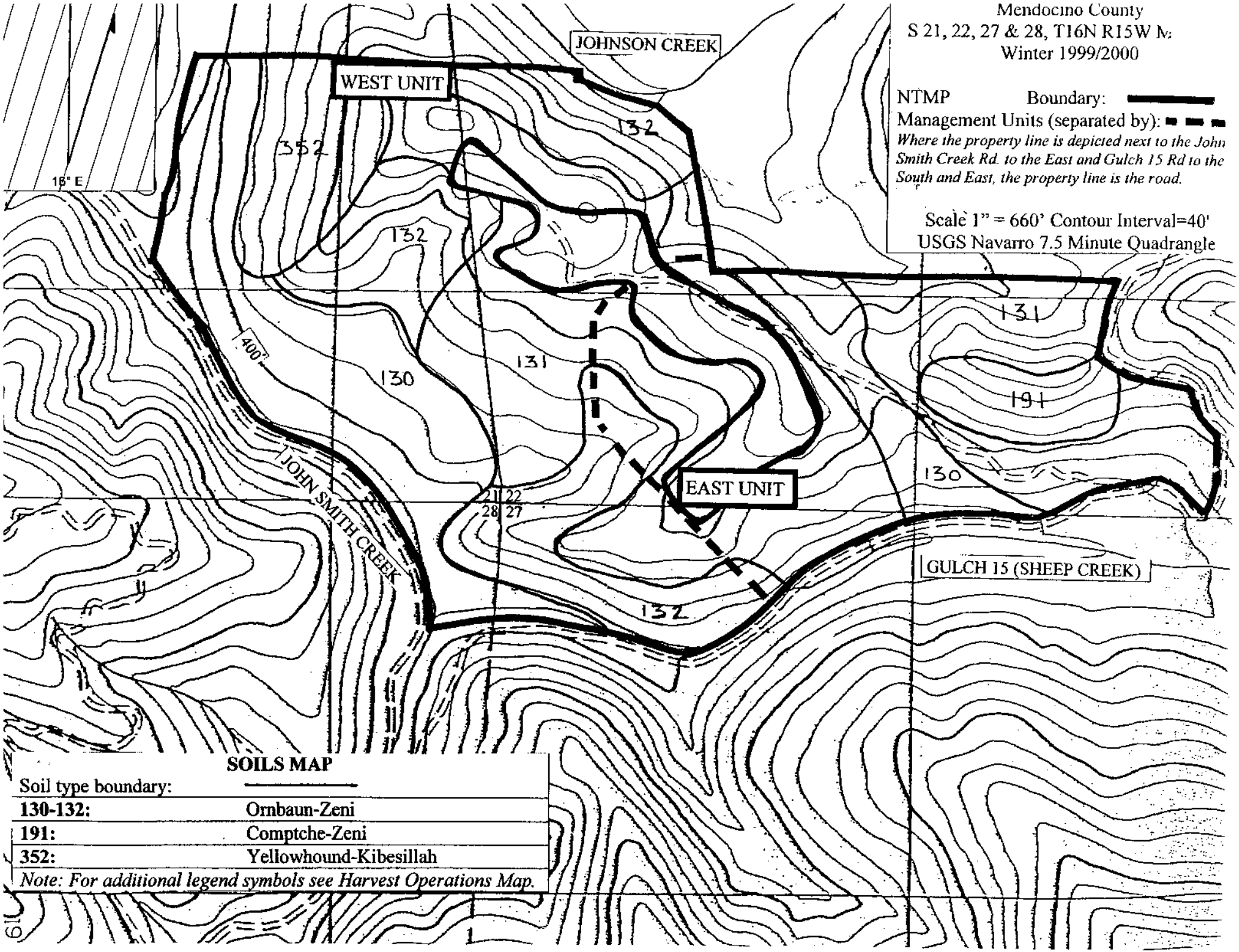
These features include

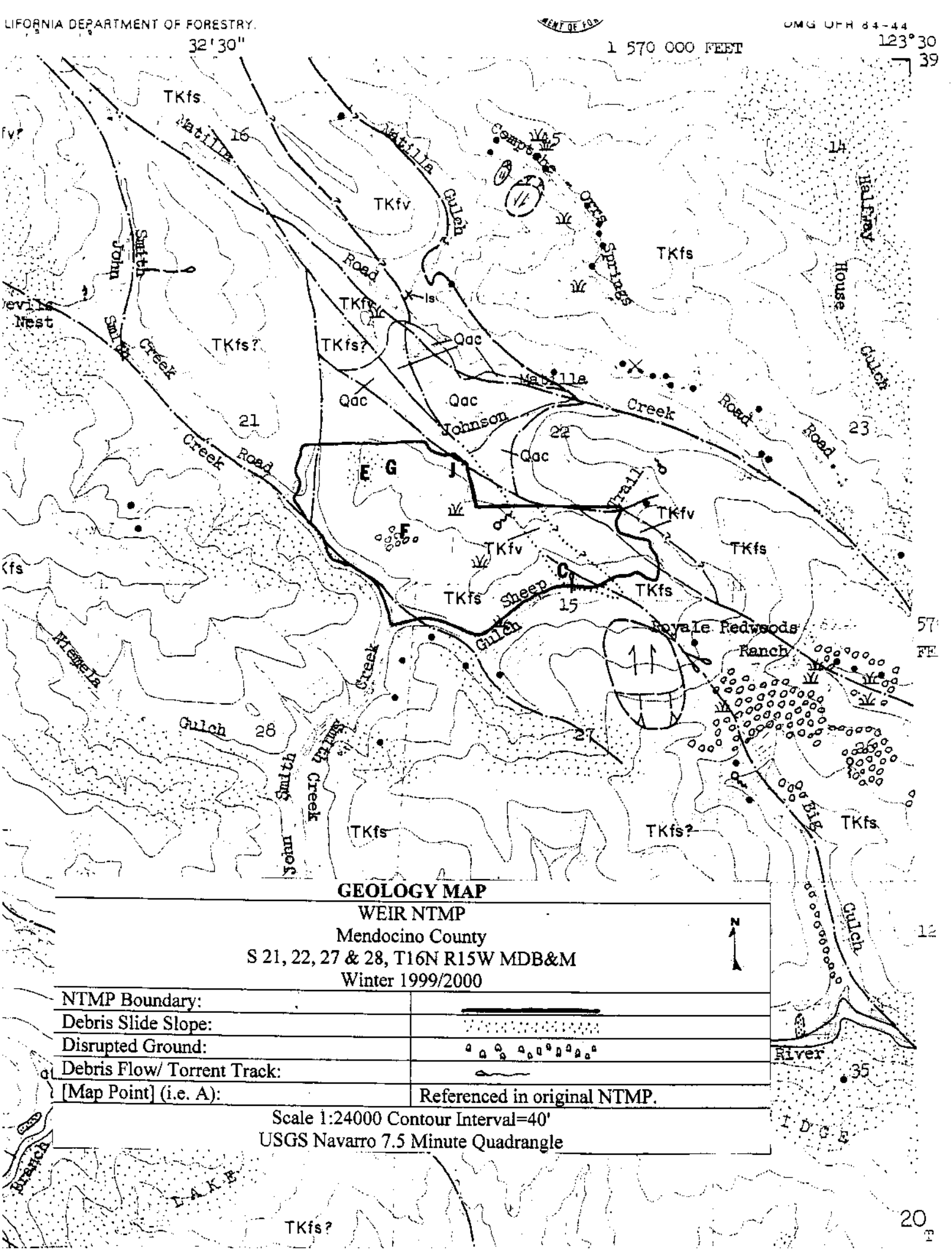
- Debris slide slope: Slopes are moderate, with isolated steeper pockets that average 65% and well vegetated with brush and conifer species. Soils are generally shallow, although the underlying Yellowhound-Kibesillah complex is defined as being moderately deep. By definition, this feature is characterized as having slopes that have been sculpted by numerous debris slide events.

- Disrupted ground: These areas are characterized by having an irregular ground surface (hummocky) caused by complex landsliding processes and may include areas affected by downslope creep, expansive soils, and/or gully erosion.

- Debris flow/ torrent track: This feature is characterized by long stretches of bare, generally unstable stream channel banks scoured and eroded by the extremely rapid movement of water-laden debris; commonly triggered by debris sliding in the upper part of the drainage during high intensity storms; scoured debris may be deposited downslope as a tangled mass of organic material in a matrix of rock and soil; debris may be reactivated or washed away during subsequent events. In 1984 this feature was identified as being active. : No longer active this feature appears to have stabilized and revegetated. Material lost in this event has come to rest above the road away from the watercourse.

- Slide: Evident on the 1996 aerial photos, this slide appears to have occurred in the last decade. An old road may have contributed to the failure. It is slightly less than 1/2 acre in size. The toe of the slide rests on a bench above Johnson Creek approximately 100 feet from the creek.


Mendocino County
S 21, 22, 27 & 28, T16N R15W M.
Winter 1999/2000
NTMP Boundary:
Management Units (separated by):
Where the property line is depicted next to the John Smith Creek Rd. to the East and Gulch 15 Rd to the South and East, the property line is the road.
Scale 1" = 660' Contour Interval=40'
USGS Navarro 7.5 Minute Quadrangle
JOHNSON CREEK
WEST UNIT
EAST UNIT
JOHN SMITH CREEK
GULCH 15 (SHEEP CREEK)
352
132
131
130
191
400'
21 22
28 27
SOILS MAP
Soil type boundary:
130-132: Ornbaun-Zeni
191: Comptche-Zeni
352: Yellowhound-Kibesillah
Note: For additional legend symbols see Harvest Operations Map.



GEOLOGY MAP

WEIR NTMP
Mendocino County
S 21, 22, 27 & 28, T16N R15W MDB&M
Winter 1999/2000

N

NTMP Boundary:	
Debris Slide Slope:	
Disrupted Ground:	
Debris Flow/ Torrent Track:	
[Map Point] (i.e. A):	Referenced in original NTMP.

Scale 1:24000 Contour Interval=40'
USGS Navarro 7.5 Minute Quadrangle

HARDWOODS

Hardwoods form a significant component of the forest stand in the Weir project area. The most prevalent species is tanoak. It is a component of the shrub layer and intermediate tree story layer. The majority of the tanoaks are small (less than 10 inches). Hardwood management will include personal firewood cutting and stand improvement where hardwoods directly compete with conifers.

Considerations for hardwood management:

a) Give preference to hardwoods overtopping or competing with conifers when selecting fuel-wood. Avoid damaging conifers when hardwoods are cut and skidded.

b) Retain large hardwoods (>16") for wildlife. Two to four large hardwoods are adequate per acre. Retain hardwood snags, where feasible.

c) Retain straight, thrifty hardwoods and remove defective, low-quality trees.

d) Where hardwood sprouting is desired, cut all stems from a hardwood clumps. Where, it is not desired, cut only half the stems.

e) Cut hardwood stumps as low as possible.

f) Hardwoods larger than 8"dbh, damaged during conifer harvest, are skidded and used for fuel-wood, where feasible.

g) Within the viewing area from roads and landings, slash is lopped and/or it is piled and burned.

Pre-commercial Thinning and Conifer Release

Pre-commercial thinning reduces the number of conifer stems per acre. This permits more recoverable growth to occur on fewer, but higher quality, stems. "Crop" trees should have at least 1/3 their height in vigorous crown. Poor quality trees should be weeded out and well-formed dominant trees retained. Spacing should vary from 6 to 14 feet.

Because the selective prescription makes only limited light available to young regeneration, thinning cost-effectiveness will vary within the project area, and will be dependent upon tree species and size.

Optimum economic return results when thinning redwood in the 3-6"dbh class, or 15-20' in height. Trees larger than this are not cost-effective to thin, and trees smaller than this have usually not yet fully expressed dominance.

Previous thinning of Douglas-fir in the Ten Mile River drainage has been followed by blackstain root disease attacking the "crop" trees.

For these reasons, the decision to pre-commercially thin will be made on a site-specific basis.

Of particular significance is competition between pine and merchantable conifers.

Where pine competes for growing space with redwood, and Douglas-fir, management should entail:

a) Hand cutting and lopping of pine when less than 8-12"dbh

b) Harvest of larger pine logs as market conditions develop. In other words, mature pine should not be cut and left solely to release other conifers, but should be cut when a market develops that can at least offset the costs

Note: See Pests and Diseases.

Young conifers should be released from overtopping hardwoods or pine by careful falling practices. If the hardwoods or pine are to be skidded, added care should be used when removing them from the woods; merchantable conifers should not be scraped or knocked over in this removal operation.

Slash within 100 feet or within the line of sight of truck and ranch roads, main skid trails, and landings will be lopped or bulldozer-crushed to within 30" of the ground.

Conifer Planting

Though all post-harvest stands will meet or exceed the Forest Practice stocking standards, where necessary, harvested areas will be inter-planted in the first winter after logging. The purpose of inter-planting is to:

a) maximize conifer stocking beyond Forest Practice standards.

b) encourage Douglas-fir and redwood regeneration.

Either bare root or plug stock may be used. If bare root seedlings are used, redwood and Douglas-fir will be two-year old stock. Spacing will be 10x10'. However, it is much more important to plant in the best micro-site than it is to adhere to strict spacing criteria.

On harsh south aspects, partial shade will protect seedlings. The north side of stumps, logs, and rocks, provide "dead" shade. Heavy grass sod is avoided, if possible. Favorable survival has been demonstrated when seedlings are planted in bracken fern areas.

Site Preparation

Following harvests, no site preparation is required. The natural disturbance associated with normal logging operations is adequate site preparation.

Seedling Protection

The effects of deer browsing could be problematic. However, where noted, this can be solved by application of vexar mesh tubes, either to the seedlings themselves or to the leaders of established saplings that deer can still reach, which are easily identified due to repeatedly cropped leaders.

If and when browsing becomes a problem on saplings, vexar can be applied to the apical leader until the sapling grows beyond the reach of the deer. Trees to be vexared can be selected on a 10x10' grid.

Pruning

Conifers along roadways and in high visibility areas should be pruned to a height of 8 to 16 feet. This pruning will improve visual penetration and aesthetics, and act as a shaded fuelbreak. Limbs should be cut close to the trunk, taking care not to scar the tree bole. Hand pruning, though more time-consuming, produces better results than a chain saw; it is also much safer when cutting overhead.

WILDLIFE

See Cumulative Impacts Analysis for a comprehensive discussion of biological resources.

Any changes regarding occurrence of listed species discovered or any physical environmental changes in the plan area, since the approval of the NTMP, will be reported on the Notice of Operations. Prior to future harvest entries relevant surveys will be conducted for up-to-date species including Board of Forestry Sensitive Species, and DFG/USFWS/NMFS listed, candidate or proposed species. If any are located in the affected area, mitigations will be formulated and submitted to CDF biologist(s) and relevant agency biologist(s). They will have ten working days to review and concur with these mitigation measures.

EROSION CONTROL

Potential sediment sources on the Weir project area include natural slides, stream-bank failures, road run-off, and road failures.

Slides and Stream-bank Failures

In general, there is little that can be done to prevent natural slides and stream-bank failures in areas away from human activity. In areas subject to human activity landslides can be triggered by decreased root cohesion, (where the tree species are removed), altered hydrologic patterns, and deep disturbance, especially in slide-prone areas. Similarly, stream-bank failures can be caused by altered drainage patterns and decreased root cohesion.

There are several unstable areas across the project area. They are discussed in section 1, Geology and section 2, Unstable Areas. Management strategies will incorporate avoidance of slide-prone areas (wherever possible) light selection (so that root cohesion is not undermined) and rectifying and maintaining low impact water flow patterns. Watercourses are afforded additional protection measures including high canopy retention, thereby reducing the impact of tree removal as it contributes to stream-bank failure.

Where and when possible, slide and failure induced sedimentation will be stabilized to prevent additive contamination of the watercourses. For example, where they are accessible, slides should be seeded in the autumn following their occurrence (per section 1, seeding) and/or failure material that has the potential to reach a watercourse be removed from that path by drifting the material away from the watercourse.

Seeding

All areas to be seeded (including road side-cast in excess of 20 feet[none expected] and all landings) will use a mixture of annual rye, barley, and crimson clover at a rate of 25 lbs. per acre. Where necessary, straw/slash mulching will accompany seeding at a rate sufficient to cover 90% of the area to a depth of at least 1" at the time of application.

If 100 contiguous square feet or more soil is bared within the Class I or II WLPZ (none expected), it will be seeded as described in the previous paragraph.

Roads

In most areas where logging has occurred in California, roads are the major sediment contributors. Road erosion on the Weir project area has potential to occur, primarily in the form of surface erosion from unrocked roads and skid trails. However, this is not as great a concern as the majority of the road network in the Weir project area is rocked.

The greater part of the road network on the Weir project area is existing on which an intermittent rocked surface is maintained. Although no harvest operations are proposed during the winter period or saturated soil conditions, the landowners use the rocked road network for access to their properties year-round. Vehicle traffic is not advisable or anticipated on the unrocked spurs of the road network under normal winter conditions

The main truck and ranch roads are located on gentle ground with gentle pitches. Portions of the Sheep Creek road are within the watercourse lake protection zone (WLPZ). As they are rocked and will not conduct log truck traffic during the winter period, significant adverse impacts are not anticipated (see Section 2, Truck Road in WLPZ). Currently, the roads are drained by a combination of outsloped stretches and inside ditches outleted through relief culverts. Drainage could be greatly improved by the installation of rolling dips and enhancement of the outsloping. Several improvements will be made to improve the integrity of the road. They are discussed in section 2, Roads and Landings. Watercourse Crossings are discussed in section 2, Watercourse Protection.

No new trails will be constructed on slopes greater than 40%. No equipment will operate on slopes over 50%. All truck roads will be watered and maintained in relatively dust free condition.

Prior to the wet season, all main roads will be checked to insure full operation of road drainage and culverts. After and/or during the first significant storm, the truck roads servicing the most recently logged area will be checked a second time.

PESTS AND DISEASES

There are no known pest problems. However, the project area is located in the Coastal Pitch Canker (*Fusarium subglutinans* f. sp. *pini*) Zone of Infestation. There is a young component of Monterey pine (*Pinus radiata*) and ponderosa pine (*Pinus ponderosa*) and a larger component of Douglas-fir (*Pseudotsuga menziesii*) on the project area, which are species known to be susceptible to pine pitch canker in its natural setting. Jack Marshall, CDF entomologist, was contacted to discuss field evident symptoms (pers. comm., 1999). There is no evidence that any trees are infected with the disease. When pine is harvested, the following precautions will be taken to insure that pine pitch canker does not spread:

a) Prior to any pines being felled, the RPF will confirm where the logs will be shipped (end destination).

b) If the end destination is outside of the Coastal Pitch Canker Zone, logs uninfected with pitch canker (per RPF evaluation of standing trees and logs) will be shipped no later than seven dry days (less than ¼" of rain) following felling.

c) No bark beetle infested trees will be felled if the logs therefrom are to be transported outside of the Coastal Pitch Canker Zone of Infestation.

d) If pitch canker infected trees are located in the logging area, no pines will be shipped outside the Coastal Pitch Canker Zone of Infestation.

e) During the period February 1 through June 30, when beetle attraction to fresh pine logs is thought to be the greatest, the following mitigations will apply:
   1. The RPF will inspect standing pine trees two weeks prior to felling, which are to be shipped outside of the Zone of Infestation, the RPF will inspect standing pine trees to determine if any have pine pitch canker or have signs or symptoms of bark beetle attack. If pine trees have either pitch canker infection or bark beetle infestation, they will not be felled for the purposes of shipping outside the Zone of Infestation.
   2. Within four days prior to transporting from the logging area any pines destined to leave the Zone of Infestation, the RPF will inspect the logs on-site to determine if they have pitch canker and/or if the logs have become infested with pine engraver or other pine bark beetles. If the RPF finds that the logs are infected with pitch canker, pine logs will not be shipped outside the Zone of Infestation. If logs are shipped within four dry days of felling, the log inspection may not take place.
   3. If the RPF finds that the logs and standing trees are not infected with pitch canker, but the logs are infested with pine engraver beetles or other pine bark beetles, the RPF will ensure that each beetle-infested log is at least 95% debarked prior to being shipped outside the Zone of Infestation.

f) During the period July 1 through January 31, the following mitigations will apply:
   1. The RPF will inspect standing pine trees two weeks prior to felling, the RPF will inspect standing pine trees to determine if any have pine pitch canker or have signs or symptoms of bark beetle attack. If the trees have either pitch canker or bark beetles, they will not be felled for the purpose of shipping the logs outside of the Zone of Infestation.
   2. If the RPF finds neither pitch canker nor beetle infestation in the pine logs and does not find pitch canker in any standing trees in the logging area, the pine logs may be shipped outside the Zone of Infestation shipped within seven dry days of felling.

g) If the pine logs have not been shipped within seven dry days of felling, the logs will not be shipped outside of the Coastal Pitch Canker Zone of Infestation, unless agreed to by the Director.

h) If the RPF fails to make an evaluation of the felled pine logs and standing trees, or the plan submitter fails to retain or contract an RPF for such an evaluation, pine logs will not be shipped outside the Zone of Infestation.

i) The pine log and standing tree evaluation will be conducted by an RPF or qualified supervised designee[1].

j) Where pine slash is generated it will be considered potential brood material and treated as follows:
   1. Treatment will be completed as soon after brood material creation as is practical, but not later than one week and will apply to the entire project area.
   2. All branches will be lopped from the sides and tops of those portions of main stems, which are 3" or more in diameter.
   3. Branches will be scattered so that stems have maximum exposure to solar radiation.
   4. Brood material will not be piled.

Or

   1. Treatment will be completed within five weeks of creation during weather that is suitable for brood development and will apply to the entire project area.
   2. Slash will be piled and burned or slash will be covered with (at a minimum) 6 mil. plastic , where the piles are completely sealed by the plastic so that there are no openings to the outside and remain covered for six months (or 4 months if at least two summer months are included).

k) Per FPR 1090.7(m) the above measures will be emphasized to the LTO.

Note: The NTMP may be amended in the future should the Board of Forestry delete Mendocino County from the Coastal Pine Pitch Canker Zone of Infestation or should mitigation concepts vary due to future pitch canker research.

Red ring rot (*Phellinus pini*) has been observed in the stand, but it does not appear to be a significant problem. Conk rot will likely always be present in the stand. However, the conk tends to infect suppressed and over-mature trees, with the greatest amount of damage occurring in trees greater than 90years old. By growing Douglas-fir to less than 90 years, and by removing the suppressed and over-mature trees, the RPF believes that the fungus can be kept to a minimum.

The Douglas squirrel (i.e. chickaree) causes some top mortality in redwood. This is not a significant problem. Significant loss from black bear activity or black stain root disease has not been observed.

Insects and disease get their start through damaged, weakened, or over-crowded trees. The best prevention is to maintain a healthy vigorous stand.

FIRE

Although fire is a natural disturbance component of the ecosystem, there are no plans to use it as management tool.

Fire danger reaches extreme during the summer months. Long, dry summers, high winds and large concentrations of logging slash contribute to this problem. The area is closed to public travel, which greatly reduces the danger of man-caused fires. Roads running the perimeter of the project area serve as firebreaks from fire encroaching from the south, east or west. There is one fire lookout which could report fires in this area, the Iron Peak Lookout. Fires in this area should be reported to the California Department of Forestry by calling 911.

[1] A supervised designee who has taken a course designed for practitioners working in the Pine Pitch Canker Zone of Infestation, which includes a comprehensive field identification portion to equip practitioners with the ability to identify pine pitch canker.

OTHER GENERAL INFORMATION

Outstanding Stocking and Completion Reports

There are no outstanding stocking and completion reports. Previously, THP 1-81-357 MEN was approved. It was coupled with a CFIP plan prepared by Louisiana-Pacific Corporation in 1981. In May 1992 a SIP plan was approved and in subsequent years, it appears to have been implemented.

Silvicultural Prescription

Silvicultural prescription will be individual tree selection, including removal of small groups up to 1/4 acre in size. Group B species are not proposed for management.

General Yarding Methods

Since the first harvest in 1959, all harvesting has been accomplished by tractors and rubber tired skidders.

All of the project area will be harvested with tractors or rubber tired skidders. However, areas designated for tractor logging may be cable-logged at the professional judgement of the RPF.

Post-harvest Stocking Levels

Following harvest, average basal area will be approximately 100 square feet. However, the following minimal residual basal area levels will be present (per Section 913.2 (a) (2) (A) (2)):

Site III lands 75 square feet

Note: Small inclusions of site IV land exist, but are too small to map. The minimum post harvest basal area is lower for site IV lands.

Maximum sustained production of high quality timber products will be met by retention of at least 8 eighteen inch trees (or their equivalent) per acre within the entered areas. The leave stand will be composed of vigorous, full-crowned trees of all size classes, which exhibit the best phenotypes available within the stand.

Group B species will not be used to meet stocking.

Unstocked Areas

The Weir project area is fully stocked according to the Forest Practice Rules. No unstocked areas greater than 20 acres occur.

Flagging Prior to Operations

All flagging will be hung by the RPF or his supervised designee. Prior to Operations, the following will be flagged:

a) WLPZ/EEZ of Class I and II watercourses and springs.
b) EEZ of slide and debris flow/ torrent track at point J and C.
c) Skid trails across hummocky areas at points F and G.

Flagging Prior to Pre-Harvest Inspection

All flagging will be hung by the RPF or his supervised designee. Prior to Pre-Harvest Inspection, the following will be flagged.

a) class II and III watercourse crossings.
b) all truck roads (proposed and existing).
c) all landings (proposed and existing).
d) Points V, X and Y (i.e. in lieu skid trail).
e) special treatment area (i.e. archaeological site).

Timber Marking

All trees to be harvested will be individually marked by the RPF or his supervised designee with a horizontal paint stripe approximately 4 feet above ground level and at the base of the tree.

Forest Products

Forest products to be removed will be sawlogs, fuel-wood and chip-logs.

Special Forest Products

A brief listing of special forest products that may occur in the project area is displayed in Table 1.

Table 1. Special Forest products present in the Weir project area

Use	Common Name	Scientific Name
Floral Greens	Sword fern	*Polystichum munitum*
	Evergreen huckleberry	*Vaccinium ovatum*
	Mosses	*Isothecium spp., Hypnum spp., Neckera spp.*
Christmas greens and boughs	Douglas-fir	*Pseudotsuga menziesii*
Edibles	Huckleberries	*Vaccinium spp.*
	Berries	*Rubus spp.*
	Fiddlehead	*Pteridium aquilinum*
	Mushrooms:	
	Chantrelle	*Cantharellus cibarius*
	Morel	*Morchella spp.*
	Matsutake	*Tricholoma magnivelare*
	King bolete	*Boletus edulis*
Medicinals and herbs	Cascara	*Rhamnus purshiana*
	Stinging nettle	*Urtica diocia*

Adapted from "Special Forest Products..." by R.Molina, N.Vance, J.Weigand, D.Pilz and M.Amaranthus

Extraction of special forest products must be approached with caution so as not to deplete the population. See "Standards and Guidelines for the Harvesting of Selected Medicinal Herbs" created by Trinity Alps Botanicals (www.trinityalpsbotanicals.com).

Winter Operations

See discussion in Section 2, Winter Operations.

Certificate of Conversion

The RPF confirms that there is no Conversion Certificate in effect on this NTMP.

Downstream Domestic Water Sources

Letters were sent requesting information on domestic water supplies to all property owners within 1000 feet downstream of the project boundary. Three responses were received. None of the water sources described by the respondents will be impacted by the project. See Appendix C for a description of responses, sample of the letter, and the public notification.

Special Treatment Areas

The project area is not located within a Special Treatment Area.

Archaeology and Sensitive Species

Protection measures associated with archaeological sites are located in Appendix D (confidential Addendum). Protection measures associated with sensitive species are located in the Cumulative Impacts Analysis.

SECTION TWO

BACKGROUND

This portion of the NTMP is divided into two subsections. Each section covers one management unit, in which standing inventory, growth, yield and proposed harvest are detailed. Following this discussion, specific harvest operations are described.

The discussion of the specific harvest operations is set up similar to a standard THP. Significant points are keyed to a Harvest Operations map, which immediately precedes the write-up for each management unit. Other supporting data includes the Stand Data Summary and Erosion Hazard Rating calculations.

Field work was carried out during the fall and winter of 1999. Data was collected from a 1/5 acre fixed plot radius cruise performed by the RPF and his supervised designee(s) in preparation of this NTMP and during marking. Growth data was obtained from numerous (in excess of 100) increment borings taken during data collection.

WEST UNIT

General Unit Description

The west and east unit are separated according to property ownership. The west unit constitutes the western portion of the project area. Sections 21, 22, 27 and 28 of Township 16N and Range 15W intersect in the southern portion of the unit. There are 150 acres in this management unit.

Elevations vary from 380 to 760 feet above sea level. Aspect is generally southwesterly, except for a small area in the northern portion of this unit that faces northeast. Slopes vary from gentle to moderately steep.

Soil complexes include the Ornbaun-Zeni and the Yellowhound-Kibesillah. Timber site is site class III with small inclusions of site class IV forestland, too small to map.

Timberstand Characteristics

This second-growth even-aged forest presently supports an overstory that is dominated by redwood and to a lesser extent Douglas-fir, and pine (see Figure 2. Stand Data Summary).

Applicable to the area south of the main ridge, redwood occurs in dense clumps, spaced at varying intervals. The grassland or hardwood matrix contains scattered and dense pockets of Douglas-fir. Pine planted in 1967 is competing with some redwood clumps and Douglas-fir. Douglas-fir and pine planted in 1992 comprise the regeneration abundance in the matrix. Redwood is regenerating by coppice associated with disturbance in the clumps. In areas where pine was not planted in the matrix, hardwoods dominate the intermediate story and are often in direct competition with redwood and Douglas-fir. Although the area was clearcut and burned forty years ago, a small component of residual trees remain. These are often very defective and some are overshadowing numbers of small merchantable vigorous trees.

Applicable to the area north of the main ridge, Douglas-fir and to a lesser extent redwood dominate the overstory. This area is very dense with large numbers of suppressed Douglas-firs. Several of the Douglas-firs overshadow redwood clumps. A small area north of the ridge and along the northern property boundary is dominated by infrequently spaced redwood clumps in an extensive hardwood matrix. There is no pine in this area. Most of this area was excluded from the 1959 harvest, but was harvested in 1982.

The second-growth timber is of good quality. Tree quality and form are variable, with quality and height improving from south facing slopes to north facing slopes. As expected, timber on the flats is substantially shorter than timber occurring in the drainages or on steeper ground. The young timber stand shows little effect of previous fire, conk (*Phellinus pini*), wind or residual damage from previous logging.
The merchantable volume is dominated by small-sized sawtimber. Nearly half of the total volume occurs in trees ranging from 12 to 16 inches, while 36% of the volume is in trees 18-24"dbh (see Figure 2. Stand Data Summary).

Hardwoods are a significant component of the forest. Tanoak is the most prevalent with smaller amounts of pacific madrone and few California bays and live oaks. Tanoaks are small, averaging 6" dbh. Coexisting understory species include blue blossom, greenleaf manzanita, evergreen huckleberry and coyote brush. Bigleaf maple, Pacific wax myrtle and willow are a component in the riparian corridors.

Volume

See Stand Data Summary, Figure 2 for net sawlog volume by species and diameter class as of 1999 in the west unit.

Growth, Yield and Allowable Cut

Growth and Yield

For purposes of this NTMP, the following describe the concept of timber growth:

a) Growth is actual physical size increase. As real volume growth, it is independent of inflation and economic discount factors.

b) Standing timber volume is best thought of as principle and the growth as interest earned upon that principle.

c) Growth is calculated as simple, not compounded, interest.

The growth data indicates that the present growth rate is 6.2% per year. This high rate is due to the young age of the stand and large area of open grown young vigorous redwood clumps and younger Douglas-fir sawtimber. It is expected that this rate will decrease as the trees age and increase in size.

Based upon the total net inventory of 1,563,000 b.f., this indicates that total volume is increasing at 97,000 b.f. per year. Based upon an average per acre net volume of 10,400 b.f., the average per acre growth is 650 board feet per year over the unit.

The proposed sustained annual per acre growth goal is 800 board feet. This goal, though less than the mean annual increments calculated at 80 years by Lindquist & Palley, is realistic considering the present stocking levels and the percentage of non-redwood in the unit.

The timber stand presently is growing above the long-term percentage growth goal. The RPF intends to maintain an annual growth rate of 4% by growing more recoverable wood on fewer trees. Relative to natural stand yield tables, lower inventories will be carried in the project area, but the individual trees will be growing faster.

For example, instead of carrying 80,000 board feet per acre growing at 1%, a lower inventory of only 20,000 board feet per acre will be growing at 4%. The net growth is still 800 board feet per acre per year in each case. Furthermore, the 20,000 board foot stand is more valuable, since larger average tree size will mean more recoverable volume per tree. Additionally, logging costs will be reduced, since fewer trees will need to be cut to realize the same volume.

RPF experience on similar properties, suggests that, under proper intensive management, the 4% rate is realistic and attainable when carrying the proposed inventories.

A critical consideration in attaining these per acre growth goals is attaining near-100% stocking. This entails some minor degree of conifer planting to increase stocking in areas presently occupied by pine and grass, and thinning the stand in other areas to improve redwood spacing.

Allowable Harvest and Stocking Adjustment

Refer to Table 2, Potential Harvest Schedule.

Harvest emphasis is to be upon thinning, improvement of stand structure, and general sanitation. Pine will be eliminated and hardwoods reduced to favor redwood and Douglas-fir, pending market conditions. This will promote the objective of retaining high-quality redwood and Douglas-fir for future growth.

Consistent with management goals, this unit is capable of growing 3,000,000 board feet of commercial timber (i.e. 20,000 b.f. per acre on 150 acres). The long-term growth goal is to achieve a 4% annual rate on a never-to-be-diminished permanent base inventory (2,143,000b.f.) that is 73% higher than the present stand volume (1,563,000 b.f.).

The keys to reaching this growth goal are:

a) For five entries, including entry in 2000, harvest less than the periodic growth increment allowing the surplus volume and ingrowth to accumulate and add to the growing stock.

b) During each entry, adjust spacing, maximizing light and space to allow crop trees to attain "target" size.

c) In the first cycle, volume will be cut from redwood clumps and suppressed Douglas-firs in need of thinning. Few defective residual trees will be removed to benefit young vigorous trees, so that stand structure may improve.

d) Replace the non native pine component and reduce the hardwood component, as market conditions permit. Plant Douglas-fir and redwood in these areas.

e) It will take five entries to attain the total volume goal, at which point the long term growth rate goal will be met. Structure at this point will be desirable, but will continue to be enhanced in subsequent entries. This gradual approach is necessary to preserve aesthetics and avoid windthrow, which could result from rapid stand opening.

By harvesting less than the periodic increment, thinning/releasing young poles and small sawtimber and maintaining proper spacing, the sustained-yield production goal should be realized by the fifth harvest, in the year 2050.

At that time, a permanent base inventory of 2,143,000board feet (i.e. principle) will be growing some 857,000board feet (i.e. interest) every 10 years; this will be the long-term sustained-yield allowable cut.

Table 2. West Unit Potential Harvest Schedule (Volume in bd ft - net Scribner log scale)					
Year	Pre-harvest Volume	Harvest Volume	Post-harvest Volume	Growth-next 10 years Volume	Percent
2000	1,563,000	391,000	1,172,000	777,000	6.2
2010	1,949,000	510,000	1,439,000	822,000	5.5
2020	2,261,000	530,000	.1,731,000	779,000	4.5
2030	2,510,000	551,000	1,959,000	784,000	4
2040	2,743,000	600,000	2,143,000	857,000	4
2050	3,000,000	857,000	2,143,000	857,000	4
2060	3,000,000	SUSTAINED			
includes 50,000 b.f. ingrowth at year 2010					
includes 30,000 b.f. ingrowth at year 2020					
Note: figures may not add exactly due to rounding					

Significant Management Considerations
Major concerns in attaining management goals are:

a) Thin young redwood clumps and dense pockets of Douglas-fir---

These dense redwood clumps and young dense Douglas-fir pockets, 40 years of age have tremendous growth potential. They should be thinned from below to promote spacing and light. Dominant 16" to 20" dbh trees should be retained and the smaller suppressed and intermediate trees (12" to 16") should be removed. The initial harvest will produce many stems and a relatively small volume, but this should be viewed as an improvement cut to increase the diameter of vigorous dominant trees. These 16" to 20" dbh trees are crop trees, which insure a future supply of 28"+dbh trees to meet "target" size goals.

b) Pre-commercially thin/release young conifer thickets---

as soon as young sprouts and saplings express dominance, they should be thinned (generally at a height of 10-15 feet). This is an opportunity to emphasize redwood and Douglas-fir over hardwoods, pine and brush.

c) Replace Ponderosa pine and Monterey pine with redwood and Douglas-fir.---

where economically feasible, commercially harvest larger pine (12"+dbh); remove smaller pine by hand.

d) Minimize fire hazard---

Minimize large concentrations of logging slash. Maintain restricted vehicle access per locked gates. Remove and/ or lop slash along truck roads and around dwellings.

e) Minimize wind-related damage and growth reduction---

Maintain wind-firm trees along stand margin where stand borders grassland to insure interior stand integrity.

f) Maintain meadow aesthetics—

Maintain an intact screen around the meadow by not creating any openings along the meadows edge. Select to leave prominent trees that can be seen from the meadow.

Harvest Frequency
The long-term sustained-yield of 857,000 board feet should be removed every 10 years. This is sufficiently often to carry out remedial stand treatments and salvage mortality, but long enough to minimize aesthetic disturbance and allow release growth to accumulate.

It is imperative that harvest scheduling remain flexible to take advantage of good markets, and avoid poor ones. Depending upon market conditions, only a portion of the designated volume may be harvested in any one year. Thus, the total allowable harvest may be removed over several years, rather than in a single entry.

Regardless, the total allowable cut for any one 10-year period will not be exceeded.

Stand Structure

The conversion attempt (from forestland to grassland) in the 1959 created a small sawlog diameter age class which presently comprises the bulk of the unit volume. The young timber is a "building block" upon which the future management of the unit depends. The management of this young component is vital to the success of the uneven-aged management strategy.

The previous harvests, for all practical purposes have eliminated the mature stand component, excepting isolated pocket on the north facing slope. After the first selection entry and subsequent selection entries the stand will slowly express different age classes lending to the development of an uneven aged stand. At which point, creating adequate light for regeneration of different age classes is vital to the success of the uneven-aged management strategy.

Stand table data (see Figure 1) indicates that, in general, the unit has an adequate distribution of trees by size class in the lower size classes. As such, a "gap" in the availability of mature target-size timber will be realized in this entry and in the following two entries. In subsequent entries there will be adequate availability of mature target size timber. (A stand table graphs tree numbers vs. tree dbh on a per acre basis).

The previous conversion attempt has generated a stand table that displays a steep "inverse-J" curve, indicating a lack of larger trees (i.e. 26"+). The proposed management to grow trees to the target size will flatten the curve.

This will be accomplished by:

a) harvesting low quality trees in all age classes.

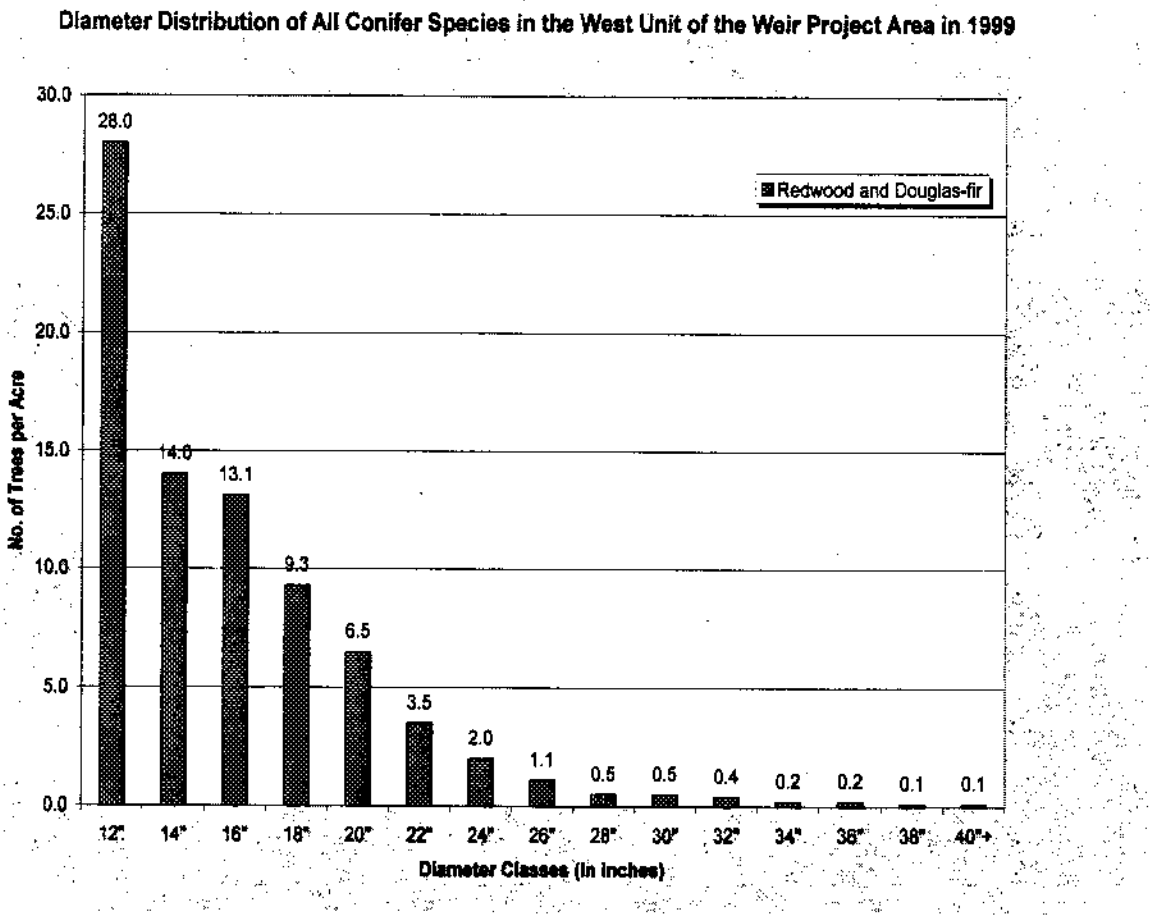
b) thinning smaller suppressed Douglas-fir and removing smaller redwood from "below".

c) retaining larger trees in each harvest, to eventually develop high-quality sawlog redwood and Douglas-fir.

Perhaps the single most critical aspect of stand management is to avoid cutting too many high quality dominant and co-dominant redwood and Douglas-fir. In general, when properly spaced, these trees (generally 20-26"dbh) should be allowed to grow.

Diameter Distribution

Figure 1. 1999 Diameter Distribution of All Conifer Species in West Unit of the Weir Project Area



Stand Data Summary

Figure 2. Stand Data Summary

Stand Data Summary

Unit: Weir - West Unit

Acres: 150

Volume

Percentage of Species by Volume

Species	RW	DF	Pine		Hardwoods (>12")
Percentage	76%	24%	negligible		similar to east unit

Percentage of Size Classes by Volume

Diam. Group	12-16"	18-24"	26-34"	36" plus
Percentage	46%	36%	15%	3%

Net Volume by Species and Diameter Group for the Unit (in scribner board feet).

Diameter Class	12"-16"	18"-24"	26"-34"	36"+	TOTAL
Redwood	528,000	418,000	206,000	36,000	1,188,000
Douglas-fir	195,000	149,000	31,000	0	375,000
Pine	negligible	negligible	negligible	negligible	negligible
TOTAL	**724,000**	**567,000**	**237,000**	**36,000**	**1,563,000**

Notes: *All figures are rounded to nearest thousand.*
Volume based upon all conifer trees 12" in diameter and larger.

Growth

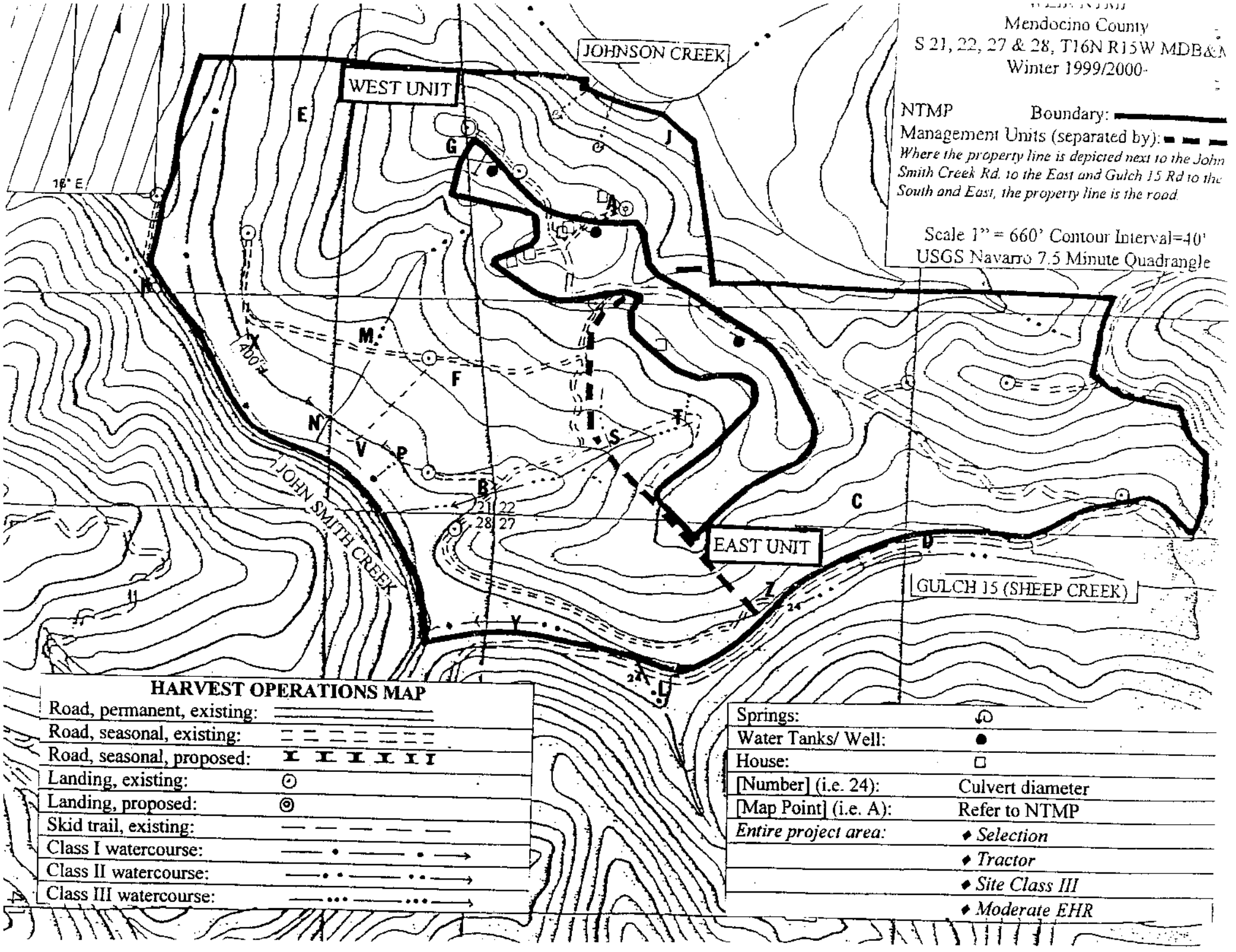
Annual Growth Rate: 6.20%

Net Growth per Acre/ year (in scribner board feet): 650 board feet/ acre/ year

Net Growth per Unit/ year (in scribner board feet): 97,000 board feet/ total/ year

Management History

Date	*Activity*	*Acres*
1959	Clear cut/ burn, conversion attempt	entire unit
1967	Plant pine	south facing slopes of unit
1982	Selection (500,000 bd ft removed)	entire unit
1992	SIP plan: discing, plant pine	south facing slopes of unit
2000	First entry under NTMP	entire unit


Mendocino County
S 21, 22, 27 & 28, T16N R15W MDB&M
Winter 1999/2000
NTMP Boundary:
Management Units (separated by):
Where the property line is depicted next to the John Smith Creek Rd. to the East and Gulch 15 Rd to the South and East, the property line is the road.
Scale 1" = 660' Contour Interval=40'
USGS Navarro 7.5 Minute Quadrangle
JOHNSON CREEK
WEST UNIT
EAST UNIT
JOHN SMITH CREEK
GULCH 15 (SHEEP CREEK)
400'
21 22
28 27
HARVEST OPERATIONS MAP
Road, permanent, existing:
Road, seasonal, existing:
Road, seasonal, proposed:
Landing, existing:
Landing, proposed:
Skid trail, existing:
Class I watercourse:
Class II watercourse:
Class III watercourse:
Springs:
Water Tanks/ Well:
House:
[Number] (i.e. 24): Culvert diameter
[Map Point] (i.e. A): Refer to NTMP
Entire project area:
Selection
Tractor
Site Class III
Moderate EHR

SPECIFIC HARVEST OPERATIONS

Truck Road and Landing System
Although the greater part of the road network associated with this unit is rocked, it is unlikely that it would be able to support continual truck traffic during the winter. Thus, this road network is seasonal. All of the truck roads are located on gentle ground with gentle pitches. Currently, the roads are drained by a combination of outsloped stretches and inside ditches outleted through relief culverts. Drainage could be greatly improved by the installation of rolling dips and enhancement of the outsloping. The existing road system is in relatively good shape.

All roads and landings exist as part of the current road network, except a short spur from an existing truck road (point A), and one proposed landing at the end of this segment. Although no landings exceed 1/4 acre in size or require substantial excavation, they are mapped on the Harvest Operations map to benefit the LTO. All truck roads and landings will be flagged prior to the pre-harvest inspection.

Long stretches of Sheep Creek Road and John Smith Creek Road occur within the WLPZ. See "Existing Truck Road in WLPZ" for further discussion.

The following descriptions correspond to points designated on the Harvest Operations map.

- *Entire road network*: Supplement existing drainage of the road network by install rolling dips and outsloping road.
- *Point A*: Approximately, 300 feet of existing skid road will be upgraded to a truck road. Located on the upper portions of a gently sloping ridge, there will be no substantial construction. Only vegetation removal and very minor blading and drainage improvement will be required. The proposed spur from an existing ranch road extends across approximately 200' of meadow and into the forest, where it connects with an existing network of skid trails. A landing is proposed at the end of this segment.

Existing Truck Road in WLPZ (Results of Field Examination)
Rule § 916.4(a) states:
.....As part of this field examination, the RPF or supervised designee shall evaluate areas near watercourses lakes for sensitive conditions including, but not limited to use of existing roads within the standard WLPZ width.....The RPF shall consider these conditions when proposing WLPZ widths and protection measures. The plan shall identify such conditions where they may interact with proposed timber operations to significantly and adversely affect the beneficial uses of water and shall describe measures to protect the beneficial uses of water.
Portions of Sheep Creek Road (approximately 2000 ft) and John Smith Creek Road (approximately 2500 feet) that form the southern and western boundaries of the project area are within the WLPZ. This road network has been used since the 1950s, shows no signs of instability is in good condition and has a well rocked surface. Subsequent to operations any areas, where the rock has been removed due to activity, will be rerocked to the original surface depth. Considering the stability of the existing rocked road and the mitigation that will be applied subsequent to operations, the beneficial uses of water will not be undermined.

Appurtenant Roads
There are no appurtenant roads.

Haul Road Network
The Weir family has legal ingress/egress on Sheep Creek Road to Orr Springs Road. At least minor improvements (i.e. grading), will be made to this road prior to use by truck traffic. Use of the Mendocino Redwood Company (MRC) haul road system is subject to permission granted by MRC.

Unstable Areas

Several unstable were identified. See Unstable Areas map.

- *Point E*: This point is associated with a debris slide slope. John Schlosser, DMG geologist (pers. comm., 1999), stated that placing fill or removing critical root support can contribute to the inherent instability of the area. Management under the NTMP will not adversely impact this area as no new skid trails will be installed. All skid trails are existing, skid trail use on existing trails will be limited to the ridges and stable offshoots. Root support will not be undermined given the light selection prescribed and lack of site preparation.
- *Points F, and G*: These points are associated with disrupted ground. John Schlosser, DMG geologist (pers. comm., 1999), recommended walking the ground and adapting management to the terrain, in particular placement of skid trails. Consequently, skid trails will be flagged by the RPF or supervised designee in these areas prior to operations.
- *Points J*: This point is associated with a slide. The perimeter of the slide area will be flagged with EEZ flagging (prior to operations), in which no heavy equipment will be allowed to operate.

Yarding Methods

Tractors and rubber-tire skidders will be used to log the entire unit. Most of the ground on which tractors will operate is gently sloping. A comprehensive skid road network exists. However, not all skid roads will be reused given their proximity to watercourses, numerous crossings and occurrence on steep slopes. Exceptions include skid trails that extend into the WLPZ (see tractor operations in WLPZ, this section). Given coho considerations, no new trails will be constructed on slopes greater than 40% and no equipment will operate on slopes over 50%. Long lining will often be employed in support of this intention. At the discretion of the RPF, where deflection is adequate, cable yarding may be employed.

Tractor Operations in WLPZ (In Lieu Practice)

The standard rule states (§ 916.3(c)): *The timber operator shall not construct or reconstruct roads, construct or use tractor roads or landings in Class I, II, III or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the THP by the RPF, and approved by the Director.* Two short segments of existing skid trail (Points V and X), less than 100' in each case are proposed for use. Another long segment of existing trail (Point Y, approximately 600 feet) is proposed for use. The proposed practice is different than the standard practice as these segments of existing skid trail are located in the WLPZ. The trails associated with Points V and X, were used in the most recent harvest activities and none (Point Y included) show signs of instability and are in good condition. Additionally trails associated with points V and X are situated in the upper portion of the WLPZ away from the creek. The alternative to using segments V and X is to build a new skid trail higher on the slope. Building a new trail would require additional cutting on a moderate slope and soil movement. Cable logging is not an alternative as the topography is too gentle to support it. The area and volume, which would be removed from these portions of the trail is relatively small, 10,000 board feet per entry. At Point Y, the only alternative to using it is not to log this area, as the trail proposed for use is the only legal access into the area. The trail proposed for use is the old Sheep Creek Road. It is a full bench road in stable condition. As the road forms the project area boundary and the road is within the WLPZ, a non WLPZ trail is not a feasible legal alternative as it would be situated off the property. Cable logging this area is not possible as the topography in this area is too gentle. It is not an acceptable alternative to the landowner to leave this area inaccessible. This section of trail will not be used in the first entry. In subsequent entries it will be used to remove only a small volume, approximately 10,000 board feet per entry.

Subsequent to operations, segments of trails that occur in the WLPZ will be scattered with slash, which will be walked in using a tractor or seeded and mulched per Section I, Seeding. Considering the stability of the existing trails, the mitigation that will be applied subsequent to operations, the short distance for which points V and X are in the WLPZ, and the low volume that they will support, the protection provided by the proposed practice is at least equal to the protection provided in the standard rule. This trail will be flagged prior to the pre-harvest inspection and the LTO will be shown these points prior to operations.

Watercourse Protection

The following watercourse protection will be employed on the NTMP:

Table 3. Watercourse Protection Widths

	Water Class		
Slope	**WLPZ Class I width in feet**	**WLPZ Class II width in feet**	**ELZ Class III width in feet**
<30%	75	50	25
30-50%	100	75	50
>50%	150 (100 cable)	100 (75 cable)	50

Class I

- John Smith Creek
- The lower 300 feet of Gulch 15 (Sheep Creek)
  a) WLPZ 75-100 feet, slopes <30 to >50% (see Table 3).
  b) Protective measures:
     1. Prior to operations, WLPZ will be flagged. Prior to the pre-harvest inspection, trees within WLPZ will be marked. This will be done by the RPF or his supervised designee.
     2. In the first 25 feet (measured from the transitional zone), at least, 85% of the existing overstory and understory canopy, will be retained undisturbed, at least 50% of which will be composed of existing overstory conifers. In the balance of the WLPZ, at least, 70% of the existing overstory and understory canopy, will be retained undisturbed, at least 50% of which will be composed of existing overstory conifers. The overstory and understory will be left in the same species and size class distribution as currently exists. Additionally, at least, 75% of the surface cover will remain undisturbed.
     3. All existing embedded trees, large wood pieces or other woody material that presently. function to store and/or meter sediment into downstream waters shall be retained.
     4. All trees that lean toward, across or are undercut by class I and II watercourses will be retained.
     5. Snags will be retained.
     6. Water intakes to drafting mechanisms will be screened and the rate at which drafting/diversion occurs will be adjusted to insure no visible drop in the water surface downstream of the intake/diversion point.
  c) No class I crossings exist within the unit.

Note: Less than 15% of the timber volume will be removed from the WLPZ. This extremely light harvest will leave ample sources of future LWD.

Class II

- Gulch 15 (Sheep Creek) that flows into John Smith Creek
- Johnson Creek that flows into John Smith Creek
- The lower 150 ft of an unnamed tributary that flows into John Smith Creek
- An unnamed tributary that flows into Gulch 15
  a) WLPZ 50-100 feet, slopes <30 to >50% (see Table 3).
  b) Protective measures:
     1. Prior to operations, WLPZ will be flagged. Prior to the pre-harvest inspection, trees within WLPZ will be marked. This will be done by the RPF or his supervised designee.
     2. Crossings flagged prior to pre-harvest inspection.
     3. In the first 25 feet (measured from the transitional zone), at least, 75% of the existing overstory and understory canopy, will be retained undisturbed, at least 50% of which will be composed of existing overstory conifers. In the balance of the WLPZ, at least, 60% of the existing overstory and understory canopy, will be retained undisturbed, at least 25% of which will be composed of existing overstory conifers. The overstory and understory will be left in the same species and size class distribution as currently exists. Additionally, at least, 75% of the surface cover will remain undisturbed.
     4. All existing embedded trees, large wood pieces or other woody material that presently function to store and/or meter sediment into downstream waters shall be retained.

5. All trees that lean toward across or undercut by class I and II watercourses will be retained.
6. Snags will be retained.
7. Approaches to all watercourse crossing will be stabilized per section 1, seeding prior to October 15 or 10 days after creation if disturbed after October 15.

c) Two Class II Crossings Exist:
   1. *Point K*: A Humboldt crossing exists at this point, on the John Smith Creek haul road network. Water is conducted under the road via this structure. It appears stable and will be used in its present condition.
   2. *Point L*: A 24" culvert exists at this point, on the Sheep Creek Road network. It is stable and will be used in its present condition.

Note: Less than 15% of the timber volume will be removed from the WLPZ. This extremely light harvest will leave ample sources of future LWD.

Class III

- several are present
  a) ELZ 25-50 feet, slopes <30 to >30% (see Table. 3)
  b) Protective measures:
     1. Equipment will be operated only at RPF-designated crossings, within the ELZ. These crossings will be designated prior to the pre-harvest inspection..
     2. All timber will be base-marked by RPF or his supervised designee prior to operations.
     3. At least, 50% of the understory vegetation will be left living and well distributed in the ELZ. Additionally, at least, 75% of the surface cover will remain undisturbed.
     4. All existing embedded trees, large wood pieces or other woody material that presently function to store and/or meter sediment into downstream waters shall be retained.
     5. Soil deposited will be removed and debris stabilized prior to October 15.
     6. All temporary crossings will be dipped out, with banks laid back at such an angle that no loose soil is able to enter the watercourse prior to October 15 or 10 days after creation if disturbed after October 15.
  c) Several class III watercourse crossings exist:
     1. *Point B*: A 4' extension will be added to the existing 24" culvert.
     2. *Points M, N and P*: These crossing will be reused. There are permanent culverts at these locations, these culverts will remain in place after operations are complete.

Springs

- Two springs exist.

  The springs will be afforded the protection detailed below.
  a) EEZ 25 feet, except where located near a road or trail, where the edge of the road or trail will be the edge of the EEZ boundary.
  b) Protective measures:
     1. EEZ flagged on ground prior to operations.
     2. All timber will be base-marked by RPF or his supervised designee prior to operations.
     3. All existing embedded trees, large wood pieces or other woody material that presently function to store and/or meter sediment into downstream waters shall be retained.

Domestic Water Source

No domestic water sources exist within the unit boundaries or have the potential to be impacted by project activities.

Water Tanks and Wells

See Harvest Operations map for location. These features are located outside of the unit boundaries.

Winter Operations

During the period from 15 October to 15 November and from 1 April to 1 May, the following shall apply:

a) Tractor use shall occur only during dry, rainless periods where soils are not saturated.
b) Waterbars and/or rolling dips shall be installed prior to the end of the day if 30% chance of rain is predicted, and on weekends.

During the "winter period" 15 November to 1 April. The only winter operations will be timber falling. Falling will occur under the following conditions:

a) Falling can occur at anytime during the winter season, except in the WLPZ or in unstable areas.
b) Pick-up truck access on non-rocked roads will be limited to extended dry periods where no road surface rutting will occur. Otherwise, fallers must enter the area on foot or by using an all-terrain vechicle.

Hazard Reduction

Woody debris created by timber operations greater than one inch, but less than eight inches in diameter, within 100 ft of several dwellings maintained for human habitation in the unit will be removed. Slash created within 100 ft to 200 ft of these dwellings will be lopped or piled and burned.

To further reduce fire hazard and improve aesthetics, all slash within 100 feet or in the line of sight of all roads, main skid trails, and landings will be lopped or bulldozer-crushed to within 30" of the ground. Incidental hardwoods (>7"dbh), near roads and landings, which are damaged during operations will be lopped or skidded to landings. Landing slash will be spread and/or piled as directed by the RPF. Any burning will be the responsibility of the landowner. Also see section I, Pests and Diseases for treatment of slash.

Slash to be piled and burned will be treated no later than April 1 of the year following its creation.

EROSION HAZARD RATING

Surface Erosion Hazard is moderate throughout the NTMP.

ESTIMATED SURFACE SOIL EROSION HAZARD
RM-87 (4/84)

STATE OF CALIFORNIA
BOARD OF FORESTRY

I. SOIL FACTORS O-Z = Ornbaun-Zeni complex; 130 = 9-30% slope; 131 = 30-50% slope; 132 = 50-75%				FACTOR RATING BY AREA		
A. SOIL TEXTURE	Fine	Medium	Coarse	O-Z 130	O-Z 131	O-Z 132
1. DETACHABILITY	Low	Moderate	High			
Rating	1-9	10-18	19-30	18	18	18
2. PERMEABILITY	Slow	Moderate	Rapid			
Rating	5-4	3-2	1	2	2	2
B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK						
	Shallow	Moderate	Deep			
Rating	1"-19"	20"-39"	40"-60" (+)			
	15-9	8-4	3-1	3	3	3
C. PERCENT SURFACE COARSE FRAGMENTS GREATER THAN 2 MM IN SIZE INCLUDING ROCKS OR STONES						
	Low	Moderate	High			
Rating	(-) 10-39%	40-70%	71-100%			
	10-6	5-3	2-1	10	10	10

	FACTOR RATING BY AREA		
	O-Z 130	O-Z 131	O-Z 132
SUBTOTAL	33	33	33

II. SLOPE FACTOR

Slope	5-15%	16-30%	31-40%	41-50%	51-70%	71-80% (+)			
Rating	1-3	4-6	7-10	11-15	16-25	26-35	3	11	18

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE

	Low	Moderate	High			
Rating	0-40%	41-80%	81-100%			
	15-8	7-4	3-1	3	3	3

IV. TWO-YEAR, ONE-HOUR RAINFALL INTENSITY (Hundredths Inch)

	Low	Moderate	High	Extreme			
Rating	(-) 30-39	40-59	60-69	70-80 (+)			
	1-3	4-7	8-11	12-15	11	11	11
				TOTAL SUM OF FACTORS	50	58	65

EROSION HAZARD RATING						
<50	50-65	66-75	>75			
LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)			
			THE DETERMINATION IS	M	M	M

ESTIMATED SURFACE SOIL EROSION HAZARD
RM-87 (4/84)

STATE OF CALIFORNIA
BOARD OF FORESTRY

I. SOIL FACTORS Y-K = Yellowhound-Kibesillah complex; 352 = 50-75%				FACTOR RATING BY AREA		
A. SOIL TEXTURE	Fine	Medium	Coarse	Y-K 352		
1. DETACHABILITY	Low	Moderate	High			
Rating	1-9	10-18	19-30	17		
2. PERMEABILITY	Slow	Moderate	Rapid			
Rating	5-4	3-2	1	2		
B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK						
	Shallow	Moderate	Deep			
Rating	1"-19"	20"-39"	40"-60" (+)			
	15-9	8-4	3-1	3		
C. PERCENT SURFACE COARSE FRAGMENTS GREATER THAN 2 MM IN SIZE INCLUDING ROCKS OR STONES						
	Low	Moderate	High			
Rating	(-) 10-39%	40-70%	71-100%			
	10-6	5-3	2-1	7		
				SUBTOTAL	29	

II. SLOPE FACTOR									
Slope	5-15%	16-30%	31-40%	41-50%	51-70%	71-80% (+)			
Rating	1-3	4-6	7-10	11-15	16-25	26-35	22		

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE						
	Low	Moderate	High			
Rating	0-40%	41-80%	81-100%			
	15-8	7-4	3-1	3		

IV. TWO-YEAR, ONE-HOUR RAINFALL INTENSITY (Hundredths Inch)							
	Low	Moderate	High	Extreme			
Rating	(-) 30-39	40-59	60-69	70-80 (+)			
	1-3	4-7	8-11	12-15	11		
				TOTAL SUM OF FACTORS	65		

EROSION HAZARD RATING							
	<50	50-65	66-75	>75			
	LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)			
				THE DETERMINATION IS	M		

EAST UNIT

General Unit Description

The west and east unit are separated according to property ownership. The east unit, located in sections 22 and 27 of Township 16N and Range 15W, constitutes the eastern portion of the project area. There are 88 acres in this management unit.

Elevations vary from 380 to 760 feet above sea level. Aspect is generally southerly, except for a small area in the northern portion of this unit that faces north. Slopes vary from gentle to moderately steep.

Soil complexes include the Ornbaun-Zeni and the Comptche-Zeni. Timber site is site class III with small inclusions of site class IV forestland, too small to map.

One small rock pit is located in this management unit. It is expected to support ongoing non-commercial use.

Timberstand Characteristics

This second-growth even-aged forest presently supports an overstory that is dominated by redwood and Douglas-fir. A very small component of pine exists in the overstory. See Figure 2. Stand Data Summary.

Applicable to the area south of the main ridge, redwood occurs in dense clumps, spaced at varying intervals. The hardwood and to a lesser extent grassland dominated matrix contains scattered and dense pockets of Douglas-fir. Pine planted in 1967 is competing with only a small portion of redwood clumps and Douglas-fir. Douglas-fir comprises the regeneration abundance in the matrix. Redwood is regenerating by coppice associated with disturbance in the clumps. Hardwoods dominate the intermediate story and are often in direct competition with redwood and Douglas-fir. For all practical purpose no residual trees remain due to the conversion attempt forty years ago and the subsequent logging in 1982.

Applicable to the area north of the main ridge, Douglas-fir and to a lesser extent redwood dominate the overstory. The stand is much denser than that which is supported by the southern exposure. Several of the Douglas-firs overshadow redwood clumps. Small areas north of the ridge support a hardwood matrix with an overstory of infrequently spaced redwood clumps and scattered Douglas-fir. There is no pine in this area. For all practical purpose no residual trees remain due to the conversion attempt forty years ago and the subsequent logging in 1982.

The second-growth timber is of good quality. Tree quality and form are variable, with quality and height improving from south facing slopes to north facing slopes. As expected, timber on the flats is substantially shorter than timber occurring in the drainages or on steeper ground. The young timber stand shows little effect of previous fire, conk (*Phellinus pini*), wind or residual damage from previous logging.
The merchantable volume is dominated by small-sized sawtimber. Over half of the total volume occurs in trees ranging from 12 to 16 inches, while 32% of the volume is in trees 18-24"dbh (see Figure 4. Stand Data Summary).

Hardwoods are a significant component of the forest. Tanoak is the most prevalent with smaller amounts of pacific madrone live oaks and California bays. Tanoaks are small, averaging 6" dbh. Coexisting understory species include blue blossom, greenleaf manzanita, evergreen huckleberry and coyote brush. Bigleaf maple, Pacific wax myrtle and willow are a component in the riparian corridors.

Volume

See Stand Data Summary, Figure 4 for net sawlog volume by species and diameter class as of 1999 in unit.

Growth, Yield and Allowable Cut

Growth and Yield

For purposes of this NTMP, the following describe the concept of timber growth:

a) Growth is actual physical size increase. As real volume growth, it is independent of inflation and economic discount factors.

b) Standing timber volume is best thought of as principle and the growth as interest earned upon that principle.

c) Growth is calculated as simple, not compounded, interest.

The growth data indicates that the present growth rate is 6.2% per year. This high rate is due to the young age of the stand and large area of open grown young vigorous redwood clumps and younger Douglas-fir sawtimber. It is expected that this rate will decrease as the trees age and increase in size.

Based upon the total net inventory of 678,000 b.f., this indicates that total volume is increasing at 42,000 b.f. per year. Based upon an average per acre net volume of 7,700 b.f., the average per acre growth is 480 board feet per year over the unit.

The proposed sustained annual per acre growth goal is 700 board feet. This goal, though less than the mean annual increments calculated at 80 years by Lindquist & Palley, is realistic considering the present stocking levels and the percentage of non-redwood in the unit.

The timber stand presently is growing above the long-term percentage growth goal. The RPF intends to maintain an annual growth rate of 4% by growing more recoverable wood on fewer trees. Relative to natural stand yield tables, lower inventories will be carried in the unit, but the individual trees will be growing faster.

For example, instead of carrying 70,000 board feet per acre growing at 1%, a lower inventory of only 17,500 board feet per acre will be growing at 4%. The net growth is still 700 board feet per acre per year in each case. Furthermore, the 17,500 board foot stand is more valuable, since larger average tree size will mean more recoverable volume per tree. Additionally, logging costs will be reduced, since fewer trees will need to be cut to realize the same volume.

RPF experience on similar properties, suggests that, under proper intensive management, the 4% rate is realistic and attainable when carrying the proposed inventories.

A critical consideration in attaining these per acre growth goals is attaining near-100% stocking. This entails some minor degree of conifer planting to increase stocking in areas presently occupied by hardwoods, pine and grass, and thinning the stand in other areas to improve redwood spacing.

Allowable Harvest and Stocking Adjustment

Refer to Table 4, Potential Harvest Schedule.

Harvest emphasis is to be upon thinning, improvement of stand structure, and general sanitation. Pine will be eliminated and hardwoods reduced to favor redwood and Douglas-fir, pending market conditions. This will promote the objective of retaining high-quality redwood and Douglas-fir for future growth.

Consistent with management goals, this unit is capable of growing 1,540,000 board feet of commercial timber (i.e. 17,500 b.f. per acre on 88 acres). The long-term growth goal is to achieve a 4% annual rate on a never-to-be-diminished permanent base inventory (1,105,000b.f.) that is 61% higher than the present stand volume (678,000 b.f.).

The keys to reaching this growth goal are:

a) For five entries, including entry in 2000, harvest less than the periodic growth increment allowing the surplus volume and ingrowth to accumulate and add to the growing stock.

b) During each entry, adjust spacing, maximizing light and space to allow crop trees to attain "target" size.

c) In the first cycle, volume will be cut from redwood clumps and suppressed Douglas-firs in need of thinning.

d) Replace the non native pine component and reduce the hardwood component, as market conditions permit. Plant Douglas-fir and redwood in these areas.

e) It will take five entries to attain the total volume goal, at which point the long term growth rate goal will be met. Structure at this point will be desirable, but will continue to be enhanced in subsequent entries. This gradual approach is necessary to preserve aesthetics and avoid windthrow, which could result from rapid stand opening.

By harvesting less than the periodic increment, thinning/releasing young poles and small sawtimber and maintaining proper spacing, the sustained-yield production goal should be realized by the fifth harvest, in the year 2050.

At that time, a permanent base inventory of 1,105,000 board feet (i.e. principle) will be growing some 442,000board feet (i.e. interest) every 10 years; this will be the long-term sustained-yield allowable cut.

Table 4. East Unit Potential Harvest Schedule (Volume in bd ft - net Scribner log scale)					
Year	Pre-harvest Volume	Harvest Volume	Post-harvest Volume	Growth-next 10 years Volume	Percent
2000	678,000	150,000	528,000	377,000	6.2
2010	905,000	200,000	705,000	418,000	5.5
2020	1,123,000	250,000	873,000	393,000	4.5
2030	1,266,000	270,000	996,000	399,000	4
2040	1,395,000	290,000	1,105,000	442,000	4
2050	1,547,000	442,000	1,105,000	442,000	4
2060	1,547,000	SUSTAINED			
Includes 50,000 b.f. ingrowth at year 2010					
Includes 30,000 b.f. ingrowth at year 2020					
Note: figures may not add exactly due to rounding					

Significant Management Considerations
Major concerns in attaining management goals are:

a) Thin young redwood clumps and dense pockets of Douglas-fir---

These dense redwood clumps and young dense Douglas-fir pockets, 40 years of age have tremendous growth potential. They should be thinned from below to promote spacing and light. Dominant 16" to 20" dbh trees should be retained and the smaller suppressed and intermediate trees (12" to 16") should be removed. The initial harvest will produce many stems and a relatively small volume, but this should be viewed as an improvement cut to increase the diameter of vigorous dominant trees. These 16" to 20" dbh trees are crop trees, which insure a future supply of 28"+dbh trees to meet "target" size goals.

b) Pre-commercially thin/release young conifer thickets---

as soon as young sprouts and saplings express dominance, they should be thinned (generally at a height of 10-15 feet). This is an opportunity to emphasize redwood and Douglas-fir over hardwoods, pine and brush.

c) Replace Ponderosa pine and Monterey pine with redwood and Douglas-fir.---

where economically feasible, commercially harvest larger pine (12"+dbh); remove smaller pine by hand.

d) Minimize fire hazard---

Minimize large concentrations of logging slash. Maintain restricted vehicle access per locked gates. Remove and/ or lop slash along truck roads and around dwellings.

e) Minimize wind-related damage and growth reduction---

Maintain wind-firm trees along stand margin where stand borders grassland to insure interior stand integrity.

f) Maintain meadow aesthetics---

Maintain an intact screen around the meadow by not creating any openings along the meadows edge. Select to leave prominent trees that can be seen from the meadow.

Harvest Frequency
The long-term sustained-yield of 442,000 board feet should be removed every 10 years. This is sufficiently often to carry out remedial stand treatments and salvage mortality, but long enough to minimize aesthetic disturbance and allow release growth to accumulate.

It is imperative that harvest scheduling remain flexible to take advantage of good markets, and avoid poor ones. Depending upon market conditions, only a portion of the designated volume may be harvested in any one year. Thus, the total allowable harvest may be removed over several years, rather than in a single entry.

Regardless, the total allowable cut for any one 10-year period will not be exceeded.

Stand Structure

The conversion attempt (from forestland to grassland) in the 1959 created a small sawlog diameter age class which presently comprises the bulk of the unit volume. The young timber is a "building block" upon which the future management of the unit depends. The management of this young component is vital to the success of the uneven-aged management strategy.

The previous harvests, for all practical purposes have eliminated the mature stand component. After the first selection entry and subsequent selection entries the stand will slowly express different age classes lending to the development of an uneven aged stand. At which point, creating adequate light for regeneration of different age classes is vital to the success of the uneven-aged management strategy.

Stand table data (see Figure 1) indicates that, in general, the unit has an adequate distribution of trees by size class in the lower size classes. As such, a "gap" in the availability of mature target-size timber will be realized in this entry and in the following two entries. In subsequent entries there will be adequate availability of mature target size timber. (A stand table graphs tree numbers vs. tree dbh on a per acre basis).

The previous conversion attempt has generated a stand table that displays a very steep "inverse-J" curve, indicating a lack of larger trees (i.e. 26"+). The proposed management to grow trees to the target size will flatten the curve.

This will be accomplished by:

a) harvesting low quality trees in all age classes.

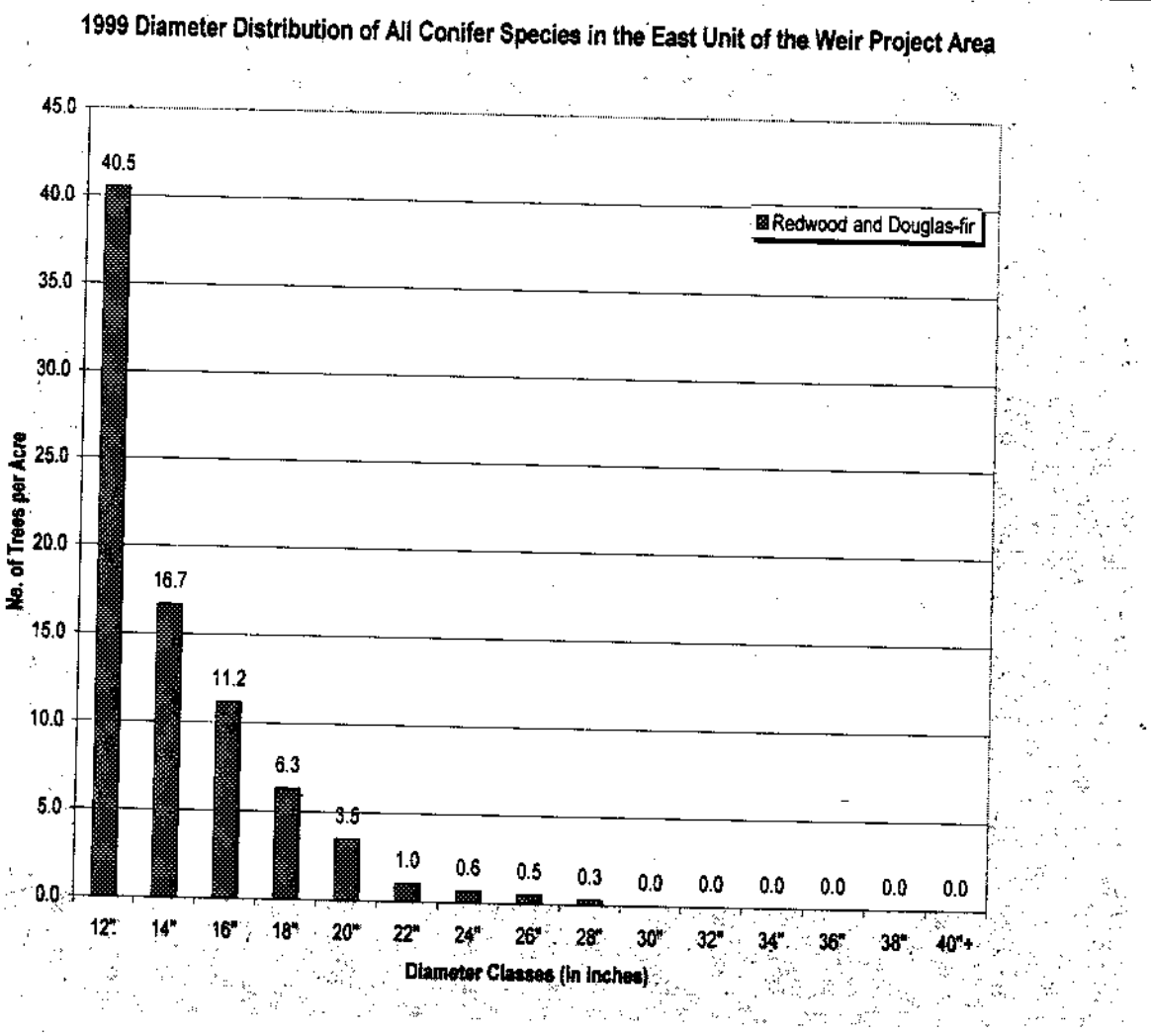
b) thinning smaller suppressed Douglas-fir and removing smaller redwood from "below".

c) retaining larger trees in each harvest, to eventually develop high-quality sawlog redwood and Douglas-fir.

Perhaps the single most critical aspect of stand management is to avoid cutting too many high quality dominant and co-dominant redwood and Douglas-fir. In general, when properly spaced, these trees (generally 20-26"dbh) should be allowed to grow.

Diameter Distribution

Figure 3. 1999 Diameter Distribution of All Conifer Species in East Unit of the Weir Project Area



Stand Data Summary

Figure 4. Stand Data Summary

Stand Data Summary

Unit: Weir - East Unit

Acres: 88

Volume

Percentage of Species by Volume

Species	RW	DF	Pine		Hardwoods (>12")
Percentage	56%	44%	negligible		122 c.f./acre (net)

Percentage of Size Classes by Volume

Diam. Group	12-16"	18-24"	26-34"	36" plus
Percentage	64%	32%	4%	0%

Net Volume by Species and Diameter Group for the Unit (in scribner board feet).

Diameter Class	12"-16"	18"-24"	26"-34"	36"+	TOTAL
Redwood	256,000	107,000	14,000	0	377,000
Douglas-fir	177,000	108,000	16,000	0	301,000
Pine	negligible	negligible	negligible	negligible	negligible
TOTAL	**433,000**	**215,000**	**30,000**	**0**	**678,000**

Notes: *All figures are rounded to nearest thousand.*
Volume based upon all conifer trees 12" in diameter and larger.

Growth

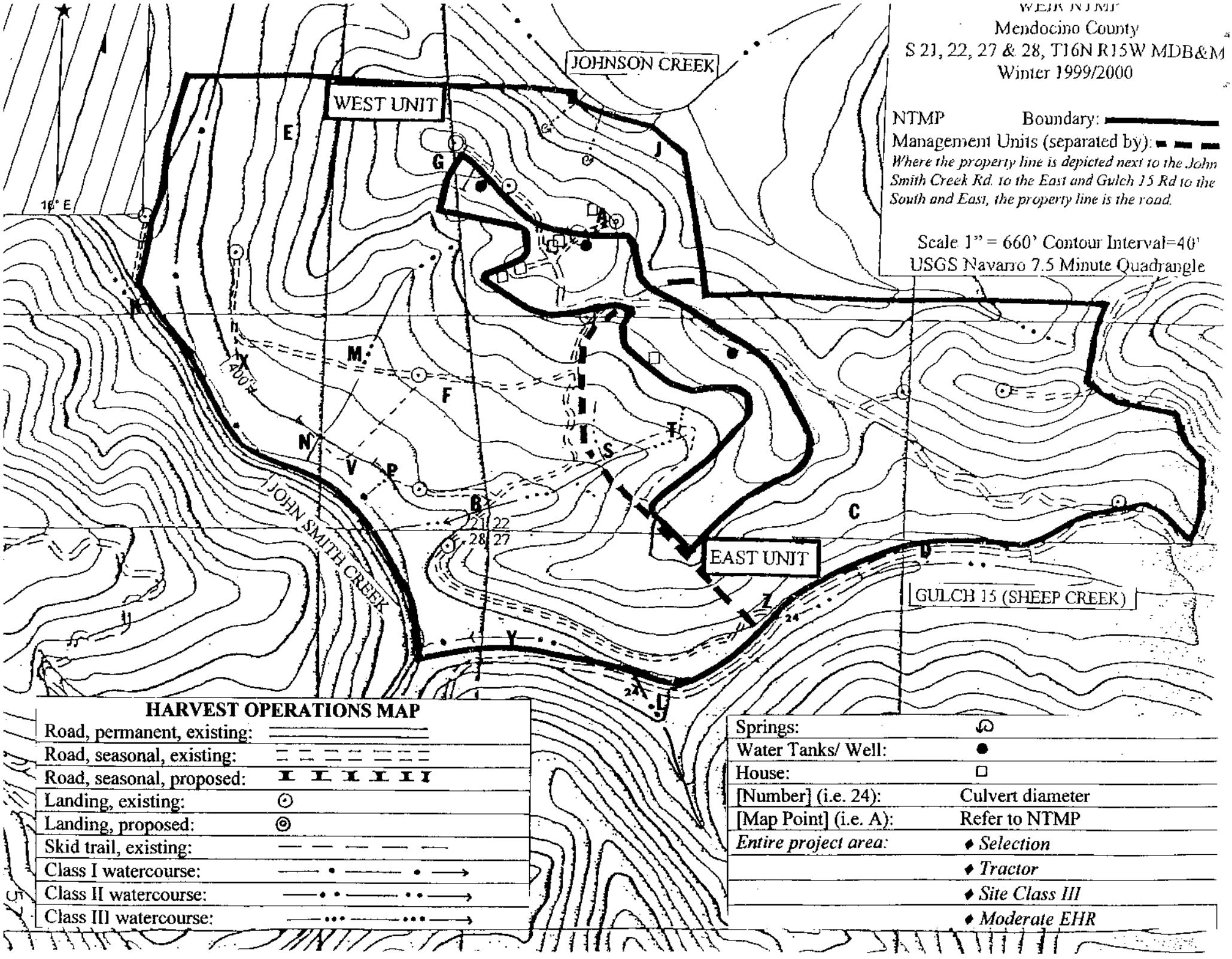
Annual Growth Rate: 6.20%

Net Growth per Acre/ year (in scribner board feet): 480 board feet/ acre/ year

Net Growth per Unit/ year (in scribner board feet): 42,000 board feet/ total/ year

Management History

Date	*Activity*	*Acres*
1959	Clear cut/ burn, conversion attempt	entire unit
1967	Plant pine	small area (west boundary)
1982	Selection (500,000 bd ft removed)	entire unit
2000	First entry under NTMP	entire unit



Mendocino County
S 21, 22, 27 & 28, T16N R15W MDB&M
Winter 1999/2000

NTMP Boundary:
Management Units (separated by):
Where the property line is depicted next to the John Smith Creek Rd. to the East and Gulch 15 Rd to the South and East, the property line is the road.

Scale 1" = 660' Contour Interval=40'
USGS Navarro 7.5 Minute Quadrangle

HARVEST OPERATIONS MAP

Road, permanent, existing:	
Road, seasonal, existing:	
Road, seasonal, proposed:	
Landing, existing:	⊙
Landing, proposed:	◎
Skid trail, existing:	
Class I watercourse:	
Class II watercourse:	
Class III watercourse:	

Springs:	ᔓ
Water Tanks/ Well:	●
House:	□
[Number] (i.e. 24):	Culvert diameter
[Map Point] (i.e. A):	Refer to NTMP
Entire project area:	♦ *Selection*
	♦ *Tractor*
	♦ *Site Class III*
	♦ *Moderate EHR*

SPECIFIC HARVEST OPERATIONS

Truck Road and Landing System
Although the greater part of the road network associated with this unit is rocked, it is unlikely that it would be able to support continual truck traffic during the winter. Thus, this road network is seasonal. All of the truck roads are located on gentle ground with gentle pitches. Currently, the roads are drained by a combination of outsloped stretches and inside ditches outleted through relief culverts. Drainage could be greatly improved by the installation of rolling dips and enhancement of the outsloping. The existing road system is in relatively good shape.

All roads and landings exist as part of the current road network. Although no landings exceed 1/4 acre in size or require substantial excavation, they are mapped on the Harvest Operations map to benefit the LTO. All truck roads and landings will be flagged prior to the pre-harvest inspection.

All permanent culvert sizing was calculated for a 50 year storm flow, based upon the Rational Formula as described in the Forest and Ranch Roads Handbook.

Long stretches of Sheep Creek Road occur within the WLPZ. See "Existing Truck Road in WLPZ" for further discussion.

The following descriptions correspond to points designated on the Harvest Operations map.
- *Entire road network*: Supplement existing drainage of the road network by install rolling dips and outsloping road.
- *Point D*: A rocked rolling dip will be installed.

Existing Truck Road in WLPZ (Results of Field Examination)
Rule § 916.4(a) states:
.....As part of this field examination, the RPF or supervised designee shall evaluate areas near watercourses lakes for sensitive conditions including, but not limited to use of existing roads within the standard WLPZ width.....The RPF shall consider these conditions when proposing WLPZ widths and protection measures. The plan shall identify such conditions where they may interact with proposed timber operations to significantly and adversely affect the beneficial uses of water and shall describe measures to protect the beneficial uses of water.
Portions of Sheep Creek Road (approximately 2000 ft) that form the southern boundary of the project area are within the WLPZ. This road network has been used since the 1950s, shows no signs of instability is in good condition and has a well rocked surface. Subsequent to operations any areas, where the rock has been removed due to activity, will be rerocked to the original surface depth. Considering the stability of the existing rocked road and the mitigation that will be applied subsequent to operations, the beneficial uses of water will not be undermined.

Appurtenant Roads
There are no appurtenant roads.

Haul Road Network
The Weir family has legal ingress/egress on Sheep Creek Road to Orr Springs Road. At least minor improvements (i.e. grading), will be made to this road prior to use by truck traffic. Use of the Mendocino Redwood Company (MRC) haul road system is subject to permission granted by MRC.

Unstable Areas

One unstable was identified. See Unstable Areas map.

- *Point C*: This point is associated with a debris flow/ torrent track: No longer active this feature appears to have stabilized and revegetated. Material lost in this event has come to rest above the road away from the watercourse. Equipment will be excluded and water directed away from this area. The perimeter of the area will be flagged with EEZ flagging (prior to operations), in which no heavy equipment will be allowed to operate.

Yarding Methods

Tractors and rubber-tire skidders will be used to log the entire unit. Most of the ground on which tractors will operate is gently sloping. A comprehensive skid road network exists. However, not all skid roads will be reused given their proximity to watercourses, numerous crossings and occurrence on steep slopes. Given coho considerations, no new trails will be constructed on slopes greater than 40% and no equipment will operate on slopes over 50%. Long lining will often be employed in support of this intention. At the discretion of the RPF, where deflection is adequate, cable yarding may be employed.

Watercourse Protection

The following watercourse protection will be employed on the NTMP:

Table 5. Watercourse Protection Widths

	Water Class	
Slope	**WLPZ Class II width in feet**	**ELZ Class III width in feet**
<30%	50	25
30-50%	75	50
>50%	100 (75 cable)	50

Class II

- Gulch 15 (Sheep Creek) that flows into John Smith Creek
  a) WLPZ 50-100 feet, slopes <30 to >50% (see Table 3).
  b) Protective measures:
     1. Prior to operations, WLPZ will be flagged. Prior to the pre-harvest inspection, trees within WLPZ will be marked. This will be done by the RPF or his supervised designee.
     2. Crossings flagged prior to pre-harvest inspection.
     3. In the first 25 feet (measured from the transitional zone), at least, 75% of the existing overstory and understory canopy, will be retained undisturbed, at least 50% of which will be composed of existing overstory conifers. In the balance of the WLPZ, at least, 60% of the existing overstory and understory canopy, will be retained undisturbed, at least 25% of which will be composed of existing overstory conifers. The overstory and understory will be left in the same species and size class distribution as currently exists. Additionally, at least, 75% of the surface cover will remain undisturbed.
     4. All existing embedded trees, large wood pieces or other woody material that presently function to store and/or meter sediment into downstream waters shall be retained.
     5. All trees that lean toward across or undercut by class I and II watercourses will be retained.
     6. Snags will be retained.
     7. Approaches to all watercourse crossing will be stabilized per section 1, seeding prior to October 15 or 10 days after creation if disturbed after October 15.
  c) One Class II Crossing Exists:
     1. *Point Z*: Prior to use this crossing will be upgraded in compliance with the 1600 California Department of Fish and Game Code. The 24" culvert presently in place is inadequate to support high winter flows. It will be replaced by a permanent culvert sized for a 50 year storm flow (54" pipe). Fill excavated to remove the existing culvert will be reused to construct the planned culvert fill. A broad rolling dip will be installed so that flood overflow will be directed back into the natural stream channel in case the culvert becomes plugged. Mulching and seeding will be used on bare fill slopes to reduce erosion.

If the stream is flowing at the culvert installation site at the time of replacement, a small dam will be constructed upstream only long enough to prepare the bed for the culvert. The culvert will be aligned with the natural stream channel and at the grade of the original stream-bed. It will be placed at the bottom of the fill, which will be compacted in 8" lifts. Further, armor will be used to stabilize the culvert inlet and outlet.

No negative impacts on wetland and/or riparian vegetation and fish and wildlife will occur. The project will have a positive impact on the watershed as the existing culvert with a high diversion potential will be replaced with a culvert with a much lower diversion potential.

The 18" inside ditch relief culvert, which outlets into the same pool will also be replaced as it is partially crushed. It will be replaced by a 18" by 30' culvert. Additional work to take place at this crossing will include increasing the turning radius so that trucks may turn onto Sheep Creek Road. The road surface will be rerocked and bare soil will be seeded and mulched pending upgrade activities.

Note: Less than 15% of the timber volume will be removed from the WLPZ. This extremely light harvest will leave ample sources of future LWD.

Class III

- several are present
  a) ELZ 25-50 feet, slopes <30 to >30% (see Table. 5)
  b) Protective measures:
     1. Equipment will be operated only at RPF-designated crossings, within the ELZ. These crossings will be designated prior to the pre-harvest inspection..
     2. All timber will be base-marked by RPF or his supervised designee prior to operations.
     3. At least, 50% of the understory vegetation will be left living and well distributed in the ELZ. Additionally, at least, 75% of the surface cover will remain undisturbed.
     4. All existing embedded trees, large wood pieces or other woody material that presently function to store and/or meter sediment into downstream waters shall be retained.
     5. Soil deposited will be removed and debris stabilized prior to October 15.
     6. All temporary crossings will be dipped out, with banks laid back at such an angle that no loose soil is able to enter the watercourse prior to October 15 or 10 days after creation if disturbed after October 15.
  c) Class III watercourse crossings exist:
     1. *Point S and T:* These crossings will be reused and treated per protection measure 6. Bare soil associated with these crossing will be seeded and mulched or packed with slash. Additionally, where soil in the Class III has been disturbed from past activity, it will be seeded and mulched or packed with slash.

Wet Areas

Wet areas that exist are associated with watercourses and are afforded adequate protection by being located within their protective zones.

Domestic Water Source

No domestic water sources exist within the unit boundaries or have the potential to be impacted by project activities.

Water Tanks and Wells

See Harvest Operations map for location. These features are located outside of the unit boundaries.

Winter Operations

During the period from 15 October to 15 November and from 1 April to 1 May, the following shall apply:

a) Tractor use shall occur only during dry, rainless periods where soils are not saturated.
b) Waterbars and/or rolling dips shall be installed prior to the end of the day if 30% chance of rain is predicted, and on weekends.

During the "winter period" 15 November to 1 April. The only winter operations will be timber falling. Falling will occur under the following conditions:

a) Falling can occur at anytime during the winter season, except in the WLPZ or in unstable areas.
b) Pick-up truck access on non-rocked roads will be limited to extended dry periods where no road surface rutting will occur. Otherwise, fallers must enter the area on foot or by using an all-terrain vechicle.

Hazard Reduction

Woody debris created by timber operations greater than one inch, but less than eight inches in diameter, within 100 ft of several dwellings maintained for human habitation in the unit will be removed. Slash created within 100 ft to 200 ft of these dwellings will be lopped or piled and burned.

To further reduce fire hazard and improve aesthetics, all slash within 100 feet or in the line of sight of all roads, main skid trails, and landings will be lopped or bulldozer-crushed to within 30" of the ground. Incidental hardwoods (>7"dbh), near roads and landings, which are damaged during operations will be lopped or skidded to landings. Landing slash will be spread and/or piled as directed by the RPF. Any burning will be the responsibility of the landowner. Also see section I, Pests and Diseases for treatment of slash.

Slash to be piled and burned will be treated no later than April 1 of the year following its creation.

EROSION HAZARD RATING

Surface Erosion Hazard is moderate throughout the NTMP.

ESTIMATED SURFACE SOIL EROSION HAZARD

RM-87 (4/84)

STATE OF CALIFORNIA
BOARD OF FORESTRY

I. SOIL FACTORS O-Z = Ornbaun-Zeni complex; 130 = 9-30% slope; 131 = 30-50% slope; 132 = 50-75%				FACTOR RATING BY AREA		
A. SOIL TEXTURE	Fine	Medium	Coarse	O-Z 130	O-Z 131	O-Z 132
1. DETACHABILITY	Low	Moderate	High			
Rating	1-9	10-18	19-30	18	18	18
2. PERMEABILITY	Slow	Moderate	Rapid			
Rating	5-4	3-2	1	2	2	2
B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK						
	Shallow	Moderate	Deep			
Rating	1"-19"	20"-39"	40"-60" (+)			
	15-9	8-4	3-1	3	3	3
C. PERCENT SURFACE COARSE FRAGMENTS GREATER THAN 2 MM IN SIZE INCLUDING ROCKS OR STONES						
	Low	Moderate	High			
Rating	(-) 10-39%	40-70%	71-100%			
	10-6	5-3	2-1	10	10	10
				SUBTOTAL	33	33	33

II. SLOPE FACTOR									
Slope	5-15%	16-30%	31-40%	41-50%	51-70%	71-80% (+)			
Rating	1-3	4-6	7-10	11-15	16-25	26-35	3	11	18

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE						
	Low	Moderate	High			
Rating	0-40%	41-80%	81-100%			
	15-8	7-4	3-1	3	3	3

IV. TWO-YEAR, ONE-HOUR RAINFALL INTENSITY (Hundredths Inch)							
	Low	Moderate	High	Extreme			
Rating	(-) 30-39	40-59	60-69	70-80 (+)			
	1-3	4-7	8-11	12-15	11	11	11
				TOTAL SUM OF FACTORS	50	58	65

EROSION HAZARD RATING							
	<50	50-65	66-75	>75			
	LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)			
				THE DETERMINATION IS	M	M	M

ESTIMATED SURFACE SOIL EROSION HAZARD
RM-87 (4/84)

STATE OF CALIFORNIA
BOARD OF FORESTRY

I. SOIL FACTORS C-Z = Comptche-Zeni complex; 191 = 30-50%				FACTOR RATING BY AREA		
A. SOIL TEXTURE	Fine	Medium	Coarse	C-Z 191		
1. DETACHABILITY	Low	Moderate	High			
Rating	1-9	10-18	19-30	17		
2. PERMEABILITY	Slow	Moderate	Rapid			
Rating	5-4	3-2	1	3		
B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK						
	Shallow	Moderate	Deep			
Rating	1"-19"	20"-39"	40"-60" (+)			
	15-9	8-4	3-1	3		
C. PERCENT SURFACE COARSE FRAGMENTS GREATER THAN 2 MM IN SIZE INCLUDING ROCKS OR STONES						
	Low	Moderate	High			
Rating	(-) 10-39%	40-70%	71-100%			
	10-6	5-3	2-1	9		
				SUBTOTAL	32	

II. SLOPE FACTOR

Slope	5-15%	16-30%	31-40%	41-50%	51-70%	71-80% (+)			
Rating	1-3	4-6	7-10	11-15	16-25	26-35	11		

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE

	Low	Moderate	High			
Rating	0-40%	41-80%	81-100%			
	15-8	7-4	3-1	3		

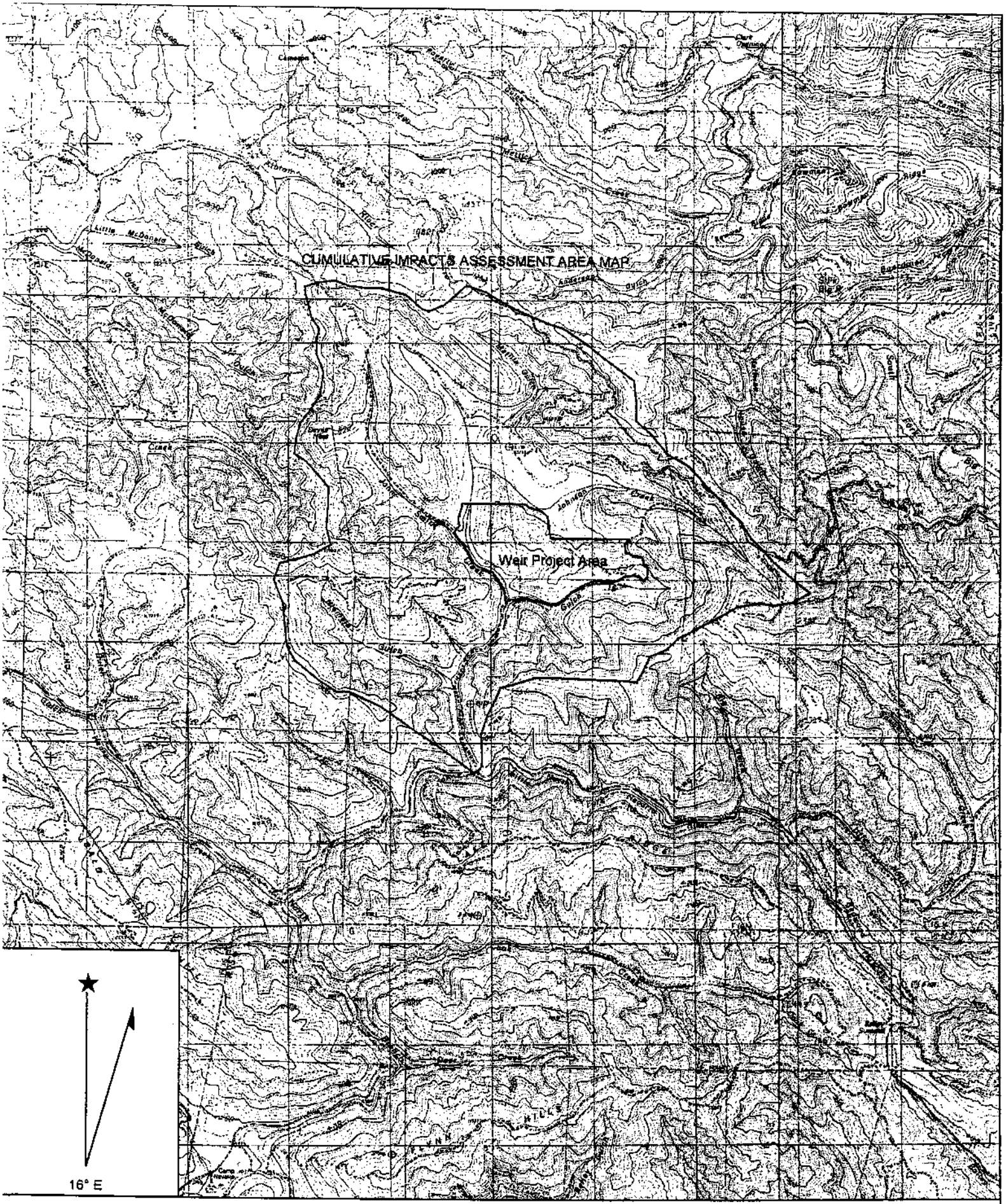
IV. TWO-YEAR, ONE-HOUR RAINFALL INTENSITY (Hundredths Inch)

	Low	Moderate	High	Extreme			
Rating	(-) 30-39	40-59	60-69	70-80 (+)			
	1-3	4-7	8-11	12-15	11		
				TOTAL SUM OF FACTORS	57		

EROSION HAZARD RATING						
<50	50-65	66-75	>75			
LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)			
			THE DETERMINATION IS	M		

SECTION THREE

CUMULATIVE IMPACTS ASSESSMENT



Name: NAVARRO, COMPTCHE, BAILEY RIDGE
Date: 10/28/99
Scale: 1 inch equals 4000 feet

Location: 10 454048 E 4341421 N
Caption: Cumulative Impacts Assessment Area Map

Contour Interval: 40'

STATE OF CALIFORNIA
BOARD OF FORESTRY
CUMULATIVE IMPACTS ASSESSMENT CHECKLIST

Cumulative Impacts Assessment Checklist	Yes	No
(1)Do the assessment area(s) or resources that may be affected by the proposed project contain any past, present, or reasonably foreseeable, probable, future projects? If the answer is yes, identify the project(s) and affected resource subject(s).	X	
(2)Are there any continuing, significant adverse impacts from past land use activities that may add to the impacts or the proposed project? If the answer is yes, identify the activities and affected resource subject(s).		X

(3)Will the proposed project, as presented, in combination with past, present, and reasonably foreseeable, probable, future projects identified in items (1) and (2) above, have a reasonable potential to cause or add to significant cumulative impacts in any of the following resource subjects?

Resource Subjects	Yes After Mitigation (a)	No After Mitigation (b)	No Reasonably Potential Significant Effects (c)
1. Watershed		X	
2. Soil Productivity		X	
3. Biological		X	
4. Recreation			X
5. Visual		X	
6. Traffic			X
7. Other			X

a) Yes, means that potential significant adverse impacts are left after application of the forest practice rules and mitigations or alternatives proposed by the plan submitter.
b) No after mitigations means that any potential for the proposed timber operation to cause significant adverse impacts has been substantially reduced or avoided by mitigation measures or alternatives proposed in the NTMP and application of the forest practice rules.
c) No reasonably potential significant effects means that the operations proposed under the NTMP do not have a reasonable potential to join with the impacts of any other project to cause cumulative impacts.

BOARD OF FORESTRY TECHNICAL RULE ADDENDUM NO. 2

Introduction

The Weir project area is 243 acres located in the John Smith Creek watershed and is 4 air miles south and east of the town of Comptche, CA in Mendocino County. This acreage will be selectively harvested on a sustained-yield basis. The following information is provided to substantiate the RPF's assertion that the proposed NTMP will not have significant cumulative impacts on the John Smith Creek watershed (sub watershed to the Navarro River watershed) or on the biological, soil, recreation, traffic or visual resources located in the assessment areas described below.

The assessment was conducted based on information that was reasonably available.

Description of Assessment Areas

Watershed Assessment Area (WAA)
The project area is located within the John Smith Creek watershed, sub watershed to the Navarro River watershed. The project area is drained by two first-order streams, Gulch 15 and Johnson Creek and by one second-order stream, John Smith Creek. Outside of the area drained by the project area, John Smith Creek flows into the North Branch North Fork of the Navarro River.. The John Smith Creek watershed was evaluated with respect to cumulative impacts as this watershed is the most likely to be impacted by this operation.

Located in Region 1 in the Navarro River Hydrologic Area, as defined by the State Water Resources Control Board, the EPA does recognize this watershed on the 303(d) as being impaired by sediment and temperature. TMDLs are scheduled to be completed in December of 2000. Presently, John Smith Creek supports an anadromous fish population, including coho.

The WAA is 3670 acres (5.7 square miles). The Watershed Assessment Area (BAA) covers the same area as the Biological Assessment Area (WAA) and is collectively called the Cumulative Impacts Assessment Area (CIAA). The proposed plan comprises 7% of the area. Mendocino Redwood Company owns the largest percentage of the WAA. The remaining percentage is owned by non-industrial private timberland owners, the largest being the Philbrick Family Trust. Although, most of the WAA is dedicated to timber production, small homesteads, meadows, riparian corridors and forestland lend to a diversity of land uses within the WAA.

Soil Productivity Assessment Area
The Soil Productivity Assessment Area is equivalent to the project area.

Biological Assessment Area
The Biological Assessment Area (BAA) covers the same area as the Watershed Assessment Area (WAA) and is collectively called the Cumulative Impacts Assessment Area (CIAA). This area circumnavigates the proposed NTMP beyond the 7/10 of a mile, recommended in consideration of the Northern Spotted Owl. Given, that the home range of species being evaluated varies, the BAA was established based on the biological resources at risk and is the area most likely to join with other activities to cause an impact on biological resources.

Recreation Assessment Area
The Recreation Assessment Area includes the area within the project boundary plus 300 feet. All lands adjacent to the plan area are privately owned by small and industrial interests.

Visual Assessment Area
The Visual Assessment Area is the logging area that is readily visible, depending on topography and location of public roads, to significant numbers of people who are no further than three miles from the proposed project area. Outside of the plan area plan activities will be visible only to adjacent landowners.

Traffic Assessment Area
The Traffic Assessment Area(s) are the first roads, which are not a part of the NTMP and on which logging traffic must travel. The Assessment Area includes Sheep Creek Road and John Smith Creek Road/ Philbrick Mill Road (private roads) and Orr Springs Road (county road), which are the first private and public roads outside of the plan area upon which trucks will travel.

Past Present and Future Activity

Introduction
Within the assessment area other activities, which include grazing, farming, ranching, road construction, etc. exist. The main publicly documented project activity, within the assessment area, is timber harvesting. Thus, evaluation of THP's and management plans submitted to CDF form the basis to identify management activities that may combine with the activities of the proposed plan to contribute to adverse impacts on watershed and biological resources. The CIAA was chosen as a representative assessment area for the past, present and future activities

PastActivity

Within NTMP Area
Although the project area was homesteaded by the Johnson family in the late 1800's, it was not logged until the 1950's. In 1959, the Philbrick family, attempted to convert the entire ranch to grazing. The remaining timber was clearcut, the ranch burned and aerially seeded with non native grasses at this time.

In 1982 the subsequent owners (the Mickles) harvested approximately 500,000 board feet, under a 1981 CDF approved management plan (THP-81-357). During the Mickles ownership pine and Douglas-fir was planted to supplement natural regeneration. Cattle was also grazed during this era. In 1996 the Weir purchased the adjacent parcels that comprised the Micklewood Ranch.

Tractors and more recently rubber tired skidders, were used to remove logs. Harvest in 1999 will emphasize thinning, general sanitation and improvement of stand structure.

Within the Assessment Area
At the turn of the century much of the old-growth redwood in the forested areas surrounding the project area was cut for railroad "ties". The second entry occurred after World War II, when the old-growth Douglas-fir was removed to supply the booming plywood business. Prescriptions employed in subsequent entries have varied from clear cutting to light selection. Presently, a mosaic exists throughout the CIAA and includes meadows, large blocks of regeneration and young even-aged blocks in a hardwood dominated matrix, and uneven-aged forest that has sustained multiple light and heavy selections with a heavy hardwood component. Among the large blocks of forested and non-forested area are small private ownerships with and without residences. Activities associated with these residences include gardening, farming, timber harvesting, livestock grazing, and development.

Past and Present projects were examined at the California Department of Forestry, Resources Management Office, in Willits, CA. The intent of this research was to determine if any timber harvest plans, management plans and/or timber sales have been approved within the last ten years whose boundaries are included within the CIAA. Timber harvest activities within the assessment area submitted since 1989 are summarized in Table 6.

Table 6. Past and Present Projects Within the Assessment Area (1989-1999)					
THP #	**% of CIAA**	**Acreage/ Silviculture**	**Harvest System**	**Status**	**Location (in T16N,R15W MDB&M)**
1-89-309	4%	150/ SH/REM	(1)	Closed	S. 26,35 and 36
1-89-807	8%	307/ SH/REM	(1), (3)	Closed	S. 16 and 17
1-90-78	10%	348/ SH/REM, 15/SEL, 1/ALT	(1)	Closed	S. 22, 23 and 24
1-90-686	9%	262/ SD/REM, 50/ALT, 15/REH, 15/SH/PREP	(1)	Closed	S. 20, 21 and 28
1-91-152	3%	91/SH/PREP, 12/SD/REM	(4)	Closed	S. 27, 28 and 33
1-94-362	6%	240/ALT	(1)	Closed	S. 15, 16, 21 and 22
1-96-266	7%	166/ SD/REM, 90/SN/SL, 19/SEL	(1), (3), (4)	Active	S. 27 and 28
1-97-101	4%	117/ SD/REM, 20/SN/SL, 18/REH, 3/SEL	(1), (3), (4)	Active	S. 17, 20 and 21
1-98-217	6%	175/ALT, 40/SEL	(1), (4)	Active	S. 20, 28 and 29
1-98-016(NTMP)	1%	41/SEL, SN/SL, CT	(1)	Active	S. 21 and 22
Total	**58%**				
Even: CC=Clearcut; SH/PREP=Shelterwood Preparatory; SH/SEED=Shelterwood Seed; SH/REM=Shelterwood Removal; SD/SEED=Seedtree Seed; SD/REM=Seedtree Removal Uneven: SEL=Selection; TR=Transition Other: REH=Rehabilitation of understocked areas; ALT=Alternative; CT=Commercial thin, SN/SL=Sanitation Salvage					
(1)Tractor, Skidder, Forwarder (2)Ground Lead (3)Cable High Lead (4)Cable, Skyline (5) Helicopter, Balloon					

In 1992 a Stewardship Plan was prepared and site preparation and planting were implemented on 60 acres in the west unit of the project area.

In the last ten years, a total of 58% of the BAA has been logged, 40% of which has been logged under even-aged prescriptions. Another 3% was selectively-logged, the balance of the area was treated under other prescriptions, including rehabilitation, sanitation-salvage and alternative prescriptions.

Present Activity

Within NTMP Area
Presently, there is no activity within the NTMP area.

Within the Assessment Area
Except for the THPs that are still open, no present timber harvest activity is known to exist. Activities in the assessment area that have occurred in the past are believed to presently occur, such as livestock grazing and homestead development.

Future Activity

Within the NTMP Area
All future timber harvesting activities in the Weir project area are addressed within the NTMP. The total allowable harvest volume will be removed from the project area over a 10 year period. Once the sustained-yield goals are attained, selection harvesting will remove no more than 40% of the volume every 10 years. Such a harvest intensity will remove only the incremental growth of the stand. This will be the sustained-yield harvest level that can be removed in perpetuity. The successors of the Weir families will be their children.

Under present management criteria, the RPF believes that future harvests under the NTMP will contribute to the health of the resources under consideration.

Within the Assessment Area
Other activities in the assessment area that have occurred in the past will likely occur in the future, such as livestock grazing and homestead development. It is logical to assume that timberland within the assessment area will likely be harvested at future intervals, especially on the lands of Mendocino Redwood Company and the Philbrick Family Trust. Currently, being prepared is a NTMP on lands owned by the Philbrick Family Trust. Operations are proposed in portions of sections 15, 16, 21, 22, 23, and 24 under uneven-aged management prescriptions.

Environmental and political constraints guarantee that future harvests and their impacts will be less intense than in the past. Logging practices will likely be more closely monitored and conducted under stricter rules. It is also likely that more uneven-aged prescriptions will be specified in future management plans.

Watershed Resources

Introduction
The main beneficial uses of water in the WAA are for domestic water supplies, cold freshwater habitat, wildlife habitat, and recreation. The potential impacts from timber operations to beneficial water uses in the area include activation of unstable slopes, sediment deposition in stream channels, increased water temperature, changes in organic debris levels, chemical contamination, and increases in peak storm stream flow and surface runoff rate.

All future activities in the project area are addressed in the NTMP. The lands in the WAA are used in residential and animal husbandry capacities and will be controlled by the appropriate regulatory agency.

This management plan will not have an adverse impact on the condition of the watershed based on considerations discussed in this section and the following:
a) the erosion hazard rating is moderate on the entire plan area.
b) the area will meet stocking standards immediately after selection harvest.

Sediment
Sediment-induced cumulative watershed effects occur when earth materials transported by surface or mass wasting erosion enter a watercourse system at separate locations and are then combined at a downstream location to produce a change in water quality or channel condition.

Roads and skid trails are identified as one of the major contributing sources of sediment. For this reason the RPF believes that the following will prevent sediment-induced watershed effects from management activities, including roads:
a) Stream protection zones serve as filter strips around watercourses inhibiting sediment. Only light selection harvesting will occur within these zones with retention standards outlined in section 2-watercourse protection.
b) High amount of ground cover left on the plan area after each entry.

c) Soil stability and transpiration provided by the healthy leave stand will contribute to slope stability. Outside of the stream protection zone, no more than 40% of the standing volume will be removed.
d) After skidding operations are complete, bare soil areas within the WLPZ (>100 sq. ft), will be stabilized per section I-erosion control, seeding.
e) No timber operations, except timber falling, will take place during the winter period. Outside of the winter period, no operations will occur when soil is saturated or within 24 hours following rainfall totaling ¼" or more.
f) No significant new road construction.
g) Watercourse crossings will be stabilized section 2-watercourse protection.
h) After operations are complete, truck road edges will be seeded.
i) In the first winter following harvest, roads will be checked following the first major rainfall, and again, during the middle of winter season.
j) Only selected original trails will be re-opened. Where feasible, every attempt will be made to not re-use trails closer than 100 feet.
k) No new trails will be constructed on slopes greater than 40%. Well-situated existing skid trails will be reused.
l) No equipment will operate on slopes over 50%.
m) All landings and roads proposed for reuse are outside the WLPZ with the following exceptions, mitigations are outlined in Section 2, "Existing Truck Road in WLPZ" and "Tractor Operations in WLPZ".
n) Roads will be ditched and graded, subsequent to harvest operations. Drainage may be greatly improved by the installation of rolling dips and enhancement of the outsloping.
o) Road drainage will be improved (see Table 7).

Map points listed in Table 7. are associated with management practices, described in the Section 2 of this plan, that will decrease the potential for sediment to enter the watershed.

Table 7. Preliminary Sediment Budget

Feature	Practice	Long-term Effect	Justification
Point B	A 4' extension will be added to the existing 24" culvert.	Positive	The road bed is being eroded into a Class III watercourse.
Point Z	Existing culvert with a high diversion potential will be replaced with a culvert with a much lower diversion potential.	Positive	Water flows over the road surface each winter. High probability the culvert will become plugged and the fill will be lost.

Surface erosion potential is related to ground disturbance.

Case Study: A 1988 post-harvest survey conducted in San Mateo County quantified ground disturbance in selective harvest of second-growth redwood (Hannon, 1991). This study removed 60% of the trees 18"dbh+. Since this harvest intensity is no greater than the proposed maximum long-term sustained-yield harvest on the project area, impacts in the watershed should be less than those found in the survey.

A summary of the survey:

Clusters of four 1/400th acre circular plots were uniformly distributed throughout four THPs over a 400 acre area. Estimates of percent ground cover were made in 5 classes: bare, 1-33%, 34-66%, 67-99%, and full cover. Ground cover measured was that which would be capable of mitigating rain drop impact and acting as a filter to retard surface water flow and sediment movement. Cover included grasses and herbs, leaf litter, duff, and slash. The study results are displayed in Table 8.

Table 8. Ground Cover in Sample Plots.	
Ground Cover	**% Samples**
Bare (0%)	10
0-33% cover	10
34-66% cover	16
67-99% cover	30
full cover (100%)	34
	100

The 10% completely "bare" samples were those falling within roads and trails. This corresponds well with the 10-15% figure often cited for the percentage of area disturbed by roads and trails in tractor selective harvesting. The data indicates that most of the survey area has adequate erosion control cover. Survey data shows that cover improves in bare areas as vegetation and litter re-establish. For example, the 1988 survey showed 13% bare area, but the 1985 THP, logged 3 years earlier, showed only 6% bare area. RPF experience in Mendocino County is that bare roadbeds are generally 90%+ covered with litter or vegetation within 2-5 years following selective harvest.

Relative to the San Mateo County study, the Weir NTMP harvest activity will:
a) produce less disturbed ground, since the harvest intensity is less
b) recover more rapidly, due to the more favorable growing conditions in the Mendocino County redwood region.

By removing no more than 40% of the total merchantable conifer stems at each entry, and emphasizing high-quality tree retention, a vigorous protective overstory canopy will remain.

Therefore, operations proposed under this NTMP will not produce adverse sediment effects which contribute to or create a reasonable potential for developing significant environmental impacts when examined singularly or collectively.

Temperature
Water temperature related to cumulative watershed effects are changes in water chemistry or biological properties caused by the combination of solar warmed water from two or more locations where natural cover has been removed.

The SYP summary for the North Branch Navarro states that John Smith Creek has summer time water temperatures that indicate a moderate level of concern for exceeding water temperatures for coho salmon.

Water temperature data was taken and is displayed in Table 9.

Table 9. Water temperature data (degrees Fahrenheit)				
Watercourse	Date	Time	Water Temp (°F)	Air Temp
John Smith Creek	10/27/99	1015	47°	50°
Johnson Creek	1/25/99	1500	49°	53°

Additional stream temperatures were collected by employees of LP and the California Department of Fish and Game (DFG) in John Smith Creek. Both temperatures were taken in the summer, DFG collected their data in 1994. LP recorded water temperatures of 57and 62°F at two locations. DFG recorded water temperatures, over a span of 13 days, ranging from 50 to 61°F and air temperatures ranging from 55 to 78°F. For the most part, these records are within the desirable range and no records extend into the critical range for coho.

Canopy cover of 50% and/or greater is present in the WLPZ of Class I and Class II watercourses that drain the project area and is composed of a mixture of conifers and hardwoods. Over-water canopy is much greater at 85% for most of their lengths. Canopy cover will continue to improve as time progresses given

the coho rehabilitation strategy of achieving and maintaining greater than 70% canopy cover on Class I watercourses and greater than 60% canopy cover on Class II watercourses. Canopy cover, after the first entry, will not be significantly reduced and in areas where adequate canopy cover does not exist in the WLPZ, no trees will be cut.

Therefore, operations proposed under this NTMP will not produce adverse water temperature effects which contribute to or create a reasonable potential for developing significant environmental impacts when examined singularly or collectively.

Organic Debris
Cumulative watershed effects produced by organic debris can occur when logs, limbs, and other organic material are introduced into a watercourse at two or more locations.

The importance of organic debris, both in streams and on the forest floor, is well known. The protection afforded watercourses should insure sufficient levels of organic debris input, which will stabilize watercourses and provide nutrients and structure for aquatic organisms.

Historically, logs had been removed from John Smith Creek. However, as a result of the shift in paradigm regarding the importance of logs in watercourses DFG in cooperation with the California Conservation Corps. (CCC) has been installing log structures. This is evidenced in John Smith Creek. The most recent installations took place in 1995.

All unstable organic debris created from this operation, deposited in class III watercourses will be removed or stabilized prior to completion. Any debris that enters, as a result of this operation, a class II watercourse will be removed immediately.

Therefore, operations proposed under this NTMP will not produce adverse effects related to undesirable introduction of organic debris which contribute to or create a reasonable potential for developing significant environmental impacts when examined singularly or collectively.

Chemical
Potential sources of chemical cumulative watershed effects include runoff from roads treated with petroleum or other dust retarding materials, direct application or runoff from pesticide treatments, contamination by equipment fuels and oils, and the introduction of nutrients released during slash burning or wildfire from two or more locations.

No herbicide or pesticide use in the project area is anticipated. Logging equipment will be serviced in compliance with the Forest Practice Rules. Oil will not be used on road surfaces. Used oil from on-site equipment will be disposed of in accordance with State Laws. No broadcast burning will occur.

Therefore, operations proposed under this NTMP will not produce chemical contamination effects which contribute to or create a reasonable potential for developing significant environmental impacts when examined singularly or collectively.

Peak Flows
Cumulative watershed effects caused by management-induced peak flow increases, during storm events, are difficult to anticipate. Peak flow increases may result from management activities, which reduce vegetative water use and crown canopy interception, or change the timing of flows by compacting soil.

Peak flows after harvest activities should not increase because of the following reasons:
a) high post-harvest canopy cover.
b) retention of vigorous trees and rapid re-sprouting
c) high magnitude of undisturbed area.
d) harvest entries are approximately 10 years apart.
e) maintenance of organic matter cover to protect the soil from rain-drop impact will facilitate infiltration, and lessen run-off.

Research indicates that selection-cutting and tractor-yarding second-growth redwood and Douglas-fir in the South Fork of Caspar Creek in Jackson Demonstration State Forest, Fort Bragg, CA did not significantly change peak storm flows. Removal of stand volume ranged from 59% to 65% (Ziemer, 1998). Since Caspar Creek was logged more intensely than proposed in the Weir NTMP, increased peak flows are not anticipated from the plan activities.

Therefore, operations proposed under this NTMP will not adversely contribute to peak flow effects which contribute to or create a reasonable potential for developing significant environmental impacts when examined singularly or collectively.

Streambed & Riparian Vegetation Condition

Watershed impacts of past upstream and on-site projects are often reflected in the condition of the stream channels on and adjacent to the plan area. A stream inventory was completed on John Smith Creek in the summer of 1994.

John Smith Creek supports channel types F4, B4 and F3. The reach of John Smith Creek that borders the project area is a B4 channel. B4 channels are moderately entrenched, moderate gradient, riffle-dominated channels with infrequently spaced pools, very stable plan and profile, and stable banks. The survey results for the entire length of the survey were discussed as follows:

a) Pools comprised 41% of the total length of the survey. It is generally desirable to have primary pools (greater than 2 feet in depth) comprise approximately 50% of the total habitat. Since the survey in 1994, log structures have been installed in John Smith Creek to meet this end (see this section, organic debris).
b) Pool were relatively deep with 82 of the 141 pools having a maximum depth greater than two feet.
c) Embeddedness ratings of 3 or 4 were measured in 44 of the 139 pool tail-outs. Thirty had a ratiing of one, where cobble embeddedness is less than 25%. The level of embeddeness can be improved by controlling sediment sources (see this ection, sediment).
d) Shelter rating for pools was low with a rating of 29, in flat-water it was better at 47. The desired shelter rating is 100. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.. Log structuers installed since the survey have improved this rating.
e) Substrate is dominated by cobble, 88 of the 118 low gradient riffles had gravel or small cobble as the dominant substrate. A cobble dominated substrate is genearlly considered good for spawning salmonids.
f) Mean percent canopy was 74%. This is a relatively high percentage of canopyas 80% is generally considered optimum for north coast streams.

Note: No problem sites were recognized along the reach of John Smith Creek that borders the project area.

Along the reaches of class I and II watercourses that drain the project area the following generalizations can be made:

a) Segments of the riparian corridor show evidence of 1950-60's logging when logs were skidded directly in the watercourse. Including at least four locations where the channel was crossed, but have since blown out.
b) Generally stream banks are stable and well vegetated and have very little fresh, exposed soil.
c) Riparian vegetation is well-established, providing stream-bank stability and adequate sediment filter strips.
d) Conifers, bigleaf maple, Pacific wax myrtle, willow, evergreen huckleberry, ferns and horsetail combine to form a dense over-water and WLPZ canopy that protects the stream. Redwood and Douglas-fir, compose much of the overstory.
e) WLPZ canopy ranges from 50% to 100% and is composed of mixture of hardwoods and conifers.
f) Large organic debris in the watercourses are often well-anchored in the banks, providing bank stabilization, and complexity to the stream channel.

Protection afforded riparian areas should be adequate to prevent degradation of present watercourse conditions. In fact, practices summarized in this section will likely have a positive long-term effect on the condition of the watershed. Thus, plan activities, when considered individually or with other management activities in the CIAA, will not lead to adverse impacts on the condition of the watershed.

Soil Productivity

Introduction
The majority of the project area is gently sloping. Soil complexes located in the project area include the Ornbaun-Zeni, Yellowhound-Kibesillah and the Comptche-Zeni and yield an EHR of moderate. The Ornbaun-Zeni complex is best represented in the project area. The project area is composed of Site III lands. Annual precipitation is 55 inches.

There are no ongoing serious erosion problems within the NTMP area. The area shows very little sign of surface erosion. Dense understory vegetation and protective duff and litter accumulation protect the previously disturbed and harvested areas.

An increase in erosion from on-site logging activities, beyond natural levels, can result in the decrease of soil depth and an increase of sedimentation into watercourses. Loss of soil depth can decrease the available water capacity, nutrient storage, and rooting volume. The end result of decreasing soil depth is decreased soil productivity.

On-site factors contributing to the accelerated erosion process include the compaction of soil, most often caused by heavy equipment and loss of surface organic matter. Soil compaction results in the decreased movement of water into and through the soil. A decrease in available water capacity results in increased surface runoff, which can lead to accelerated erosion. Compaction also results in decreased soil aeration, which can decrease microbial activity and root growth penetration which decreases plant growth.

The loss of organic matter from increased surface runoff or logging activities can also affect the short- and long-term nutrient supply to vegetation. Surface organic matter acts as erosion protection and can decrease the compacting effects of ground-based heavy equipment. Organic matter in the soil increases water storage and soil stability.

The proposed project, as described and mitigated, has the potential to produce the following individual effects as described in Table 10.

Table 10. Impacts Evaluation

Will the proposed project, as presented, in combination with past, present, and reasonably foreseeable, probable, future projects have a reasonable potential to cause or add significant cumulative impacts in any of the following resource subjects

Resource Subjects	Yes - After Mitigation	No - After Mitigation	No Reasonably Potential Significant Effects
1. Organic matter loss		X	
2. Surface soil loss		X	
3. Soil compaction		X	
4. Growing space loss		X	

Organic Matter and Surface Soil Loss
An existing skid trail and truck road network is in place. Since equipment activity will be confined to trails, roads, and landings, only a small portion of the existing organic material will be disturbed. When operating off trails, the operator will keep the blade raised to prevent top-soil movement.

Estimated depths of pre-harvest organic materials range from, 0-1" on skid trails, roads, and landings, to 4" on the forest floor. This includes material in various stages of decomposition, from newly fallen leaves and twigs to well-decomposed matter.

Most slash generated from the NTMP area will be left on-site, contributing to the existing organic material. In some areas slash will be crushed into skid road surfaces to provide a protective layer over the road surface. In other areas slash will be lopped to facilitate decomposition.

By removing no more than 40% of the total merchantable conifer volume at each entry, and emphasizing high-quality tree retention, a vigorous protective overstory canopy will remain.

Single tree selection has the least impact on the soil. The greatest potential for adverse impacts is keyed to those systems that remove the most trees (Zinke 1983). Zinke ranked silvicultural systems in order of extent of soil disturbance and amount of biomass removed in the harvest in table 11.

Table 11. Silvicultural systems ranked by degree of potential soil disturbance

Silvicultural system	**Description**	**Maximum area affected and biomass removed**
Clearcut (biomass harvest)	All trees felled at one cutting	90+% of area affected, all stems and crowns removed
Clearcut (conventional harvest)	All trees felled at one cutting	90+% of area affected, all commercial logs removed
Seed tree	One cut removal of mature trees with small number seed trees left	90% of area affected, 90% of trees removed
Shelterwood	Upper canopy trees removed in stages. Remaining canopy shelters regeneration	80% of area affected, 80% of trees removed
Group selection	Groups of trees removed periodically in small (<5 acre) patches	20% of area affected, 10% of trees removed
*Single tree	Trees harvested singly and periodically	10% of area affected, 5% of trees removed
*Types of silviculture prescribed in this NTMP. Selection harvesting will leave sufficient trees to meet stocking standards immediately after each harvest.		

In summary, plan activities (i.e. selection and use of existing roads) will not reduce surface soil or organic matter to adversely impact soil productivity.

Soil Compaction
Operations will be conducted only during dry periods when soil compaction is minimized. Other than timber falling, there are no winter operations proposed in this plan. Additionally, equipment will operate only on existing skid trails and roads, with exception of a short segment of new road that is proposed.

In summary, plan activities will not increase compaction to adversely impact soil productivity.

Growing Space Loss
While growing space is reduced under uneven-aged systems due to dedication of a permanent skidding system, this will be offset by inter-planting of seedlings in openings created by harvest, even though the leave stand will exceed basal area requirements

No landing excavation is required for tractor operations. Most landings exist. Landing size will be as small as possible, allowing for safety precautions. Unnecessary existing trails will not be re-opened. These areas will be retained for productive growing space.

In summary, by minimizing landing size, avoiding reuse of unnecessary skid trails and planting, plan activities will not contribute to the loss of growing space.

- ❖ Riparian Corridors - fish bearing streams, cool microclimate, riparian vegetation. These areas provide water for insects, reptiles/amphibians, birds, and mammals. As animals are attracted to these areas for water and edible vegetation, so are other animals intent on feeding on them.
- ❖ Within stand diversity (i.e. lichens, mycorrhizae, springs and rock outcrops)

Important components contribute to wildlife habitat on the Weir project area, they include:
- ❖ Fish-bearing and non-fish-bearing riparian corridors and springs.
- ❖ Snags and coarse woody debris.
- ❖ Edge between grassland and forestland and between adjacent landowners with different managemnt strategies.

Perforation and fragmentation, that have the potential to degrade the home range movements, migration, dispersal and geographic range shifts, will be mitigated by employing land use practices that do not drastically change the original ecosystem (uneven aged management using light selection silviculture). Management strategies that will protect these elements and complexes follow
- ❖ Limited management in riparian corridors and next to springs.
- ❖ Retain structural components (i.e. large trees, snags and downed wood, defective trees).
- ❖ Maintainance of the edge environment. The grassland area will be maintained given homesteading activities as will the forest structure that borders it via uneven aged management.
- ❖ Enhancement of canopy layers via uneveaged management.
- ❖ Advanced regeneration and herbaceous and shrub layers will be left undisturbed wherever possible.
- ❖ Light tree selection, lack of site prep, and restricted concentrated soil disturbance (confined to skid trails and existing roads) will sustain the integrity of the soil environment (i.e. mycorhhizal asspciation).
- ❖ Control of reentry periods, harvest and roads.
- ❖ Protection of herbaceous and shrubby plants.
- ❖ Protection of advanced regeneration.

Lynn Stafford and Ted Wooster, CA Fish & Game biologists, propose that 99% of wildlife concerns can be addressed by following these guidelines:
- ❖ Retain all riparian areas.
- ❖ Retain snags.
- ❖ Do not create "hot burns" to prepare planting sites.
- ❖ Maintain woody debris on the ground.
- ❖ Adjust silviculture prescription to create a mosaic of mixed species and mixed-aged stands, which provide for sustained yield.
- ❖ Manage WLPZ to provide full stream shading while retaining some larger, older trees.
- ❖ Provide forest "islands" that will protect spotted owls, as well as provide older type forests in the future.

Except for item "c", which does not apply, the Weir NTMP incorporates all these elements. The RPF concludes that not only will wildlife be protected, but the NTMP will enhance habitat.

It is the landowners' goal to retain a healthy, vigorous, and diverse forest compatible with associated forest values.

Following are management modifications and protection measures to maintain the integrity of these habitat components and the species that use them.

Aquatic Habitat
Associated with the project area, John Smith Creek and the lower reaches of Gulch 15 provide the most significant habitat as they support anadromous fisheries. The upper reaches of Gulch 15, Johnson Creek and springs support non-fish habitat. Pools in the class II watercourses, can be deep and are often well-protected to provide year-round non-fish habitat and year-round water for terrestrial wildlife.

As part of DFGs stream inventory, three sites were electrofished on July 8, 1994 in John Smith Creek:

- The first site yielded 43 steelhead between 30 and 63mm, seven coho between 47 and 67mm, ten three-spine stickleback between 29 and 55mm, two California roach (40mm), one 60mm sculpin, two Pacific giant salamanders, one yellow-legged frog and two crayfish.
- The second site yielded 39 steelhead between 36 and 139mm, eight three-spine stickleback between 43 and 56mm, one unidentified frog and two crayfish.
- The third site yielded 11 steelhead between 31 and 178mm, one 95mm coho, thirteen three-spine stickleback between 22 and 52mm, four Pacific giant salamanders, one unidentified frog and unidentified newt.

As part of L-P's fish inventory , a fish distribution survey was done on July 21,1995 at two locations in John Smith Creel, using an electrofisher, the following data was recorded:

- Stream temperatures were 14° and 16.5°C.
- Stream flows ranged from intermittent to less than 1.0 cfs.
- Stream visibility ranged from 1.0 to 5.0 feet.
- At the first location, using the electrofisher for 10.1 minutes resulted in 10 to 40 steelhead from less than 70mm to over 130mm (young to yearling, plus).
- At the second location, using the electrofisher for 2.8 minutes less than 10 coho salmon less than 70mm (young of the year) were found.
- Other vertebrate species present were Pacific giant salamander, stickleback and yellow-legged frog.

On 10 October, 1999, Thembi Borras (Forest Technician) observed 3 salmonids in a John Smith Creek pool (1.5 ft deep) and in November observed 1 salmonid in a pool in the lower reaches of Gulch 15.

Scott Harris, DFG fisheries biologist, provided downstream migrant trapping data for three years 1995, 1996 and 1997. Data was collected at the Boy Scout Camp on the North Fork of the Navarro River. Given the low numbers of coho (young of the year and young +), the coho population is barely hanging on in the North Fork of the Navarro River.

Harvest operations will not adversely affect near-stream vegetation, stream temperatures, woody debris sources, or generate sediments, which could adversely affect aquatic habitat given the protection afforded watercourses. High canopy retention and road improvements should improve the condition of the watershed and aquatic habitat.

Coho Considerations

The intent of these considerations is to determine how the project will effect coho and to propose measures that will afford protection to the fishery. The document "Coho Salmon (*Oncorhynchus kisutch*) Considerations for Timber Harvest under the California Forest Practice Rules produced by California Department of Forestry and Fire Protection (CDF) was used to guide these considerations and will be referred to as the coho guidelines, herein.

The project area is bordered on the east and south by Sheep Creek and on the west by John Smith Creek. The project area is drained by John Smith Creek and its tributaries, Johnson Creek and Gulch 15. John Smith Creek is a tributary to the North Branch North Fork of the Navarro River. John Smith Creek supports anadromous fisheries. Gulch 15 also supports anadromous fisheries in the lower reaches of watercourse before joining John Smith Creek. The reaches of Johnson Creek that border the project area do not support anadromous fisheries.

Conservation measures in stream-side and upland areas have both been emphasized. According to the coho guidelines; in stream-side areas, the focus is on restoring and maintaining coho habitat by addressing large woody debris (LWD)-present concentration and future recruitment, shade and temperature, and nutrients and food base; and in upland areas, the focus is less on vegetative features and more on maintaining hydrologic and sediment processes, to which roads are central. Sediment, Stream Flow and Large Woody Debris (LWD) are discussed below. However, stream-side vegetation in the Watercourse and Lake and

Protection Zone (WLPZ) is addressed in the NTMP, watercourse protection. This NTMP employs selective silvicultural treatment toward an uneven aged management goal.

Temperature
See this section, watershed resources - temperature

Sediment
See this section, watershed resources-sediment.

Large Woody Debris
See Section I, watercourse protection.

Streamflow
1. Higher water consumption by thinned trees will help offset the increased overland flow caused by the compaction associated with existing roads.
2. Many skid trails installed during previous entries will not be reused, instead long lining will be employed, allowing skid trails to be occupied by vegetation leading to increased infiltration.
3. Water intakes to drafting mechanisms will be screened and the rate at which drafting/diversion occurs will be adjusted to insure no visible drop in the water surface downstream of the intake/diversion point.

Additional Considerations
a) All trees within the WLPZ will be marked by RPF or supervised designee.
b) Less than 15% of the timber volume will be removed from the WLPZ. This extremely light harvest will leave ample sources of future LWD.
c) No salvage logging will take place within the WLPZ.
d) No new Class I or II WLPZ facilities will be installed.
e) Class III crossings will be stabilized per, section II-watercourse protection.

Timber operations have been designed to preserve and promote an adequate level of canopy, retain low-to-medium overhanging vegetation and LWD, and provide for large conifer trees for future LWD recruitment. These management modifications and protection measures will afford protection to coho and other riparian dwelling species associated with the plan area.

Terrestrial Habitat
Clearcut in the 1950s, this second-growth even-aged forest presently supports an overstory that is dominated by redwood and to a lesser extent Douglas-fir, young pine represents a significant portion of the regeneartion (see Table 1). The timber stand differs on the greater portion of south facing slopes as compared to the north facing slopes. On south facing slopes redwood occurs in clumps, Douglas-fir occurs in pockets, in a matrix of either grassland or hardwoods. On north facing slopes the conifer density (dominated by Douglas-fir) is greater and the pine and grassland components do not exist. Residual redwoods are very widely scattered. Hardwoods are a significant component of the forest. However, most are small (DBH < 12"). Hardwood species include tanoak, Pacific madrone, California bay and live oak. Understory species include blue blossom, greenleaf manzanita, evergreen huckleberry and coyote brush. Bigleaf maple, Pacific wax myrtle and willow are a component in the riparian corridors

The project area is home to all the common mammals and birds of coastal Mendocino County including black-tail deer, California quail, black bear, feral pigs, bobcat, mountain lions, coyotes, striped skunk, and raccoon. In the fall of 1999 a Pacific Giant salamander was observed on the north facing slope in the duff below a redwood and Douglas-fir canopy.

Terrestrial and Avian Considerations

A relatively heavy protective cover will remain post-harvest. Emphasis is to be upon thinning redwood clumps and dense thickets of Douglas-fir, general sanitation and improvement of stand structure. Trees will be thinned to improve individual tree spacing and stand structure. The largest diameter trees are left until the trees reach the target size at which point no more than 40% are harvested (in each entry) to favor young small diameter trees. This will promote the objective of retaining high-quality redwood and Douglas-fir for future growth. The leave stand will contain trees of all species, sizes, and ages, including hardwoods, ranging in size from saplings to trees 30"+ dbh.

The timber stand will be individually marked and selectively logged. Though all post-harvest stands will meet or exceed the Forest Practice stocking standards, where necessary, harvested areas will be inter-planted with redwood and Douglas-fir seedlings in the first winter after logging.

Seeding

During erosion control and following logging, roadsides, portions of WLPZ, and all landings are seeded with forage species favored by wildlife. The seed mixture includes annual rye, barley and crimson clover.

Snag Retention

Snags are a critical component of optimum wildlife forest habitat. Mammals den in them, raptors perch in them, and woodpeckers feed in them. Snags provide food and shelter for 85 bird species and 49 mammal species in North America.

Snags, especially those greater than 16", are lacking across the project area due to the previous management strategies including clear cutting and burning. Larger number of small and medium sized snags exist, created in part from the 1959 burn and from disease in the Douglas-fir (*Phellinus pini*). Only a few outstanding snags (greater than 40") remain. These will be retained. Until snags reach a density of 1 per acre greater than 16" and 1 per 5 acres greater than 24" per acre, marking will be performed so that snags are retained and protected.

As snags are recruited, the composition and distribution will reflect the species mix and distribution present at the time of recruitment. However, it is not anticipated that snags or decadent trees will need to be recruited as there is a history of wind damage (on the ridges), lightening and *Phellinus pini* in the stand. These natural disturbances in combination with discretion in marking will ensure ample recruitment of snags and LWD in the future. Low quality trees or large trees with only one or two merchantable logs, which often have pockets of rot and broken tops will be retained. In the partially completed 1999 marking snags were retained and protected by an effective buffer of leave trees. Conky Douglas-fir and partially rotten redwoods were intentionally recruited as snags. Additionally, riparian buffers and wind buffers (along the grassland areas on the ridges) have been retained to protect the watercourse associated resources and the interior stand, respectively. In these buffer areas large trees are left and allowed to become deformed by age and wind.

Downed Logs

Reptiles, amphibians, and small wildlife live within and around old down logs. Wildlife value is proportional to log diameter and length, with logs on the contour being better utilized than those lying perpendicular to the slope. Merchantable redwood logs are sometimes salvaged, but others are left undisturbed. Unmerchantable logs skidded to the landings are hauled back into the forest and cull logs produced during timber operations are often left in the woods, thus insuring ample supply of coarse woody debris for the future. Fire damaged trees that are not harvested will also contribute to the future supply of LWD. By providing important habitat for many small species, these down logs serve as focal points, which attract larger wildlife to feed upon the smaller log dwellers.

Hardwood Retention

Large hardwoods, especially those with rotten cavities, are favored by wildlife. Cavities are excavated by woodpeckers into denning sites for mice, owls, and squirrels. Sometimes, at the expense of conifer growth, large hardwoods are retained.

Pre-commercial Thinning, Commercial Harvest, Fuelwood Cutting

Pre-commercial thinning, commercial harvest, and fuel-wood cutting will have the beneficial effect of opening, at least temporarily, the forest canopy. Increased light encourages herbaceous forage. As the canopy closes, habitat values will decline (for species dependent on openings in the forest canopy) until the next cutting re-opens it.

Late Seral Stage (LSS)

No late seral stage forest currently exists within the NTMP area. However, the RPF believes that the Weir project area will meet wildlife late seral stage requirements as a by-product of the proposed management program in the following ways:

a) **Special late seral wildlife habitat features** include snags, live cull trees, down non-merchantable and logs. Special attempts will be made to retain the four components of old-growth ecosystems:
   1. large standing trees, legacy trees[2]
   2. large standing snags
   3. large down logs
   4. large woody debris in watercourses
b) A **multi-layered canopy** will be developed and enhanced by employing uneven-aged management where the goal is to provide trees in all ages and size classes, and by retention of hardwoods, even at the expense of conifer growth.
c) **Connectivity** is provided by continuous stand cover resulting from uneven-aged management.
d) **Large average tree diameters** is provided by the management goal of growing quality trees. It is proposed that the average diameter of dominant trees in managed 70-80 year-old stands will exceed the average diameter of natural stands at CMAI.

It is the RPF's opinion that proper management will produce overall wildlife conditions in 80 year-old managed stands on the Weir project area which, are not significantly different from conditions encountered in unmanaged 120 year-old stands.

Road Density

For the purpose of this discussion, all permanent and temporary roads associated with the project area are existing and are closed to the public. Therefore, road density as related to this NTMP will not produce adverse effects related to wildlife movement when examined singularly or collectively.

Sensitive Wildlife Species

The BAA is the area in which wildlife was assessed.

On November 3, 1999 the United States Fish and Wildlife Service (USFWS) reported that four fish species, three bird species, one invertebrate and one mammal are associated with the Navarro 7.5' quadrangle. Fish species include Northern California steelhead, tidewater goby, California coastal Chinook salmon and central California coast coho salmon. Avian species are the northern spotted owl, marbled murrelet and the bald eagle. The mammal is the Point Arena mountain beaver. The invertebrate is the lotis blue butterfly.

According to the California Department of Fish and Game (DFG) through the Natural Diversity Database (NDDB) there were no occurrences of sensitive wildlife species (other than northern spotted owl) in the BAA.

Species were also identified from environmental documents for other projects in the vicinity and personal knowledge of the area. The yellow-legged frog, northern goshawk and California red tree vole were also considered.

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[2] *Legacy trees are large trees that will not be harvested. They will be retained at a level of one tree per five acres. Legacy trees will have a dbh greater than 40". Presently the number of legacy trees is below one tree per five acres. Thus, trees from the largest diameter class will be recruited. The composition and distribution will reflect the species mix and distribution present at the time of recruitment.*

There is no centralized source for sensitive species per area, making it difficult to compile a current and accurate sensitive species list (Ambrose, pers. comm. 1998).

Following, for each species, is a description of the habitat, the availability of habitat within the project area and the BAA, occurrence within the project or BAA and management considerations.

INVERTEBRATES

Lotis Blue Butterfly (*Lycaeides idas lotis*)

Status: Fed – Endangered.

Habitat: Coastal bog. Forage on *Lotus formosus.*

Occurrence: Possibly extinct, known only from a few sites near Mendocino on California's Northcoast. Last seen near Mendocino in 1983.

Habitation Potential: Not Applicable in the plan area due to lack of habitat (there are no coastal lagoons) and lack of forage.

Management Considerations: None.

Sources: CDF&G 1996; Berkeley Entomology.

FISH

Coho Salmon (*Oncorhynchus kisutch*) - *Central California Coast Evolutionarily Significant Unit*

Status: Ca - Proposed Threatened; Fed - Threatened; Board of Forestry - Sensitive.

Freshwater Habitat: Coastal streams accessible to the Pacific Ocean with suitable spawning/egg-to-fry emergent gravels and summer rearing habitats including, but not limited to; 1) water temperatures around 50 to 59°F(not exceeding 72 to 77°F), 2) high proportion of pools, undercut banks, in-stream large woody debris, and riparian canopy and 3) abundant food supply.

Occurrence: Spawn in many coastal streams in California from the San Lorenzo River in Santa Cruz County north to Punta Gorda in south coastal Humboldt County. Coho are known to occur in John Smith Creek.

Habitation Potential: High within the project area and within the BAA.

Management Considerations: See coho considerations.

Sources: NMFS 1996; Moyle et al. 1989

California coastal Chinook salmon (*Oncorhynchus tshawytscha*)

Status: Fed - Threatened

Freshwater Habitat: Coastal streams accessible to the Pacific Ocean with suitable spawning/egg-to-fry emergent gravels and summer rearing habitats.

Occurrence: Spawn in many coastal streams in California. Chinook were not recorded in any of the inventories described in this section, aquatic habitat.

Habitation Potential: High within the project area and within the BAA.

Management Considerations: Management modifications and protection measures designed for the coho will afford protection to these species (see coho considerations).

Sources: Moyle et al. 1989

Steelhead Trout (*Oncorhynchus mykiss*) - *Northern California Evolutionarily Significant Unit (ESU)*

Status: Fed - Sensitive Species and Proposed Federally Threatened; Ca - Special Concern Species; Board of Forestry - Sensitive

Freshwater Habitat: Appear to be habitat generalists and are found in a variety of perennial stream habitats accessible to anadromy.

Occurrence: Populations under this ESU occur just north of the Russian River in Sonoma County up to Redwood Creek in Humboldt County. Steelhead are known to occur in John Smith Creek.

Habitation Potential: High within the project area and within the BAA.

Management Considerations: Management modifications and protection measures designed for the coho will afford protection to these species (see coho considerations).

Sources: NMFS 1996; Moyle et al. 1989.

Tidewater Goby (*Eucyclogobius newberryi*)

Status: Fed - Endangered; Ca - Special Concern Species.

Habitat: Coastal lagoons or estuaries and slow-moving brackish water.

Occurrence: Known to occur from San Diego County to the Smith River in Del Norte County, California.

Habitation Potential: Not Applicable in the plan area or BAA, there are no coastal lagoons, estuaries or brackish water within the plan.

Management Considerations: None.

Sources: Moyle et al. 1989; USFWS 1994.

AMPHIBIANS

Foothill Yellow-legged Frog (*Rana boylei*)

Status: Fed - Species of Special Concern; Ca - Special Concern Species; Ca - Fully Protected.
(The status of this species has been dictated by population declines in the Central Valley and Southern California, the populations in Sonoma County are not considered "at risk".).

Habitat: Perennial streams with rocky substrate. Uses a wider range of habitats than the Northern Red-legged Frog.

Occurrence: California throughout Coast Range and east to the Sierra-Nevada's; Absent in Central Valley of California.

Habitation Potential: High within plan area and BAA.

Management Considerations: Management modifications and protection measures designed for the coho will afford protection to these species (see coho considerations).

Sources: Zeiner et al. 1990; Jennings and Hayes 1994.

BIRDS

Northern Spotted Owl (*Strix occidentalis caurina*)

Status: Board of Forestry - Sensitive; Ca – Special Concern Species Fed – Threatened.

Nesting and Roosting Habitat: Mature conifer forests.

Occurrence: Occurs along the North Coast Range of California south to Marin County. Occurrences of Northern Spotted Owl in the BAA are recorded in the CDF NSO database.

Habitation Potential: Low within plan area; High within BAA.

Management Considerations: Although the timber stand does not provide spotted owl nesting and roosting habitat because of small average dbh, three NSO territories have been recorded within the outer 1.3 miles of the plan boundary. NSO consultation will be submitted prior to second review, see this Section, northern spotted owl.

Sources: Zeiner et al. 1990; Burridge (ed.) 1995; P. Town 1999.

Marbled Murrelet (*Brachyramphus marmoratus*)

Status: Board of Forestry - Sensitive; Ca - Endangered; Fed – Threatened.

Habitat: Uses marine and pelagic habitats for foraging; Nests in coastal coniferous forests.

Occurrence: California range extends coastally from the Oregon border south to Santa Cruz County.

Habitation Potential: Not applicable in plan area, due to lack of habitat; Low within the BAA.

Management Considerations: None.

Sources: Zeiner et al. 1990; Bolander and Parmeter 1992; Shuford 1993; Ralph 1995; USFWS 1997

Bald Eagle (*Haliaeetus leucocephalus*)

Status: California Board of Forestry - Sensitive; Ca - Endangered; Fed - Threatened.

Habitat: Forages from lakes and large rivers (also forage on carrion); Nests on cliffs or large trees. Perches are often high in large-limbed trees on snags, broken-topped trees, or on rocks near water.

Occurrence: Distributed uncommonly across most of California; Breeding territories are limited to Northern California; however, new evidence suggests that this species is naturally emigrating southward along coastal California (Rich Stallcup, Point Reyes Bird Observatory 1995). Wintering individuals have been observed perched (Blencowe pers. commun. 1997) and foraging on salmon carcasses in streams of Mendocino County (Ambrose pers. comm. 1997). No nests exist in the plan area.

Habitation Potential: Low within plan area due to limited nest and perch trees; Moderate within BAA

Management Recommendation: Retention of snags (where feasible) and protection afforded by WLPZs around class II watercourses will provide sufficient protection to prevent a significant adverse impact on this species.

Sources: Zeiner et al. 1990; Bolander and Parmeter 1992; Shuford 1993; Burridge (ed.) 1995.

Golden eagle (*Aquila chrysaetos*)

Status: Ca – Special Concern Species; Ca - Fully Protected; California Board of Forestry - Sensitive; Fed - Protected.

Habitat: Grassland, oak savanna, and open woodland and chaparral habitats with rocky-outcroppings and large trees used for nesting.

Occurrence: Uncommon permanent resident and migrant of California. No nests exist in the plan area.

Habitation Potential: Low within plan area due to limited nest trees and lack of habitat; Moderate within BAA

Management Recommendation: Retention of snags (where feasible) and protection afforded by WLPZs around class II watercourses will provide sufficient protection to prevent a significant adverse impact on this species.

Sources: Zeiner et al. 1990; Bolander and Parmeter 1992; Shuford 1993; Burridge (ed.) 1995.

Northern Goshawk (*Accipiter gentilis*)

Status: California Board of Forestry - Sensitive; Ca – Special Concern Species; Fed - Proposed Threatened/Endangered.

Habitat: Mid- to high-elevation late seral stage conifer forests adjacent to riparian areas, forest openings and habitat edge

Occurrence: North Coast Ranges into Sierra Nevada; Northern Goshawks are known to occur in redwoods, although uncommonly. Six nests have been found (and/or officially documented) in the redwood region of Mendocino and Sonoma counties since 1977:

* Nature Conservancy, found by Greg Grantham (College of the Redwoods Professor) in 1977 (Grantham, pers. comm. 1995).
* Gates Creek (Daugherty Creek) on Louisiana Pacific (1989), found by Kevin Roberts and Malcolm Pious (GP and LP biologists).
* Pudding Creek on Georgia-Pacific discovered by Darcie Mahoney (RPF) in 1991 (J. Ambrose, pers. comm. 1994).
* Maillard Reserve discovered by Brad Valentine (CDF wildlife biologist) in 1994 (Valentine, pers. comm. 1994)
* Northcoast of Sonoma County (Wooster, pers. comm. 1996).
* Successful nest (2 young) on Georgia-Pacific (J. Ambrose, pers. comm. 1997) near Hollow Tree Creek in Mendocino County, discovered by David Hines and Mark Hannon in 1997 (GP biologist and forester).

Habitation Potential: Not applicable in plan area, due to lack of habitat; Moderate within BAA.

Management Considerations: None.

Sources: Zeiner et al. 1990; Bolander and Parmeter 1992; Shuford 1993; Block et al. (eds.) 1994; Ambrose 1994,; Valentine 1994; Goshawk Working Group 1995; Grantham 1995; Wooster 1996; Ambrose 1997.

American Peregrine Falcon (*Falco peregrinus anatum*)

Status: Board of Forestry - Sensitive; Ca – Protected; Ca – Endangered; Fed - delisted on 8/25/99.

Habitat: Aeries (nest locations) occur on rocky outcroppings with a panoramic view of open country. This species is strongly associated in areas with an abundance of passerine, waterfowl or shorebird prey.

Occurrence: Uncommon resident of California.

Habituation Potential: Not applicable in plan area, due to lack of habitat. Moderate within the BAA.

Considerations: None.

Management Considerations: None.

Sources: Zeiner et al. 1990; Bolander and Parmeter 1992; Shuford 1993; Burridge (ed.) 1995.

Osprey (*Pandion haliaetus*)

Status: Ca – Special Concern Species; California Board of Forestry - Sensitive.

Habitat: Forages from lakes, rivers and coastal waters. Nests on top of large snags or man-made structures.

Occurrence: Breeds along the California coast and lino the Sierra Nevada Sonoma and Marin counties.

Habitation Potential: Not applicable in plan area, due to lack of habitat within the BAA.

Considerations: None.

Management Considerations: None.

Sources: Zeiner et al. 1990; Bolander and Parmeter 1992; Shuford 1993; Burridge (ed.) 1995.

Great Blue Heron (*Ardea herodias*) and Great

Status: California Board of Forestry - Sensi

Risk)

Habitat: Water bodies used for fora

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Throughout C

MAMMALS

California Red Tree Vole *(Arborimus pomo=longicaudus)*

Status: Ca – Special Concern Species.

Habitat: Entirely arboreal, they live, den, and feed in the forest canopy. They have been found in Douglas-fir and Bishop Pine and appear to utilize all stand ages (Ted Wooster, pers. comm. 1996 and pers. observ. 1996). This species feeds on Douglas-fir and grand fir needles, and uses the resin ducts from the needles for nest lining.

Occurrence: This species occurs in coniferous forests along the Northcoast of California. No evidence of red tree vole activity has been observed in the plan area.

Habitation Potential: High within plan area and BAA.

Management Considerations: Active nests are easily observable in the tree canopy and matted clusters of resin ducts can usually be found under each nest. Timber will be individually marked, thus each tree can be examined for wildlife nest occurrence. If a tree is found to contain an active nest it will be retained, where feasible. According to Brad Valentine, CDF wildlife biologist, a harvest, which retains a variety of Douglas-fir sizes, may only have negligible impacts to this species (Brad Valentine, pers. comm. 1995). A variety of sizes of Douglas-fir will be retained. Given these management strategies, sufficient protection will be afforded to prevent potential adverse impacts on this species.

Sources: Zeiner et al. 1990.

Point Arena mountain beaver *(Aplondontia rufa nigra)*

Status: Fed – Endangered.

Habitat: Mountain beaver live in underground burrow systems with openings under vegetation (Scheffer 1929), often on steep north-facing slopes or in gullies (Steele 1986). The burrows are found in moist well-drained soil (Ingles 1965). Studies suggest that the most important factors in habitat use are a cool thermal regime, adequate soil drainage, and abundant food supply (Beier 1989), a high percent cover of small diameter woody material, and soft soil (Hacker and Coblentz 1993). Mountain beaver require large amounts of lush vegetation for survival (Voth 1968). Distribution limits are associated with rainfall and soil conditions that promote lush vegetation and high humidity within burrows (Voth 1968).

Occurrence: According to Sarah Flowers the Point Arena mountain beaver has been located north to Irish Beach, south of Point Arena Cove and inland 1 mile.

Habitation Potential: Not applicable in plan area or BAA, due to lack of distribution.

Management Considerations: None.

Sources: S. Flowers (pers. comm., 11/9/99) and DFG publication.

Northern Spotted Owl Consultation

NSO consultation will be submitted prior to second review.

Sensitive Plant Species
The project area is the area in which plant species were assessed.

The California Native Plant Society's Inventory of Rare and Endangered vascular Plants of California (Version 1.5.1) was queried on 11/9/99 for all species occurring in the Navarro quadrangle. Swamp harebell was the only species listed.

No occurrences of sensitive plant species in the plan area or BAA are recorded in the California Department of Fish and Game (DFG), Natural Diversity Database (NDDB).

According to Gordon McBride (botanist who spoke at the May 8th, 1999 THP Preparation Workshop offered through the University of California Cooperative Extension) there are eight plants that are sensitive and are found in the forest environment in Mendocino County. They are small groundcone, leafy reed grass, swamp harebell, water howellia, coast lily, Northcoast semaphore grass, great Burnet and maple-leafed checkerbloom.

Small ground cone *(Boschniakia hookeri),* which has been observed in hardwood coniferous forests is not likely to occur in the plan area due to its limited distribution.

Leafy reed grass *(Calamagrostis foliosa)* is found primarily on rock outcroppings or ocean bluffs. This species appears to inhabit rugged sites, primarily on rock outcroppings and usually along the coast. No such habitat exists within the plan area.

Swamp harebell *(Campanula californica)* and water howellia *(Howellia aquatilis)* are associated with freshwater wetlands. Protection measures designed for springs will afford protection to this species.

Coast lily *(Lilium maritimum)* is associated with coastal prairie or scrub, bogs, and gaps in the closed-cone pine forest. No such habitat exists within the plan area.

Northcoast semaphore grass *(Pleuropogon hooverianus)* is associated with moist grassy areas, wet meadows in montane hardwood-conifer forests, redwood groves, fresh emergent wetlands in annual grasslands and vernal pools. This species is not likely to occur in the plan due to its limited distribution.

Great Burnet (*Sanguisorba officinalis)* and maple-leafed checkerbloom *(Sidalcea malachroides)* are associated with bogs (moist areas) and streams. Protection measures designed for springs and watercourses will afford protection to this species.

Recreational and Visual Resources

The Weir project area is private, on which public recreation is not permitted. No recreational properties or facilities exist within 300 feet of the project area boundary. No Special Treatment Areas exist adjacent to the NTMP, nor does the NTMP exist within a special treatment area.

Along the northern project boundary, homesteads lie adjacent to the project area boundary. Occupants are able to see the north facing slope. Otherwise, the operation will not be readily visible to significant numbers of people.

Due to the high percentage of post-harvest canopy cover, minimal visual impact will occur. To improve aesthetics, all slash within 100 feet or in the line of sight of all roads, main skid trails, and landings will be lopped or bulldozer-crushed to within 30" of the ground. Incidental hardwoods (>7"dbh), near roads and landings, which are damaged during operations will be lopped or skidded to landings. All landings, road edges, and selected trails will be seeded.

Therefore, operations proposed under this NTMP will not produce adverse visual or recreational resource conditions, which contribute to or create a reasonable potential for developing significant environmental impacts when examined singularly or collectively.

Traffic

A daily average of no more than four round-trip truck trips will use this route during logging operations. Depending on where logs will be delivered, from the project area boundary, trucks will travel southwest on Sheep Creek Road to the MRC haul road network to Orr Springs Road or northeast on Sheep Creek Road to Orr Springs Road. At which point, trucks will either travel west to Fort Bragg, east to Ukiah or south to Anderson Valley. Due to the fact that these loads will be spaced throughout the day, it is not expected that traffic congestion will be adversely impacted.

Therefore, operations proposed under this NTMP will not produce adverse traffic conditions, which contribute to or create a reasonable potential for developing significant environmental impacts when examined singularly or collectively.

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APPENDIX A

DEFINITIONS

aggrade	building up of a stream channel by sediment deposition.
anadromous	describes fish that ascend rivers from the ocean to spawn (i.e. steelhead).
basal Area	area in square feet of all conifer stems on an acre.
b.f.	board feet--measure of wood volume 1"x12"x12".
bole	trunk of a merchantable size tree.
CMAI	culmination of mean annual increment.
class I	a.) watercourse with fish present. b.) a domestic water supply.
class II	watercourse providing aquatic habitat for non-fish species (i.e. frogs, etc.).
class III	watercourse with no aquatic life present, but capable of sediment transport.
conifer	softwood, cone-bearing tree species suitable for commercial timber production (i.e. redwood, Douglas-fir).
cord	measure of fuel-wood volume; a stacked cord occupies 128 cubic feet (4'x4'x8'), and contains about 85 cubic feet of solid wood. One cord approximates 500 board feet.
dbh	"diameter at breast height" (tree diameter in inches, measured outside bark 4 1/2' above ground level).
EEZ	Equipment Exclusion Zone.
EHR	Erosion Hazard Rating.
embeddedness	degree of fine sediment among larger gravel that is suitable for fish spawning.
hardwood	non-conifer trees (i.e. tanoak, madrone, maple, live oak, black and white oak).
herbaceous	non-woody seed plant (i.e. grass).
ingrowth	volume increase due to pre-merchantable timber attaining size where board foot volume can now be measured (i.e. 12-14" dbh).
lop	to sever branches and trunks of cut trees so resulting slash will lie close to the ground.
LSS	late seral stage.
LTO	licensed timber operator.
MBF	thousand board feet.

merchantable	sound conifer trees at least 12" in diameter.
net volume	tree volume remaining after deducting unmerchantable and cull material.
NTMP	non-industrial timber management plan.
old-growth	trees older than 175 years.
pre-commercial thinning	cutting in a pre-merchantable conifer stand (2-10"dbh) to reduce unwanted trees and improve growth on remaining trees.
poles	trees 4"-11" dbh.
plugs	seedling stock grown in nursery styrofoam containers.
release	freeing a tree (usually a conifer) from competition by cutting growth (usually a hardwood) surrounding or overtopping it.
regeneration	renewal of a tree crop, either by planting or natural seeding.
residual growth	mature trees (often of lower quality) left after original logging.
riparian	stream-bank and flood plain area along a watercourse.
RPF	Registered Professional Forester.
saplings	trees 1"-4" dbh.
second growth	trees established as seedlings after original old-growth logging; also called young-growth.
seedlings	trees less than 1" dbh.
site index	productive capacity of an area to grow trees, based on height of dominant trees at given age; often expressed as a numeral from I (good site) to V (poor site).
snag	dead standing tree.
stand	tree community sharing characteristics which can be silviculturally managed as a unit.
stand table	graph which shows the number of trees of each diameter class per acre.
stocking	number, or density, of trees in a given area.
stumpage	net value of standing timber to owner, exclusive of logging or trucking costs.
sustained-yield	yield that a forest can continually produce at a given intensity of management.
TPZ	Timber Production Zone (zoning designation).
white woods	grand fir and hemlock.
WLPZ	Watercourse & Lake Protection Zone.
vexar	plastic mesh tube used to protect young trees from animal browsing.

APPENDIX B

INFORMATION AND RESEARCH SOURCES USED IN NTMP PREPARATION

Aerial Photos, WAC Corporation, 520 Conger St.., Eugene, OR 97402-2795, (800) 845-8088
16 March 1996, Photo Numbers. 2-99,100

Aerial Photos, Unknown
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California Department of Forestry and Fire Protection:

- CDF THP Files, Willits, CA 95490
- Cumulative Effects Report, Mark Hannon, 23 Jul 1991
  CDF THP Files, PO Box Drawer F-2, Felton, CA 95018 408-335-5355
- Geology Maps by Mike Manson, Department of Mines and Geology, in 1984
- Director's Memo to RPF's, 8 Aug 1989. Subject: Appurtenant Roads

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Marshall, Jack, CDF Entomologist. ongoing pers. comm. Initiated 12/10/99, California Department of Forestry and Fire Protection, 17501 North Highway 101, CA 95490. (707) 459-7440.

McArdle, Meyer, & Bruce. 1949. "The Yield of Douglas-fir in the Pacific Northwest". USDA, USFS Tech. Bul. 201.

Personal Observations and Data Collection by:

- Craig Blencowe, RPF, 26221 Omar Dr., Ft. Bragg, 95437 707-961-1300
- Linwood Gill, RPF, 26221 Omar Dr., Ft. Bragg, CA 95437 707-961-1300
- Thembi Borras, Apprentice Forester, 25630 Fairbanks Place, Willits, CA 95490 707-459-1039

Schlosser, John, CDF Geologist. ongoing pers. comm. Initiated 11/11/99, California Department of Forestry and Fire Protection, 17501 North Highway 101, CA 95490. (707) 459-7440.

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USDA Natural Resources Conservation Service, 405 Orchard Ave., Ukiah, CA 95482 707-468-9223. Soil Maps and Soil Descriptions.

Weir, Paul and John, NTMP Landowners. 1999-00. ongoing pers. comm. POB 146, Comptche, CA 95427, 707-937-4971.

Weir, Mark and Dana, NTMP Landowners. 1999-00. ongoing pers. comm. POB 372, Comptche, CA 95427, 707-937-5571.

Note: References used to develop the Cumulative Impacts Analysis were also used in the creation of the balance of the NTMP. See section three, References for Cumulative Impacts.

APPENDIX C

PLAN SUBMITTER RESPONSIBILITY LETTER

15 December 1999

John and Paul Weir
Mark and Dana Weir
PO Box 146
Comptche, CA 95427

Re: Non-industrial Timber Management Plan (NTMP)

Dear Folks:

You have been named as the timber/timberland owners on a Non-Industrial Timber Management Plan which has been submitted to the California Department of Forestry and Fire Protection.

As a formality, I am required by law to notify you of the following obligations of the landowner under the Forest Practice Rules:

1. Under the proposed silvicultural systems, a Registered Professional Forester is responsible to insure that trees to be harvested meet the minimum stocking standards (ie. a sufficient number of trees are retained). I verify that your timber stand has been marked to meet these standards.

2. The landowner is responsible for maintaining erosion control structures (ie. waterbars, etc.) for at least one year after CDF has issued a certificate of completion for current operations on the NTMP.

3. Timber marking is required when harvesting within a watercourse protection zone or a special treatment area.

None of these provisions should be a problem in the proposed NTMP.

Regards,

Craig Blencowe
Registered Professional Forester
License No. 2003

DOMESTIC WATER SUPPLY NOTIFICATION

Letters were sent requesting information on domestic water supplies to all property owners within 1000 feet downstream of the project boundary. Three responses were received:

- Kathy Shields called on the behalf of the Tobias family. They have an underground well from which they extract water for their homestead. The well is located approximately 500 feet north of Johnson Creek. As all harvest operations will be confined south of Johnson Creek, the resource is not at risk.

- Buffy Maples called on behalf of Comptche Community Farms. They also have an underground well from which they extract water for their homestead. It is located approximately 600 feet north of Johnson Creek. As all harvest operations will be confined south of Johnson Creek, the resource is not at risk.

- Russ Delong called on behalf of the John Hammerman partnership. They receive water for their homestead from a spring located in Johnson Creek no less than 800 feet from the plan area. As the plan area does not drain upstream of the domestic water supply and given the considerable distance from the plan area, the resource is not at risk.

In compliance with the Forest Practice Rules, see Appendix C for the following :

1. Sample letter and Project Location Map from RPF to property owners within 1000 feet downstream of the project boundary requesting information concerning domestic water supplies.

2. Proof of publication of Notice in Mendocino Beacon.

Craig Blencowe
Consulting Forester

26221 Omar Drive • Fort Bragg, CA 95437 • (707) 961-1300

28 October, 1999

Philbrick Family Partnership
8867 North Fuller Court
Fresno, CA 93720

SAMPLE

Dear Philbrick Family Partnership:

We are preparing a Non Industrial Timber Management Plan (NTMP) for owners of private property in the North Branch North Fork Navarro River watershed, located approximately 4 air miles South and East of the town of Comptche, CA in Mendocino County. The project area is located in portions of the SE 1/4 of Section 21, S1/2 of Section 22, N1/2 of Section 27 and the NE1/4 of Section 28; T16N; R15W; MDB&M. Watercourses that may be affected include John Smith Creek and its tributaries, Johnson Creek and Gulch 15 (or Sheep Creek). John Smith Creek is a tributary to the North Branch North Fork of the Navarro River. Enclosed is a map, on which the project area is delineated. The project location can be located on the USGS Navarro 7.5' quadrangle map.

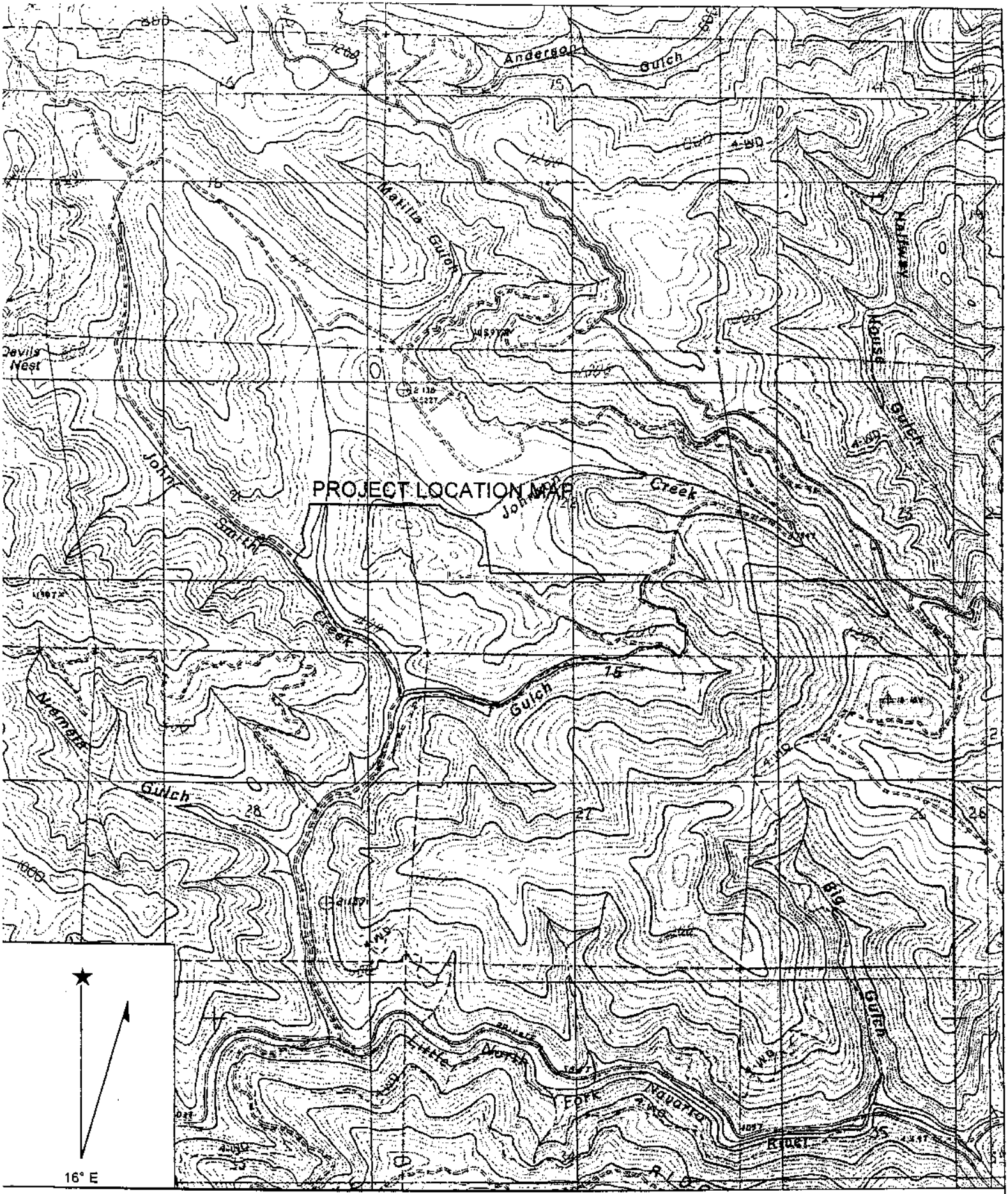
Your property has been identified as being within 1000 feet downstream of the proposed project area. This letter is to request information about domestic water supplies from Class I, II, III and IV watercourses that receive drainage from the NTMP area and are within 1000 feet downstream of the project boundary. If you are aware of any downstream domestic water supplies, which may be affected by this NTMP, please notify us within ten days of this notification.

If you have any questions regarding this request, please contact me at 25630 Fairbanks Place Willits, CA 95490. My telephone is (707) 459-1039.

Sincerely,
Craig Blencowe, Consulting Forester RPF# 2003

Thembi T. Borras, Forester

Enclosure



Name: NAVARRO
Date: 10/27/99
Scale: 1 inch equals 2000 feet
——: PROJECT BOUNDARY

Location: 10 454608 E 4341936 N
Caption: WEIR NTMP
Portions of S. 21, 22, 27 and 28; T16N; R15W; MDBM
Contour Interval: 40'

PROOF OF PUBLICATION

(2015.5..C.C.P.)

This space is for the County Clerk's Filing Stamp

STATE OF CALIFORNIA

County of Mendocino

I am a citizen of the United States and a resident of the County aforesaid: I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the Office Clerk of the Mendocino Beacon, a newspaper of general circulation, published weekly in Mendocino, County of Mendocino, State of California, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Mendocino, State of California under the date of June, 1953 - Case Number 9465, that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been printed in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

November 4

all in the year 1999

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Mendocino, California this 4th day of November, 1999

J. Fisher

Signature

PROOF OF PUBLICATION
MENDOCINO BEACON

Proof of Publication of

REQUEST FOR INFORMATION ON DOMESTIC WATER SUPPLIES

PUBLIC NOTICE

REQUEST FOR INFORMATION ON DOMESTIC WATER SUPPLIES

A Non Industrial Timber Management Plan (NTMP) will be submitted to the California Department of Forestry and Fire Protection in portions of the SE 1/4 of Section 21; S1/2 of Section 22, N1/2 of Section 27 and the NE1/4 of Section 28; T18N, R15W; MDB&M. The proposed project area is located approximately 4 air miles South and East of the town of Comptche, CA in Mendocino, County. This notice is to request information about domestic water supplies from Class I, II, III and IV watercourses that receive drainage from the NTMP area and are within 1000 feet downstream of the project boundary. Watercourses that may be affected include John Smith Creek and its tributaries, Johnson Creek and Gulch 15 (or Sheep Creek). John Smith Creek is a tributary to the North Branch North Fork of the Navarro River. If you are aware of any downstream domestic water supplies, which may be affected by this NTMP, please contact (within ten days of this notification):

Thembi Borras
25630 Fairbanks Place

THE MENDOCINO BEACON
A Coast Paper for Coast People Since 1877
P.O. Box 225
Mendocino, California 95460

Appendix D

CONFIDENTIAL ADDENDUM-ARCHAEOLOGY