

**Section IV**

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**SECTION IV**  
**CUMULATIVE IMPACTS ASSESSMENT CHECKLIST**  
**STATE OF CALIFORNIA BOARD OF FORESTRY AND FIRE PROTECTION**  
**CUMULATIVE IMPACTS ASSESSMENT**

**(a)** Do the assessment area(s) of resources that may be affected by the proposed Project contain any Past Projects, or Reasonably Foreseeable Probable Future Projects? Yes  X  No

If the answer is yes, identify the projects (s) and affected resource subject(s).

**Timber harvesting, agriculture, vegetation management, recreation, and rural residential development. See Technical Rule Addendum # 2 Item A.**

**(b)** Are there any continuing, significant adverse impacts from past land use activities that may add to the impacts of the proposed project? Yes  X  No   If the answer is yes, identify the activities and affected resource subject(s).

**Soil Erosion. See Past and Future Activities and Addendum # 2 Item B.**

**(c)** Will the proposed project, as presented, in combination with past, present, and reasonably foreseeable, probable, or 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 (1)	No after mitigation (2)	No reasonably potential significant adverse impact (3)
(A) Watershed			<b>X</b>
(B) Soil Productivity			<b>X</b>
(C) Biological			<b>X</b>
(D) Recreation			<b>X</b>
(E) Visual			<b>X</b>
(F) Traffic			<b>X</b>
(G) Greenhouse Gases (GHG)			<b>X</b>
(H) Wildfire Risk and Hazard			<b>X</b>
(I) Other ( <i>Noise, S.O.D., Fog Drip</i> )		<b>X</b>	

1) "Yes, after mitigation" means that potential significant adverse Cumulative Impacts are left after application of the Rules and mitigations or alternatives proposed by the Plan Submitter.

2) "No after mitigation" means that any potential for the proposed Timber Operation to cause or add to significant adverse Cumulative Impacts by itself or in combination with other Projects has been reduced to insignificance or avoided by mitigation measures or alternatives proposed in the Plan and application of the Rules.

3) "No reasonably potential significant adverse Impacts" means that the operations proposed under the Plan and application of the Rules do not have a reasonable potential to join with the Impacts of any other Project to cause, add to, or constitute significant adverse cumulative Impacts.

## TECHNICAL RULE ADDENDUM NO. 2 CUMULATIVE IMPACTS ASSESSMENT

The purpose of this addendum is to guide the assessment of cumulative impacts as required by 14 CCR 898 and 1034 that may occur as a result of the proposed timber operations. This assessment includes an evaluation of both on-site and off-site interactions of the proposed project activities with the impacts of past and reasonably foreseeable future projects.

### Identification of Resource Areas

- A. Watershed Resources** - The Watershed Assessment Area (WAA) for watershed resources includes the Willow Creek Planning Watershed, Calwater PWS 1114.110401. This planning watershed is approximately 11,565.5 acres and is the WAA used in this analysis. The WAA area is used to assess the impacts primarily due to timber harvesting, agriculture, development, and related activities. A map is provided.

*Rationale:* This assessment area is consistent with the January 7, 1992 CDF recommended guidelines to RPFs which states: "The watershed assessment area for assessing cumulative watershed effects should be selected to include an area of manageable size (usually an order 3 or 4 watershed) relative to the THP that maximizes the opportunity to detect an impact".

- B. Soil Productivity Resources** - The assessment area for soil resources is defined by the NTMP area within which impacts to this resource will be confined.

*Rationale:* Technical Rule Addendum NO. 2 "These Impacts most often occur on-site within the Project boundary..."

- C. Biological Resources** – The assessment area for biological resources will vary based on Plan habitat and surrounding species and populations. The Biological Assessment Area (BAA) used for the NTMP consists of a .7 mile radius around the plan.

*Rationale:* This conforms to the provincial survey radius around proposed projects used for assessing impacts to northern spotted owl. A map is provided.

- D. Recreational Resources** - The recreational assessment area boundary is the NTMP area and within 300 feet of the NTMP boundary.

*Rationale:* Technical Rule Addendum NO. 2

- E. Visual Resources** - The visual assessment area is defined as those parts of the NTMP area that are readily visible to significant numbers of people within three miles of the NTMP boundary

*Rationale:* Technical Rule Addendum NO. 2

- F. Vehicular Traffic Impacts** - The assessment area for traffic is the driveway through the Mann property, Highway 116, River Road, and Highway 101.

*Rationale:* The driveway is owned by the County of Sonoma but is gated at the intersection with Highway 116 by the property owners. The driveway and Highway 116 are the first public roads on which log trucks would travel from the NTMP area

*to other destinations.*

**G. Greenhouse Gases (GHG)/Climate Change** - The assessment area for climate effects is the NTMP area and the public transportation routes for delivery of logs. The analysis is based on the CO<sub>2</sub> emission and sequestration rates from timber operations, specifically timber falling and other chainsaw use, yarder operation, skidding, other tractor work such as road maintenance, loading, and log hauling. Calculations are in Section V, Project Carbon Accounting.

***Rationale:** All carbon sequestration is limited to the plan area. This is also true for most but not all emissions generated by the proposed project. Those emissions associated with the project but not created within the plan boundary, log delivery, and processing at the mill, are accounted for in the GHG Calculator.*

**H. Wildfire Risk and Hazard** – The assessment area for wildfire risk & hazard is the NTMP boundary plus 200’.

***Rationale:** This area and distance are based on the area where fuels will be directly influenced, and from the interpretation of the rule relating to hazard reduction. Just as slash created within 200 feet of a structure is considered to be a fire hazard by the Board of Forestry, 200 feet from slash created by timber operations is considered in this NTMP to be the highest fire hazard area.*

**I. Other:**

**Noise** – The assessment area for noise is the NTMP area and surrounding areas within ¼-mile. This is the area that would be potentially impacted by noises generated from project activities.

***Rationale:** This area is the noise buffer distance applied to northern spotted owl activity centers during the breeding season which should be sufficient for humans who are generally less sensitive.*

**Sudden Oak Death** (*Phytophthora ramorum*) – The assessment area is downstream of the NTMP and within 1,000 feet of watercourses flowing from the NTMP.

***Rationale:** Spores travel in water and wind driven rain and most new infections from wind dispersal occur within 1,000 feet of infected trees. Spores can travel much farther in extreme wind. Long distance spread is typically by movement of infected plant material or soil (Kliejunas, 2010) which is minimized or avoided by best management practices required by the NTMP.*

**Fog Drip** – The assessment area is the NTMP boundary.

***Rationale:** The greatest impact from fog drip is to the immediate ground vegetation and duff layer underneath the trees.*

## Identification of Information Sources

Information was obtained from personal communications with Matt Greene, former RPF of record for THPs and Exemptions within the proposed NTMP area. Bruce Berry, who oversees the property which has been in the family since 1979, Jim Berry, forester and assistant property manager, Robert

(Bob) Mann, adjacent landowner with a shared right of way, and Ernest (Ernie) Ricioli, adjacent landowner. In multiple verbal and email communications these sources anecdotally described history of the NTMP and immediate surrounding area. These communications gave a sense of harvest frequency including other neighboring ownerships which pertains to the number of truck loads coming and going on the highways. They also gave accounts of recreational use of the area. Their contact information is included in References at the end of this Section.

Records examined include but are not limited to soil maps, aerial photographs dating back to the 1950's, digital and printed plan records within the proposed NTMP boundary and topographic maps. Agency documents examined include but are not limited to the FRAP historical fire perimeter dataset, CAL FIRE THP, NTMP, NTO and Exemption GIS datasets, soil-vegetation maps prepared by the California Forest and Range Experiment Station and the University of California. Please see cumulative impacts assessment references at the end of Section IV for a complete listing.

### ***Past and Reasonably Foreseeable Future Projects***

#### **Identify and describe past and probable future projects within the assessment areas**

#### **PAST PROJECTS**

##### Timber Harvest:

The Russian River resort area of Sonoma County has historically combined agricultural and timber management activities with high-use recreation activities centered on the river. The plan area has been in the hands of Berry family going back to 1979 (THP 1-08-025-SON). It is currently under the ownership of the Loren and Beatrice Berry Trust and is overseen by Bruce Berry.

Most of the timber on the property was likely clearcut logged in the late 1800's or early 1900's when it was owned by Andrew Markham. A spur of the North Pacific Coast Railroad was completed from Duncans Mills to Markham in 1882 and was abandoned in 1925 (The Northwestern Pacific Railroad: Redwood Empire Route). At least six sawmills (Markham's, Dollar, Liberty, Fuller, VonArx, Sheer) operated in Sheephouse Creek watershed between 1870 and 1965 (THP 1-12-040-SON). The Fuller and Laton sawmills burned in the 1923 fire, the Sheer sawmill burned in the 1965 fire and none were rebuilt. The property was tractor logged repeatedly between 1953 and 1971, as evidenced by aerial photographs. Several harvests took place on the property in the 1980's, as indicated by CAL FIRE's mylar overlays on USGS maps available at the Ridgeway office. The earliest available plan for the property, 1-01-105-SON, and all THPs on the property since that date (1-02-129-SON, 1-03-073-SON, 1-03-146-SON, 1-05-099-SON, 1-08-025-SON, 1-12-040-SON) have utilized selection silviculture, with Special Treatment Area silviculture applied where required. Harvesting has continued to this day, and the property supports young growth forest stands with few scattered residual trees.

This property is a good indicator of the timber harvesting in the overall WAA. Many mills operated within the WAA in the late 1800's and early 1900's but overharvesting and the 1923 fire that swept from Guerneville to the coast effectively ended that era of timber harvesting. The common practice for timberland owners in the mid 1940's until the adoption of the Timber Yield

Tax in 1977 was to selectively cut at least 70 percent of the volume from an area; State law at that time provided that the remaining timber was then taken off the tax rolls for the next 40 years. Aerial photographs from the 1950's to present of the surrounding areas show continued harvests on private property, with harvests being discontinued in areas acquired by the State of California for parks.

Although specific early management practices used on the property are unknown, range managers typically would burn their rangeland at periodic intervals to eliminate brush and retain the grass cover. Throughout the Russian River region, grazing with sheep or cattle has been conducted either through ownership or under grazing rights or a lease.

### Road and Rail Building:

The earliest road network on the property was designed and constructed primarily for harvesting timber. The spur of the North Pacific Coast Railroad that went to Markhams had several incline rails built throughout the area. This infrastructure facilitated the logging done during the first era of the timber industry in Sonoma County.

The main access roads have been improved and upgraded since the Berry's took ownership in 1979 within the Forest Practice Rules framework, with additional work being done in 2015 in conjunction with the Sotoyome Resource Conservation District as part of the Sheephouse Creek Sediment Reduction Implementation Project.

### Recent and Current Projects:

The WAA is located along Highway 1 and bisected by Highway 116. It is made up of both public and private land ownership. The WAA is located primarily in a rural setting with roads that receive low travel, such as Willow Creek Road and Coleman Valley Road.

The Willig ranch surrounds areas used for ranching activities such as cattle grazing, but the property itself is predominantly timbered. Friends and family sometimes hunt on the property, at the discretion of the Berry family. Human traffic and activities are generally low on the property.

Rural residential home sites occur within the WAA. They are primarily concentrated along Highway 1 in Jenner, CA, population 122 (2020). The town consists of multiple businesses supported by people attracted by recreational opportunities in the area. Rural residential use, measured by population, declined by 10.2% from 2010 to 2020 according to census data.

Cattle grazing occurs in the WAA at a low to moderate level. There are some expanses of grassland scattered throughout the WAA that are still used for pastoral purposes.

Timber harvesting is *common* in the WAA. This NTMP is intended to assist the landowner in managing the property *as a comprehensive unit rather than in a piecemeal fashion. The amount of harvesting would not increase under an NTMP but it would provide for a sustainable level of harvesting in the context of the entire ownership allowing only selection silviculture.* Most recently, a THP and exemptions have been used for fuel reduction and timber harvesting activities on the

property. Using the Forest Practice Watershed Mapper v2, three other THP's were identified as being approved in the Willow Creek Planning Watershed within the last 10 years. A separate proposed NTMP is currently under review. Please refer to Table 1 for a summary of the plan numbers, acres, silvicultural and yarding methods, and approximate location.

**Table 1: Willow Creek Planning Watershed  
Calwater version 2.2.1 PWS #1114.110401  
Proposed, Current, and Past 10 years Timber Harvest Plans (since 2014)**

THP #	Acres in WAA	% Of WAA	Silviculture	Yarding	Status	General Location (MDBM)
<b>Proposed</b>						
1-25NTMP-00001- SON (This plan)	1099	9.50	Selection, Special Treatment Area, No Harvest	TR/Cable	This plan	Portions of Projected Sections 5, 7, 8, 9, 17, 18 T7N, R11W Muniz Rancho MDBM
1-25NTMP-00004-SON	93	0.80	Selection, Special Treatment Area, No Harvest	TR/Cable	NTMP review in progress	Portions of Projected Sections 30 & 31 T7N R10W Bodega Rancho MDBM
<b>Past</b>						
1-20-00160-SON	39	0.34	Selection	TR/Skidder	Approved	Portions of Projected Section 24 T7N R11W Portions of Projected Sections 19, 29, 30 T7N R10W Bodega Rancho MDBM
1-16-114-SON	8	0.07	Selection	TR/Cable	Approved	Portions of Projected Sections 3, 4 T7N R11W Muniz Rancho MDBM
1-15-065-SON	54	0.47	Selection	TR/Skidder	Approved	Portions of Projected Sections 5, 6, 7 T8N, R11W Muniz Rancho MDBM
1-12-040-SON Approved in 2018	90	0.78	Selection	TR/Skidder Cable, high lead	Approved	Portions of Projected Sections 7, 8, 17 T7N, R11W Muniz Rancho MDBM
1-23EX-00663-SON	35	0.30	Forest Fire Prevention	TR/Skidder Feller Buncher	Approved	Portions of Projected Sections 5, 7, 8 T7N, R11W Muniz Rancho MDBM
1-21EX-01114-SON	34	0.30	Forest Fire Prevention	TR/Skidder Feller Buncher	Complete	Portions of Projected Sections 7, 8, 17 T7N, R11W Muniz Rancho MDBM
<b>TOTAL</b>	1452	12.56				

The proposed plan accounts for 9.50% of the WAA.

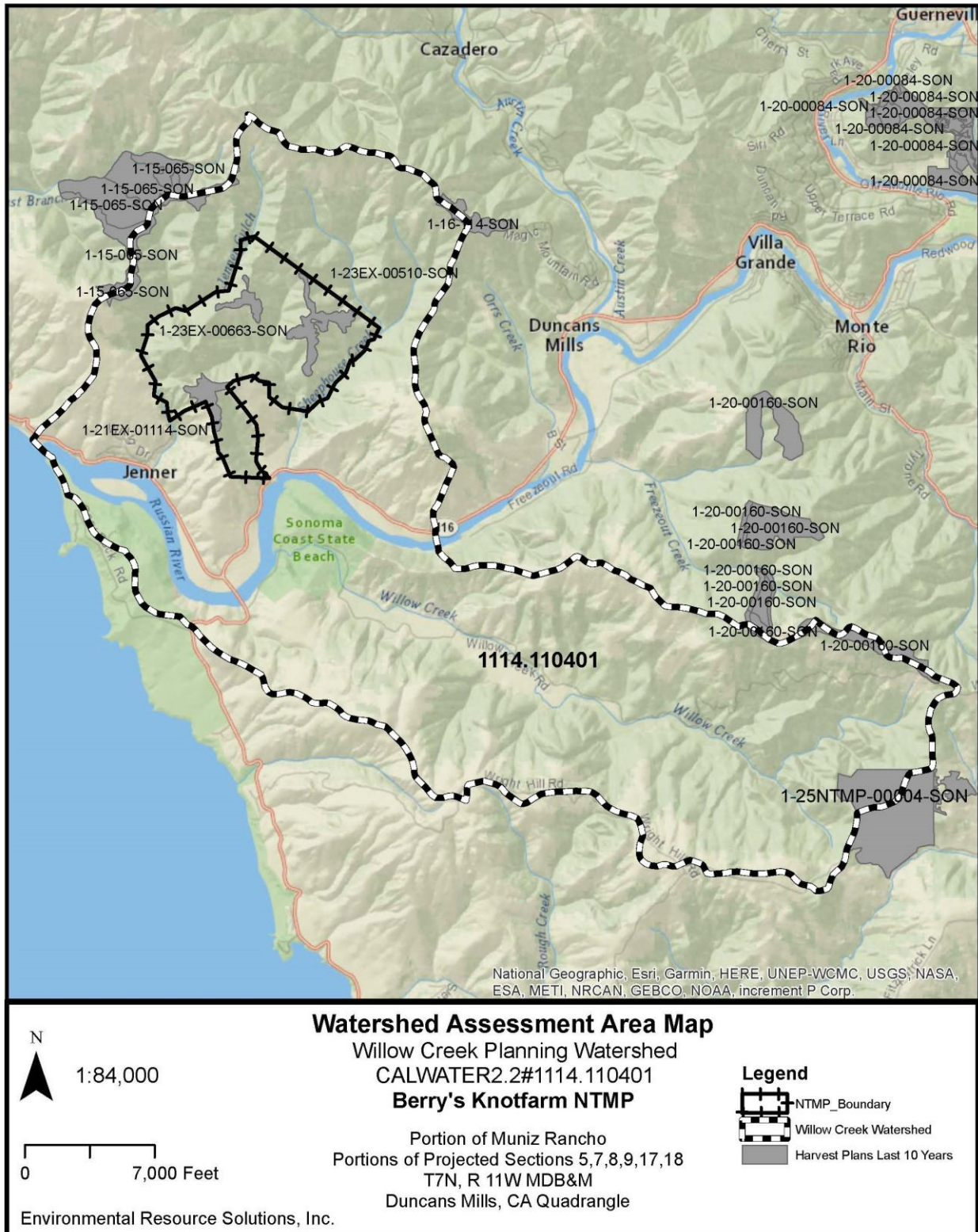
Watercourse Rehabilitation:

The Berry family has taken an active role in restoring the Sheephouse Creek drainage since acquiring the Willig property. *This is both a past project and a current project.*

Stream inventory on Sheephouse Creek was completed by Americorp and Bob Coey of Dept. of Fish and Game (in 1996) and in 2003 with DFG supervision from Russian River Restoration

Biologist, Derrick Acomb. The final draft of the first "California Department of Fish and Game Stream Inventory Report" was completed December 30, 1998 (15 pp.). Summer temperatures were monitored by Berry's Sawmill from 1996 to 2005 and since 2004 by the U.C. Extension research team lead by Mareska Obedzinski. Fish access and persistent populations of steelhead have been surveyed in 1993, 1996, 2000 and 2003 by DF &G, and by Sonoma Co. Water Agency in 2000. According to David Manning, biologist for the Sonoma Co. Water Agency, fish numbers in Sheephouse should be at least five fold, considering the habitat.

Coho Salmon from Warm Springs Hatchery were placed in Sheephouse Creek in October 2004, April 2005, October 2005, April 2006, October 2006 and April 2007. *Tens of thousands of Coho* have been stocked so far. The transportation crew worked under supervision of Warm Springs Hatchery biologists Louise Conrad and Ben White from Dept. of Fish and Game's Inland Fisheries Division. They have been placed in 60+ suitable pools. *California Conservation Corps* constructed natural structures made of logs and root wads over a 1 ½ mile section of Sheephouse. Many young coho have been counted with fish traps leaving Sheephouse Creek but few if any carcasses and redds have been discovered so far.



Considerable resources of time and materials have been expended since 1978 to minimize human caused sediment on Sheephouse Creek, both within the channels and upslope. High intensity storms have been especially problematic for the Sheephouse channel because of high, soft, steep sides which "slab off" in high water. The channel depends on root armor and has no

boulders for protection. Seventy-five new culverts upslope, coupled with water bar monitoring have steadily reduced sediment yield. Twenty-five to 30 new large wood structures were placed in 1997-98, which have helped armor banks and encouraged the of new, larger and deeper pools which are now providing improved salmonid cover. No anchored structures have failed but a few unanchored structures failed to stay in place.

In October, 2007, two Sheephouse Creek bank failures from the Winter of 2005-2006 were repaired by California Conservation Corp. members. Boulders and logs donated and transported by Berry's Sawmill were used to create 2 "boulder wing deflectors" which deflected the centrifugal force of Sheephouse away from the steep banks. The boulders were connected together with stainless steel cable and set into the boulders with epoxy glue. The boulders also anchored cross logs for pool creation. Several new natural weirs and whole tree structures are continuing to improve habitat.

The class I portion of Willig Gulch has considerable LWD, boulders and bedrock pools. Canopies (from the Survey on Willig Gulch) average 90-100% before harvest and after Alder leaves have fallen. A pre-harvest canopy survey for Willig Gulch (35 plots) averaged 96%, as determined with a spherical densiometer.

#### Fire Hazard Reduction:

*Several fuel breaks have been installed and prescribed burns conducted in the WAA in Jenner Headlands Preserve owned by The Wildlands Conservancy and in Sonoma Coast State Park.*

#### **FUTURE PROJECTS**

According to the Sonoma County Permit and Resource Management Department, rural areas of Sonoma County have an approximate 37% parcel development ratio. New developments will be limited by restrictions from local ordinances.

Primary visitors to the Jenner area are expected to maintain current levels or increase slowly along with the population of coastal California *and the popularity of the area as a tourist attraction.*

Horse, sheep, and other livestock grazing is expected to continue at low levels and may decrease in the future due to land use changes.

Future timber harvesting and fuel breaks are expected to be implemented in the WAA to reduce wildfire potential and spread and rehabilitate forests. Coast Ridge Community Forest is planning a shaded fuel break that may include a portion of this NTMP area but the exact location is unknown and the project is not funded at this time. This proposed NTMP and another proposed NTMP *submitted by Environmental Resource Solutions, Inc. have been included in Table 1 as proposed projects. Coleman Valley Ranch NTMP, 1-25NTMP-00004-SON, is partially within the Willow Creek Watershed would presumably be harvested from time to time under Notices of Timber Operations (NTOs). Road and stream crossing maintenance would be conducted with each NTO. Only selection (82 acres) and special treatment (140 acres) silviculture are proposed for the NTMP.*

Watershed effects will be minimized through installation of proper erosion control facilities such as waterbars, straw mulch, and slash packing on skid trails and landings. These measures will help ensure rainfall interception is high *minimizing the likelihood of soil being transported* into stream channels as sediment.

*Properties may continue to be purchased by conservation organizations and may subsequently be open for public access. Acquired land may undergo restoration management, fire hazard reduction, trail or other recreational infrastructure building, resource extraction, or no management. Trespass may or may not be actively controlled.*

### **Identify any known and continuing environmental problems from past projects.**

The forest practices prior to 1973 were conducted with little concern for the long-term impacts of logging operations. Historically, portions of the WAA have been adversely impacted from past logging methods that utilized watercourse channels for the primary and secondary transportation of logs. This, in conjunction with land conversion to grassland, improper road drainage and maintenance, slash burning, and other historical practices may continue to impact the WAA.

Historical residential development and ranching in the WAA have resulted in road building, conversion of timberlands, habitat loss and fragmentation, and increased wildfire risk and other threats to the watersheds. These impacts have likely contributed to continuing environmental problems such as sedimentation, flooding due to rural residential development, reduced water levels from domestic supplies, nutrient loading from agriculture and incidental landscape maintenance, and possible chemical contamination from agriculture and/or rural residential septic, among other environmental problems associated with rural residential development.

Northwest Sonoma County is known for illegal outdoor cannabis cultivation. Cannabis in the WAA has the potential to disrupt the ecosystem by converting timberland, use of pesticides, herbicides, fertilizers, and trash accumulation. *No cannabis cultivation is known in the WAA.*

A known continuing environmental problem from these past projects is the delivery of sediments into the main drainages in the assessment area. *Perched fill from past grading continues to erode except for locations where it has been stabilized.* It is acknowledged that soil erosion has potentially caused pre-plan adverse cumulative watershed effects on the populations and habitat of anadromous salmonids in the assessment area. This issue has been repeatedly addressed within the NTMP boundary in post-Forest Practice Rules harvest plans, and the landowners have additionally worked with the Sotoyome Resource Conservation District to mitigate these effects in the Sheephouse Creek watershed. This *NTMP* has proposed measures to effectively reduce such effects wherever operations occur *and other locations within the NTMP boundary that have been deemed "high priority" regardless of operation timing.*

## **Appendix Technical Rule Addendum # 2**

### **A. WATERSHED RESOURCES**

The Watershed Assessment Area (WAA) is the Willow Creek Planning Watershed. The plan area is

located entirely within this planning watershed. The Willow Creek Planning Watershed is located just inland from the Pacific coast in Sonoma County. The watershed is forested with intermixed grassland areas. This watershed is comprised of small residential parcels in and around the community of Jenner and larger parcels mostly privately owned or by the State of California. Timber companies own several parcels in the southern part of the watershed. This watershed has a history of timber harvesting and future timber operations are planned.

The Willow Creek Planning Watershed is within the Coastal Anadromy Zone. Sheephouse Creek and Jenner Gulch are designated as Steelhead Critical Habitat (NOAA [ds122])

The Willow Creek Planning Watershed contains EPA 303(d) listed waterbodies for sediment/siltation and temperature. Sediment impacts in the Russian River tributaries prompted listing the entire Russian River Watershed for sediment TMDL. Both listings give the sources of pollutant as flow alteration/regulation/modification and removal of riparian vegetation.

Parts of the NTMP are Coastal Commission Special Treatment Areas (CCSTAs). Special management objectives considered essential for the protection of public values are identified in 14 CCR 895.1 by sub watershed and are discussed below.

- Jenner Gulch public values include (C.) wetlands, lagoons, streams, estuaries, and marine environments. To protect these values, watershed effects are assessed below. Additional values include (D.) significant animal and plant habitat areas. Protection of these values is assessed under Biological Resources in this Section.
- Sawmill Gulch public values include (A.) Scenic View Corridors which is assessed under Visual Resources in this Section.
- Sheephouse Creek public values include all of those listed in the other two sub watersheds (A, C, and D).

**1. Watershed effects from timber harvesting and other activities**, which may include one or more of the following:

**a. Sediment Effects:**

Sediment-induced Cumulative Watershed Effects (CWEs) occur when earth materials transported by surface or mass wasting erosion enter a stream or stream system at separate locations and are then combined at a downstream location to produce a change in water quality or channel condition. The eroded materials can originate from the same or different projects. Potentially adverse impacts are most likely to occur and can be observed in the following locations and situations:

- Downstream areas of reduced stream gradient where sediment may be deposited;
- Immediately downstream from where sediment exceeds the transport capacity of the stream;
- Any location where sediment significantly reduces the survival of fish or other aquatic organisms or reduces the quality of waters used for domestic, agricultural, or other beneficial uses;

- Channels with relatively steep gradients that can result in debris torrents or severe channel scouring.

Potentially significant adverse impacts of cumulative sediment inputs may include:

- Reduced suitability or increased treatment for municipal, domestic, or agricultural water use;
- Direct mortality of aquatic species;
- Reduced viability of aquatic organisms or disruption of aquatic habitats and loss of stream productivity caused by filling of pools and plugging or burying streambed gravel;
- Accelerated channel filling (aggradation) resulting in loss of streamside vegetation and stream migration that can cause accelerated bank erosion.
- Accelerated filling of downstream water diversion and transport facilities;
- Channel scouring by debris flows and torrents.

Situations where sediment production potential is greatest include:

- Sites with high or extreme erosion hazard ratings;
- Sites which are tractor logged on steep slopes;
- Unstable areas;
- Failed watercourse crossings

### Past Projects

*Road and watercourse crossing construction:*

*Roads were originally placed where the gradients were most favorable. Prior to the availability of bulldozers, roads were often constructed along watercourses where fill could be placed in the channel with the assistance of gravity and along flood plains. Settlements were often developed in the same low-lying locations because there was enough level area to place several structures such as homes, stores, post offices, schools, etc. Many of those roads and crossings washed out during rain events and were simply reestablished as needed. Many of those legacy roads remained in place long enough to be somewhat stabilized and are still in use today. Many historic travel routes are now public roads needing constant maintenance, repair, and upgrading. This practice was thought to be favorable as opposed to the complication and expense of constructing new alignments upslope.*

*Following World War II, bulldozers became widely available. Landowners and managers were then suddenly able to build roads almost anywhere which was often the shortest distance from one desired location to another. Erosion, preservation of topsoil, and sedimentation were not usually considerations. Most people had not yet seen the delayed effects to wildlife populations and did not anticipate it. When roads on steep slopes failed, they were simply rebuilt as needed for the short term. The impacts have since been thoroughly studied. Weather data allows for more precise predictions and calculations. Technology and engineering advances have allowed more stable roads to be designed and built. Road maintenance in the NTMP area and throughout the WAA results in much less sedimentation and stabilizes legacy sediment sources.*

*Timber Harvesting, Milling and Lumber Production:*

*Logging practices occurring prior to the Forest Practice Act likely impacted the entire Willow Creek watershed, including the NTMP area. Effects of those activities are still present within the*

*project area in the form of perched fill, overly steep cutbanks, and altered drainage. Early logging practices consisted of oxen logging, steam donkey logging often within or adjacent to watercourses utilizing gravity to bring logs to watercourse channels and level floodplains for skidding. When powerful tractors became available and old growth was still the primary target of loggers, layouts were often built. Layouts are pads constructed by grading and leveling to minimize tree breakage, maximizing merchantable wood recovery. Layouts became much less common as the old growth resource has been eliminated or protected. Smaller trees available for harvest today are not as heavy, resulting in less breakage. Layout construction must be necessary to be permitted and is usually more expensive than the revenue from additional wood volume would yield. Activities in the last 10 years included logging in compliance with the Forest Practice Act and Rules including watercourse protections, avoidance of saturated soil conditions, and treatments to disturbed bare soil.*

*A sawmill was located in Sawmill Gulch from approximately 1880 to 1923. A large earthen dam was constructed to create a pond to support the milling operation. This dam has filled in with sediment creating a wet area that is slowly deteriorating partly due to the watercourse above recreating a channel through the fill. The fill material is expected to eventually reach the watercourse channel below. If the dam was removed there would be a sudden flush of sediment directly to the watercourse which would likely fill its stream bed gravel. A railroad was operating in Sawmill Gulch at the same time, transporting logs to another sawmill in Jenner. The railroad was located along watercourses as it ascends to the ridge and descends to Jenner. The railroad is abandoned and the bed of the road has been slowly eroding, continuing today.*

#### *Wildland burning:*

*Broadcast burning was a common practice for rural landowners in the WAA until the 1950s. The purposes included disposing of logging slash, opening land for livestock grazing or other development, greater visibility, and general maintenance of overgrowth. Burning would be expected to initially cause sedimentation for the first year or two until enough vegetation grew in to cover bare soil and slow and disperse overland flow. It is doubtful that those historic burn activities are causing ongoing problems. With fire suppression since the practice of broadcast burning was widespread, middle and understory vegetation has become overgrown and senescent.*

#### *Agriculture/Grazing:*

*Farming and livestock grazing were dominant land uses in the past and continue today. Homesteads existed where permanent water, natural open areas and level ground allowed for subsistence farming. Commercial sheep and cattle grazing was a primary land use in the WAA. Past grazing by livestock resulted in the destruction of streamside vegetation and minor gully erosion. It is unlikely that legacy grazing practices are having cumulative impacts today.*

*More recent past activities in other areas of WAA where timber harvesting does not occur include highway, recreational, and residential infrastructure maintenance and upgrading.*

#### *Current and Ongoing Projects*

- *Little to no development is occurring within the WAA.*

- *Land stewardship and maintenance are ongoing.*
- *Timber harvesting occurs on various ownerships in the WAA including on the parcels that make up this NTMP area.*
- *Lands are being acquired by conservation organizations and parks.*
- *Recreation activity continues at a steady rate.*
- *Fuel breaks are being installed at a growing rate throughout the WAA but not on the property included in this NTMP.*
- *Prescribed burning is being conducted at an increasing rate.*
- *Highway maintenance is ongoing.*
- *Cattle grazing is still occurring on Jenner Headlands Preserve, this NTMP property, and the adjacent property to the south. It is not known if grazing is currently occurring on other lands in the WAA.*

### Future Projects

*Reasonably foreseeable probable future projects are similar to current and ongoing projects. Other landowners in the WAA are eligible for NTMPs and THPs. NTOs are planned under this NTMP. If not under an NTMP, timber harvesting is likely to be conducted using THPs or exemptions. Net sediment impacts could be reduced with maintenance, repairs, and upgrades to potential sediment sources as conditions of obtaining permits.*

#### *Berry's Knotfarm NTMP:*

*Timber harvesting is likely to be conducted on this NTMP property and others within the WAA whether the NTMP is in effect or not. The practices proposed in this NTMP are likely to be the same or similar to timber harvesting on other properties in the WAA. The following addresses potential sediment impacts specifically associated with this NTMP.*

- **Controllable sediment discharge sources (CSDS):** CSDS have been identified and mapped within the NTMP and measures have been proposed to prevent or minimize potential discharge. Watercourse crossings of roads and other road related sites deemed CSDSs are described in Section II, Item 24 – 25 including their imminence of failure and upgrade implementation priority (IP). Upgrades to those sites described as high IP will be implemented with the first NTO under the approved plan. Sites having an IP of moderate or low will be upgraded to prevent or minimize erosion potential with the first NTO that includes those sites.
- **WLPZ Landing:** Existing landing L1 is within the WLPZ and therefore has greater potential to cause sediment to enter a watercourse. The landing can be used without causing sediment to reach the nearby watercourse for the following reasons:
  - The landing will not be expanded beyond its existing area. Only a small area is within the WLPZ.
  - No rilling or other evidence of erosion was observed following the previous use.
  - The landing and the surrounding ground has a less than five percent slope which prevents water draining off from gaining momentum and thus scouring soil.
  - A vegetative filter strip exists between the landing and the watercourse where suspended sediment will be filtered out and water will infiltrate into the soil before reaching the watercourse. No additional vegetation removal is required to use the landing other than any forbes that have established on the existing surface

- following the previous use.
- The landing surface will be drained to a chosen stable area.
  - A waterbar prevents flow from the landing from draining down the road. The waterbar will be reestablished following operations and will be of sufficient size to accommodate flow. Waterbars will be reestablished on the road above the landing to prevent flow from the road from crossing the landing.
  - The landing surface within the WLPZ will be treated with non-reproducing grass seed and straw mulch at the rate specified in item 18 following use. Straw and established grass will intercept rain drops and surface flow, dissipating the energy and slowing the flow of runoff.
  - All skid trails serving the landing are existing and outside of the WLPZ.
  - The soil type and slope constitute a moderate erosion hazard rating.
  - The use of this existing landing prevents the need for creation of a new landing, which would have greater potential to cause adverse impacts by removing sediment stabilizing plants and creating new source of surface fines and possibly fill material that could be unstable.
- *Log hauling and general access to operating areas across unstable areas:*
    - *Slope stability for S7 was evaluated in a report by Joyce Associates, Geologic Consultants, 2001. S7 corresponds to Area E in the Joyce report which concluded that it is unlikely that Sawmill Gulch is underlain by landslide deposits. The evaluation in 2001 concluded that although the road cut probably contributed to landslide movement, the existing road could be reused. The road cut is at the toe of the slide and therefore would not add weight to the feature. The lateral stability of the slide may have been compromised by the road cut. That condition did not change during or following the previous harvest and presumably will not change with reuse of the road for this NTMP.*
    - *S6 has no evidence of movement other than slightly leaning, mature trees. There is no evidence of slope failure or mass wasting. The road surface is on gentle slopes, approximately 30% side slope. The road section that crosses S6 does not provide a log truck haul route. The only use would be general access and road and crossing maintenance.*
  - *Road and Trail Construction:* No new roads or trails are proposed in this NTMP which limits creation of bare soil, soil disturbance, and does not redirect surface flow creating new potential drainage issues.
  - *Natural Erosion Processes:* Natural erosion processes are occurring in the stream channels of watercourses in the WAA. Some watercourses show erosion effects from historic logging activity. The Stream Inventory Report for Sheephouse Creek notes logging debris in watercourses causing scouring that was not caused by recent operations in this NTMP area. There are many watercourse segments within the NTMP that have the potential to contribute sediment to higher order watercourses. The Willow Creek Planning Watershed is a listed EPA 303(d) water body for sediment and siltation and temperature.
  - *General Erosion Control Measures:*
    - The potential for timber operations to contribute sediment to the stream system will be avoided or prevented by implementing measures such as

armoring fill and dissipating water flow energy with appropriately sized rock, replacing undersized or failing culverts, generally avoiding operations on unstable areas, waterbar placement on skid trails, seasonal road drainage maintenance, and covering bare soil with straw, slash, or seed. Covering bare soil in this way is meant to intercept rain drops to prevent direct impact which would dislodge soil particles allowing them to mobilize, to slow and disperse overland flow to assist infiltration into the soil and to prevent soil movement by wind. Unchecked flow can concentrate and gain momentum causing rilling, scouring, and downcutting.

- *Rock Armor:* Rock armor size at watercourse crossings is calculated, using the simplified approach nomograph provided in *Designing Watercourse Crossings for Passage of 100-Year Flood Flows, 2017*, to stay in place during high flows, preventing soil from becoming exposed and eroded by stream flow. Appropriately sized culverts, using the Rational Method and the Magnitude and Frequency Equation, will be less likely to plug, allowing woody debris to pass through. Plugged culverts can cause water to run onto the road surface and transport sediment into watercourses.
- *Road and Trail Drainage:* Waterbars rolling dips, crossdrains, and outspacing are placed at intervals specified by the Forest Practice Rules according to slope, erosion hazard rating, and appropriate (stable) locations. These installations allow surface flow to leave the road surface before becoming concentrated such that it carries suspended sediment downslope.
- *Tree Falling:* Trees that are marked within the WLPZ shall be felled away from the channel. No skid trails within the WLPZ shall be used and no exceptions to this rule are proposed. Canopy closure will intercept, and attenuate rain drop effect on soils adjacent to the watercourse (Iverson and Major, 1987). Maintenance of large root masses from large trees will retain significant root cohesion properties in the soil (Montgomery et al. 2000). The limited removal of trees in the WLPZ along with the equipment exclusion zone shall minimize the amount of sediment generated by operations, and therefore the amount of sediment deposited into the watercourse. Additionally, by simply not using existing skid trails within the WLPZ and excluding equipment by the distances listed above, soil disturbance adjacent to the watercourse and soil deposition shall be minimized.
- *Winter Operations:* Winter operations (Item 23) are limited to stable unsaturated soils and erosion control measures such as water bars on skid trails, landings and approaches to landings, straw mulching of landings, and slash packing on skid trails must be in place prior to rainfall that could cause overland flow (Item 18), conditions when soil mobilization is greatest.
- *Maintenance Period:* The required erosion control maintenance period is three years following operations. When other activities are performed after the maintenance period has ended, erosion control shall be maintained in all areas affected by those activities. These provisions are stated in Section II, Item 8 of this NTMP.
- *Future Projects not associated with this NTMP:*
  - *Ranching and livestock grazing could remain constant on private lands and*

*leased public lands. It is unlikely that livestock grazing would increase as market conditions are not favorable for non-industrial ranchers. There would be no change to sediment effects.*

- *Conservation organizations could continue to purchase properties in the WAA. Extractive resource management could be reduced with ownership changes. Sediment effects and impacts would depend on actions of the new ownership compared to the current ownership.*
- *Public recreation could increase, particularly if more properties are opened to the public. Impacts could include visitors going off designated trails causing ground disturbance and increased sedimentation.*
- *Fire hazard reduction projects will almost certainly be conducted with heightened awareness of the fuel loading problem. Public messaging around fire fuel hazard reduction has increased in recent years along with public funding being made available to private landowners to mitigate the hazard. Impacts could include temporary bare soil which could cause increased sedimentation. Long term impacts could be less sedimentation due to reduced risk of high intensity catastrophic wildfire.*

### Impacts Evaluation

*The NTMP is designed to prevent sedimentation during and after timber harvesting and to maintain, repair, and upgrade erosion prevention measures throughout the NTMP area. Operations associated with the NTMP should result in net reduction of sedimentation from current levels in the NTMP area. Combined with other projects and activities, there should be a net reduction in sedimentation.*

#### **b. Water Temperature Effects:**

Water temperature related cumulative effects are changes in water chemistry or biological properties caused by the combination of solar warmed water where natural cover has been removed. Cumulative changes in water temperature are most likely to occur in the following situations:

- Where stream bottom materials are dark in color;
- Where water is shallow and has little underflow;
- Where removal of streamside canopy results in substantial, additional solar exposure or increased contact with warm air at two or more locations along a stream;
- Where water temperature is near a biological threshold for specific species.

Significant adverse impacts of cumulative temperature increases include:

- Increases in the metabolic rate of some aquatic species;
- Reduction of dissolved oxygen levels which can cause reduced vigor and death of sensitive aquatic organisms;
- Increased growth rates of microorganisms that deplete dissolved oxygen levels or increased disease potential for organisms;
- Stream biology shifts toward warmer water ecosystems.

Water temperature is highly correlated with near-stream canopy retention. Sheephouse Creek (Class I) is the eastern boundary of the NTMP, Sawmill Gulch (Class II) runs through the NTMP, and Jenner Gulch (Class II) is the western boundary of the NTMP.

Several Class II-S and Class III tributaries and one Class II-L tributary flow into the lower reach of Sheephouse Creek, a Class I watercourse. Several Class II and III watercourses from within the NTMP boundary flow into Jenner Gulch. The Class I and II watercourses will be protected by WLPZ and a high percentage of canopy will be retained. A large proportion of the riparian canopy in these watercourses are non-commercial species such as big leaf maple, willow, alder and other hardwoods. *Trees providing bank stability to Class III watercourses will be retained providing shade from the canopy. Minimal canopy will be removed due to timber harvesting. Class III watercourses do not flow during late summer and some only flow with significant rainfall minimizing the effect of solar heated water flowing downstream.*

*No streamside vegetation is proposed for removal except for existing crossing upgrades. Trees must be felled away from watercourses minimizing disturbance to temperature regulating vegetation.*

*A seasonal road follows Sheephouse Creek within the WLPZ for the entire length of the eastern property line. This WLPZ road that is within the NTMP is approximately 1 mile long with approximately .8 miles will not be used for operations.*

*Thinning in the WLPZs of northern California forests under Anadromous Salmonid Protection rule retention standards did not result in statistically significant canopy reduction or increased stream temperatures due to solar radiation (Miralha 2024).*

Current and residual canopy will provide sufficient cover to maintain current water temperature. The overall net effect of canopy removal from Class II and Class III watercourses is not anticipated to contribute detrimental effects to water temperature.

*Studies of Sheephouse creek show that water temperature has been maintained at optimal levels for salmonids as described in this NTMP, Past and Future Activities, Watercourse Rehabilitation. Water temperature measured in Sheephouse Creek in July 2006 was 55-58 °F. Optimal temperature for rearing juvenile Coho is approximately 54-57 °F.*

### Past Projects

- *Timber Harvesting: In the late 1800s and early 1900s, timber harvesting involved the removal of nearly all merchantable trees, the highest value species being redwood. Redwoods prefer alluvial soil and a perennial source of water. They are also shade tolerant. These attributes allow them to thrive in riparian environments. Tree removal results in incidental removal of and damage to surrounding vegetation. Streams and springs without vegetative cover are subject solar heating, raising water temperatures. There are no apparent ongoing effects of historic timber harvesting on water temperature as modern protections have allowed 80% to 100% tree canopy closure.*
- *Wildland Burning: Fires would have lowered in intensity near watercourses but would*

likely have removed some cover resulting in increased stream temperatures from solar heating. There are no ongoing effects to stream temperature from past burning in the lower watershed as that vegetation has regrown.

- *Agriculture/Grazing: Past grazing activity often converted forestlands to grassland which decreased the amount of canopy in the WAA at times, increasing stream temperatures from solar heating.*
- *Road Building: Building of logging roads through riparian areas and alongside watercourses within the WAA, reduced canopy cover and therefore increased water temperatures. This impact continues to the modern day as many of those roads are still in use and maintenance includes removing vegetation that could obstruct traffic.*

### Current and Ongoing Projects

- *Timber Harvesting: Timber Harvesting has been conducted as recently as 2024. WLPZ areas were not harvested and not entered by equipment. Vegetation near watercourses is maintaining temperature.*
- *Road maintenance: No road construction is being conducted. Road maintenance and upgrading are ongoing.*
- *Grazing: Cattle grazing on the NTMP property and neighboring properties is ongoing. It is unknown if livestock is impacting near-stream vegetation. Foresters visiting the property have not witnessed near-stream vegetation removal by livestock.*
- *Burning: Prescribed burning is being conducted within the watershed. It is assumed to be ongoing but it is not known to what extent. Wildfires have impacted the assessment area as recently as 2020.*

### Future Projects

- *Timber Harvesting: Timber harvesting is planned whether under an NTMP, THP, or exemption. Operations within the WLPZ will be limited, retaining at least 80% canopy to protect stream temperature.*
- *Road maintenance: No road construction is planned. Road maintenance and upgrading is actively being planned.*
- *Grazing: Cattle grazing is expected to continue at the current rate. No change to near-stream vegetation cover is expected.*
- *Burning: Prescribed burning may be conducted on the NTMP property although no plans have been made. Prescribed burning is expected within the WAA although no specific plans are known.*

### Impacts Evaluation

*The NTMP is designed to avoid impacts to water temperature primarily by implementing near-stream vegetation retention standards. No conversions of forest to non-forest are known within the WAA. Intermittent and ephemeral water courses only flow during cooler times of year when risk of solar heating is low. Perennial watercourses are protected with limited equipment access and high overstory canopy and understory cover retention standards preventing solar heating during warmer times of year.*

**c. Fish Passage:**

Jenner Gulch

Total Barrier 450ft downstream from plan boundary. Cascades are 685.1ft long with a 17-44% gradient. Throughout this reach, 8 inclinometer readings were taken to measure the average grade of the stream channel. Jenner Gulch was flowing continuously but no fish were observed during the survey.

Approximately 1,000ft downstream from plan boundary is a 2.3-foot-tall rock/cement dam measured from water surface/base to top of the dam wall. The dam is from the 1940s and in fair condition with a 7ft long fish ladder made of aluminum with five baffles. Not a barrier to adults but is a possible juvenile barrier. Old gauge site in downstream pool. At the time of survey, there was clear and continuous flow (CA Fish Passage December 2023 update).

Sawmill Gulch

A 48-inch diameter corrugated steel pipe has a 3-foot drop from the downstream end of the culvert to the cobble bed that joins the Russian river approximately 40 feet downstream of the culvert. This culvert is a fish passage barrier. At flood stage, the Russian River would over-top the culvert, eliminating the large drop. But at that point, the site would likely be a velocity barrier (CA Fish Passage December 2023 update).

Sheephouse Creek

A fish presence survey was conducted from the confluence with the Russian River and extended up Sheephouse Creek to a point 2,397 feet past the confluence of the Northeast tributary. That confluence is roughly the property corner and the northeast boundary of the NTMP. Flows were found to be too low and salmonid habitat was deemed unsuitable upstream of where the survey ended. A log jam discovered in the same area appeared to impede further passage. Biological inventory was conducted using one or more of three basic methods: 1) stream bank observation, 2) underwater observation, 3) electrofishing. These sampling techniques are discussed in the California Salmonid Stream Habitat Restoration Manual (CDFG. Stream Inventory Report, Sheephouse Creek. Revised April 14, 2006).

Class II(L) tributary to Sheephouse Creek aka Willig Gulch

There are two 30-inch diameter by 19.5-foot-long culverts used for access to the property. At the time of NTMP layout, the culverts were plugged and the stream flowed over the road into the mainstem of Sheephouse Creek. Crossing fill consists of rock and was not contributing sediment to the watercourse. According to the BIOS Fish Passage Assessment Database, the crossing was 10.1% passable for adult salmonids and 10.7% passable for juvenile salmonids. For adult salmonids, the culvert is not a barrier during low flows. During high flows, the culvert is a velocity barrier. For juvenile salmonids, the culvert is not a barrier during low flows. During high flows, the culvert is a velocity barrier. No salmonids were observed downstream or

upstream at time of survey (CA Fish Passage December 2023 update).

**d. Organic Debris Effects:**

Effects produced by organic debris can occur when logs, limbs, and other organic material are introduced into a waterbody or watercourse. Decomposition of this debris removes dissolved oxygen from the water and can cause impacts similar to those resulting from increased water temperatures. Introduction of excessive small organic debris can also increase water acidity (Ice, 2021).

Large organic debris is an important stabilizing agent that should be maintained in small to medium size, steep gradient channels, but the sudden introduction of large, unstable volumes of debris can obstruct and divert streamflow. Changes to large organic debris levels in watercourse channels is not proposed in this NTMP and has not been witnessed in WAA.

Removing streamside vegetation can reduce the natural, annual inputs of litter to the stream (after decomposition of logging-related litter). This can cause a drop in food supply. No streamside vegetation is proposed for removal in this NTMP and this is not a wide spread practice in the WAA.

Organic debris in varying states of decomposition is present in moderate to high levels in the watercourses in the WAA. With the WLPZ protection measures incorporated into this plan, no significant organic debris is expected to enter the watercourses as a result of timber operations.

Within the WAA, class III watercourses primarily flow during the winter period when most forestry operations are not active and accidental deposits into watercourses have been removed. The Winter Period Operating Plan (WPOP) in Item 23 contains the following provisions which will minimize the chance that disturbed/cut vegetation will wash into a watercourse. No crossings will be constructed or reconstructed during the WOP. Ground based yarding or heavy equipment use shall occur only during dry rainless periods and the dry season. Log hauling is prohibited when precipitation is sufficient to generate overland flow. Road maintenance (grading) may occur during the winter period as long as the road system is dry. A dry road is one in which moisture is less than or equal to that found during normal watering (dust abatement).

Disturbance in watercourse protection zones (WLPZs) is limited. Trees must be felled away from watercourses. Cross falling of trees across watercourses is not proposed in this NTMP.

**e. Chemical Contamination Effects:**

Chemical contamination is possible from a number of activities including but are not limited to, accidental discharge of fuel and oils from faulty equipment, operational discharge of fuel and oils from logging equipment, deposition of tree marking paint, chemical dust stabilizers, improper application of pesticides and herbicides, illegal dumping of toxics, increased uses or deposits of plant fertilizers, miscellaneous sources from rural residential development, or the introduction of nutrients released during slash burning or wildfire.

### Baseline Conditions

There are no known major sources of chemical contamination that exist within the WAA. The WAA consists of private, rural, low-density residences and low intensity agriculture. The NTMP area has not historically utilized herbicides to control competing vegetation.

Heavy equipment for logging has operated on the property at least every few years for many decades, most recently in 2024. Mendocino Redwood Company conducted logging operations on a regular basis within the watershed. No fuel spills or other contamination from these operations is known.

Roads are opened from natural tree fall and given light drainage maintenance every year using a tractor within the NTMP area and other properties throughout the watershed.

Broadcast and pile burning can release harmful chemicals and occurs from time to time within the NTMP and is likely being conducted throughout the watershed.

Local traffic and tourism results in oil, rubber tire residue, and refuse to be in position to enter watercourses. This would include Highways 1 and 116 and public lands across the Russian River from the NTMP adding to whatever entered the river upstream which is certainly many orders of magnitude higher than anything from the NTMP area.

### Past Projects

- *Timber Harvesting: Heavy equipment used within what are now WLPZs likely contributed to chemical contamination. It is not known to what extent herbicide was used within the WAA. It is probable that frilling of tanoak was conducted on the industrial timber ownerships as this is a common practice in the region. For industrial timber ownerships that used variable retention or rehabilitation silviculture, foliar herbicide application may have been conducted.*
- *Wildland Burning: Burning throughout the watershed occurred within or near watercourses and riparian areas in historic burning, which likely input chemicals into the watershed ecosystem. Equipment for these activities may have also been worked on in these areas.*
- *Agriculture/Grazing: This activity may have contributed to chemical effects from servicing heavy equipment near watercourses, the use of pesticides, and the use of fertilizers.*
- *Development and Tourism: People living within the WAA may have used pesticides including herbicides. Residents may have disposed of or stored chemicals that may have impacted watercourses. Visitors to the area may have dumped chemicals on the roadside.*
- *Road Building: Equipment used for road building, may have contributed to chemicals being released within the WAA. Projects approved under the FPRs including the most recent harvests in the WAA do not service equipment within the WLPZ. There are no known lasting effects related to equipment used for road building in the past.*

### Current and Ongoing Projects

*Timber harvesting, burning (pile and broadcast), recreation, residential living, and grazing are still the primary activities in the WAA. Burning is more controlled and covers fewer acres. Grazing is less prevalent. There is little or no new development. Tourism and recreation have increased.*

*Fewer new roads are constructed but maintenance is ongoing. No illegal marijuana cultivation is known in the WAA. Chemical usage and containment is more regulated and there is greater awareness that chemical inputs can cause adverse impacts.*

### Future Projects

*The assessment area consists primarily of large private landowners, public land, and land conservation organizations. Large private landowners in the WAA typically manage timberlands or other agriculture although some may not conduct any activities on their property and therefore do not create impacts from chemical contamination. The activities on larger ownerships are expected to continue. Future activities will be conducted with the knowledge gained from past practices and will result in fewer adverse impacts. Forestry practices may utilize herbicides for unwanted brush and tree species that inhibit the growth and success of desirable conifer tree species. This is a management tool that many landowners use to control vegetation in the most economical way and is expected to continue for small and large timberland owners in the WAA. Other agricultural management may also use herbicide and pesticides for their pastures and crops. This activity is expected to continue.*

- *Timber Harvesting: Large, forested land holdings have been and will likely continue to be harvested but could be sold and the land use changed. Residential occupancy in rural environments will continue to have impacts. The presence of people always increases the risk of chemical contamination. Activities and presence of tourists and recreationists in the WAA (tourists, recreators, and short time residents) are likely not associated with a project, especially one under state and public review, and has a much higher chance of directly contributing chemicals to the WAA without any consideration for environment or the cumulative effect.*
- *Wildland burning is expected to be conducted in the future, to a certain degree, to control fuel loads and vegetative cover and for site preparation activities. The amount of burning conducted is expected to be minimal and should not result in any adverse impacts, especially since the FPRs restrict fueling and heavy equipment in the WLPZ.*
- *Livestock grazing: and other agricultural uses are expected to continue at low levels, and chemicals associated with these activities may contribute a small and insignificant amount to contamination in the future.*
- *Berry's Knotfarm NTMP:*
  - *Equipment maintenance is a potential source of chemical contamination including the accidental release of equipment fuels and oils. Equipment shall be re-fueled and maintained outside of WLPZs, EEZs and ELZs.*
  - *Slash piles will be created at landing sites along roads. The distance of slash piles from watercourses and the establishment of WLPZ filter strips will significantly minimize the movement of excess nutrients into watercourses. Slash piles created as a result of this NTMP will follow the requirements of the FPRs including the placement of piles outside of WLPZs.*
- *Pesticide/Herbicide: Pesticides including herbicide may be used in the watershed. No pesticide or herbicide use is proposed in this NTMP.*

### Impact Evaluation

*Chemical input sources are expected to remain the same but chemical release is expected to decline due to laws and regulations and heightened awareness of adverse impacts. No new land use categories have been added to the WAA and none are anticipated. The amount of timber harvesting, including this NTMP, is expected to continue at the current rate. No pesticide/herbicide use is proposed for this NTMP. This project together with other projects and chemical usage in the WAA will not cause increased impacts and therefore no significant impact.*

**f. Peak Flow Effects:**

Cumulative effects caused by management induced peak flow increases in streams during storm events are difficult to anticipate. Peak flow increases may result from management activities that reduce vegetative water use or produce openings that change the timing of flows by producing more efficient lag time. While increases are likely to be small relative to pre-harvest peak flow, extensive canopy removal over a short period of time on a watershed scale can increase peak flow effects on streambank erosion, channel incision, and headward channel extension in erodible landscapes. The timing and concentration of flows affecting lower order watercourse channel morphology can also be affected by the routing of runoff from roads, landings, and skid trails. Peak flow effects diminish with decreasing intensity of canopy removal, increasing time since harvest, and during larger flow recurrence intervals.

The area is known to receive high localized rainfalls. Information from the Forest Practice Watershed Mapper v2 indicates a WAA average annual rainfall of 30-40 inches across the NTMP. Two-year one-hour rainfall is high at approximately .8 inches.

Past Projects

- *Timber harvesting: Peak flow would have increased substantially in the early 1900s due to clear cutting which eliminated much of the water uptake, storage, and transpiration effects of large trees.*
- *Wildland Burning: A large-scale reduction in canopy and vegetation from past burning activities would have led to excessive runoff due to a lack of interception by vegetation. Interception of runoff by vegetation would have delayed water reaching watercourses. This would have increased peak flow during and immediately following storm events.*
- *Agriculture/Grazing: Conversion of forest to grassland may have increased runoff and rate of delivery of water to watercourses which would have increased peak flow during and immediately following storm events.*
- *Development: Creation of impervious ground surfaces in the WAA during the development rural residences and roads increased peak flow due to lack of infiltration into the soil. The developed area in the WAA is relatively small and so the effect was likely also small. Impervious surfaces allow water to concentrate and quickly flow across these surfaces towards drainage structures. Detention of water in ponds or tanks can slow the rate of runoff but these facilities may become overwhelmed.*

Current and Ongoing Projects

*Timber harvesting, burning (pile and broadcast), recreation, residential living, and grazing are still the primary activities in the WAA. Prescribed burning is more controlled and covers fewer acres. Wildfires are suppressed or contained within perimeters designed to limit damage and provide public safety. Grazing is less prevalent. There is little or no new development. Fewer new roads are*

*constructed. Vegetation cover in the WAA is high compared to conditions in the 20<sup>th</sup> century due to fire suppression, lack of active management, and lack of development/conversion. Water uptake, storage, and transpiration by forests and other vegetation types would also be assumed to be at high levels.*

### Future Projects

*There is no imminent foreseeable change to land management activities in the WAA. Without large-scale vegetation removal or creation of new impervious ground surfaces, peak flow would not be increased by future projects.*

*Berry's Knotfarm NTMP: This NTMP does not propose increased removal of the overstory canopy. This NTMP does not propose the creation of group openings. The proposed selection and special treatment area silvicultures will retain significant residual overstory vegetative cover as required for stocking compliance. Forest thinning will create increased sunlight in the understory which will lead to an increase in understory vegetation. The NTMP area will remain naturally vegetated except for roads, landings, and skid trails which are existing. No new roads or trails are proposed. Soil compaction will be kept to a minimum allowing for rainfall infiltration into the soil. There is likely to be an initial decrease in water uptake by the postharvest timber stand which could increase peak flow. This effect will be moderated through time by the retention of vegetation throughout the NTMP area and particularly in the Class II WLPZs and increased tree growth from forest thinning. Peak flow will also be moderated by reaccumulation of duff and litter and implementation of erosion control measures designed to drain to stable areas, slow flow, and disperse flow allowing infiltration into soil.*

### Impacts Evaluation

*There is no known large-scale vegetation clearing project or combination of smaller projects that would result in significant vegetation cover reduction. No such projects are planned. This NTMP will not result in significant loss of vegetative cover. Timber harvesting may cause short term loss of transpiration capacity thereby increasing peak flows. Timber harvest rates are expected to remain similar to post FPR harvests on the property. This NTMP together with other projects and activities in the WAA would not constitute a significant impact.*

### **g. Watercourse Condition (Stream Morphology)**

One of the larger watercourses within the WAA is Sheephouse Creek, which flows along the eastern side of the plan area and drains into the Russian River. Jenner Gulch and Sawmill Gulch both have fish passage barriers. An inventory was conducted in 1996 on Sheephouse Creek. Another Class I watercourse flows from the plan area into Sheephouse Creek. Data from the inventory is included in the following descriptions.

#### **Sheephouse Creek (includes Willig Gulch) - Class I**

**Embeddedness:** The depth of embeddedness of the cobbles in pool tail-out reaches is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Sheephouse Creek, embeddedness was visually estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3), 76 - 100% (value 4). Additionally, a rating

of "not suitable" (NS) was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate particle size, having a bedrock tail-out, or other considerations. For Sheephouse Creek, of the 122 pool tail-outs measured, 18 had a value of 1 (15%); 81 had a value of 2 (66%); 21 had a value of 3 (17%); and 2 had a value of 4 (2%). On this scale, a value of one is best for fisheries.(CDFW Stream Survey Report 2006).

**Pools Filled:** Pools comprised 23% of the total length of this survey. In first and second order streams a primary pool is defined to have a maximum depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. In Sheephouse Creek, 50% of the pools identified have a maximum depth of at least 2 feet and are therefore primary pools. (CDFW Stream Survey Report 2006).

**Aggrading:** Moderate to High

**Bank Cutting & Bank Mass Wasting:** Moderate to High.

**Scouring & Downcutting:** Scouring and downcutting have been noted in Sheephouse Creek. (CDFW Stream Survey Report 2006).

**Organic Debris:** Moderate to High. Organic debris entering a watercourse can have both positive and negative effects. Medium to large debris can act as a stabilizing agent. However, the introduction of large amounts of unstable debris can obstruct stream flow. Large quantities of small debris introduced into small streams can lower dissolved oxygen content and increase water acidity. FPRs require the removal of organic material delivered to watercourses during felling operations. Therefore, there is not expected to be any increases in acidity or reduction in dissolved oxygen from the proposed project. (CDFW Stream Survey Report 2006).

**Streamside Vegetation:** For the stream reach surveyed, the mean percent right bank vegetated was 76%. The mean percent left bank vegetated was 73%. The dominant elements composing the structure of the stream banks consisted of 1% bedrock, 2% boulder, 9% cobble/gravel, and 88% sand/silt/clay (Graph 10). Evergreen trees were the dominant vegetation type observed in 55% of the units surveyed. Additionally, 8% of the units surveyed had brush as the dominant vegetation type, 7% grass, 1% bare soil, and 29% had deciduous trees as the dominant vegetation. (CDFW Stream Survey Report 2006).

#### **Recent Floods:**

Winter storms often bring down large trees and other woody debris into the stream which increases the number and quality of pools. This woody debris, if left undisturbed, will provide fish shelter and rearing habitat, and offset channel incision. Recent floods occurred in the winter of 2023/2024 (minor), 2017/2018 (moderate), and 2006 (major). Flood frequency may increase over time with climate change.

#### **Jenner Gulch – Class II (L)**

##### **Embeddedness – Low**

Water was clear and flow slow enough to observe the stream bed. Gravels cover most of the of the stream bed riffle and glide sections.

### **Pools Filled – Low**

Many stream channel pools are present along the NTMP boundary. Average pool size is approximately 10 feet by 10 feet. Pool depth was not measured and is difficult to determine but approximately 1-2 feet. Most pools have a bedrock bottom.

### **Aggrading – Low**

Due to bedrock visible in the channel, it appears that most sediment entering channel is flushed out.

### **Bank Cutting & Bank Mass Wasting – Moderate**

Stream bank failures are visible. Many of the scarps are bare, indicating recent failure. The failures appear to be caused by undercutting as they are adjacent to the channel and are not connected to disturbed areas.

### **Scouring & Downcutting – Low**

Much of the channel is bedrock with no opportunity to downcut.

### **Organic Debris – Moderate**

The channel contains woody debris from tree fallen trees but significantly less than Sheephouse Creek. Much more of the channel can be traversed on foot. small debris appears to flush out.

### **Streamside Vegetation – Moderate to High**

Conifers, deciduous hardwood, ferns and shrubs occupy the stream bank above the bank full mark where bank failure has not occurred recently.

### **Recent Floods – Low to Moderate**

Recent floods occurred in this region during the winter of 2023/2024 (minor), 2017/2018 and 2025 (moderate), and 2006 (major). Flood frequency may increase over time with climate change. However, overtopping is not possible along most of the channel it is deeply incised.

### **Sawmill Gulch – Class II**

#### **Embeddedness – High**

Water runs clear, but fine sediment surrounds or covers rocks, gravels and cobbles.

#### **Pools Filled – Med**

Many stream channel pools are present along the NTMP boundary. Average pool size is approximately 2 feet by 4 feet. The pool depth is approximately 1 foot. Bottom of pools are a bed of sediment.

#### **Aggrading – High**

Stream flows into an old mill pond constructed in the 1900's that is now filled with sediment. Past the pond the gradient flattens and the stream fans out into a marsh area.

### **Bank Cutting & Bank Mass Wasting – Moderate**

Stream bank failures are visible. Many of the scarps are bare, indicating recent failure. The failures appear to be caused by undercutting as they are adjacent to the channel and are not connected to disturbed areas.

### **Scouring & Downcutting – Moderate**

Downcutting & Scouring is occurring in parts of the stream bed. The majority of this is believed to have occurred in the past and is beginning to stabilize over time.

### **Organic Debris – Moderate**

The channel contains woody debris from tree fallen trees, root wads and leaf litter. Much of the channel can be traversed on foot.

### **Streamside Vegetation – Moderate to High**

Conifers, deciduous hardwood, ferns and shrubs occupy the stream bank above the bank full mark where bank failure has not occurred recently.

### **Recent Floods – Low to Moderate**

Recent floods occurred in this region during the winter of 2023/2024 (minor), 2017/2018 and 2025 (moderate), and 2006 (major). Flood frequency may increase over time with climate change.

### **Embeddedness – effects of past, present, and future projects and activities together with this NTMP**

#### Past Projects

*Past projects and activities in the WAA that could have contributed to watercourse embeddedness are the same as those discussed in Sediment Effects. They include timber harvesting, wildland burning, agriculture/grazing, development, road building and recreation. Sedimentation of watercourses led to the embedding of gravels and therefore a reduction in the quality of habitat for spawning anadromous salmonids.*

#### Current and Ongoing Projects

*Timber harvesting, burning (pile and broadcast), recreation, residential living, grazing, and recreation are still the primary activities in the WAA. Prescribed burning is more controlled and covers fewer acres. Wildfires are suppressed or contained within perimeters designed to limit damage and provide public safety. Grazing is less prevalent. There is little or no new development. Fewer new roads are constructed. Recreation has increased.*

*Efforts are ongoing to correct erosion issues, upgrade drainage facilities, protect fills, and restore stream habitat. When erosion is reduced, sedimentation is reduced. Sedimentation causes embeddedness.*

#### Future Projects

*The ongoing efforts to prevent erosion and sedimentation are expected to continue. These efforts are often in the form of projects. Primary activities in the WAA are not expected to change significantly.*

*Berry's Knotfarm NTMP: This NTMP is designed to harvest timber without causing sedimentation, to upgrade drainage facilities, and to apply measures to reduce discharge from other sources such as fills and landslides. The net effect would be reduced sedimentation to watercourses so that it does not embed potential spawning gravel.*

- *Silviculture – Single-Tree Selection and Special Treatment Area silvicultural methods will provide slope stability rain interception and runoff dispersal. Silvicultural limitations in the WLPZ provide a sediment filter strip.*
- *Road Improvements – Watercourse crossing upgrades and drainage facility maintenance decreases sedimentation.*
- *Soil Stabilization Measures – Bare and disturbed soils will be treated prior to weather conditions that could cause sedimentation. Treatments and conditions are described in Section II, Item 18.*
- *Yarding Methods – Use of existing skid trails will avoid creating new trails. Cable yarding in some areas will prevent the need for trails and long lining.*
- *Winter Period Operating Plan – The WPOP prevents the use of heavy equipment and log trucking on saturated soils which prevents sediment mobilization and damage to drainage facilities.*

#### Impacts Evaluation

*Embeddedness may continue to occur due to sediment from failing legacy roads or fill from past projects. There may be areas within the WAA with erosion problems that are not or cannot be addressed and are ongoing sediment sources. Drainage facility upgrades and erosion control and prevention measures are being implemented throughout the WAA. Future projects are not expected to have an adverse impact to gravel embeddedness as erosion control and prevention will be required. The proposed NTMP is not expected to have adverse impacts to gravel embeddedness for the reasons discussed under Future Projects. The NTMP together with other projects and activities in the WAA should lessen embeddedness in watercourses.*

#### **Pools Filled - effects of past, present, and future projects and activities together with this NTMP**

*Salmonids require habitat types including pools, riffles, and glides, to accommodate different life stages. Pool habitats are required by most salmonids at one or more life stages. Provided that water quality is adequate, primary pools provide critical summer habitat for steelhead and coho salmon.*

#### Past Projects

*Past projects and activities in the WAA that could have contributed to pools in watercourses being filled with sediment are the same as those discussed in Sediment Effects. They include timber harvesting, wildland burning, agriculture/grazing, development, road building and recreation. Sedimentation of watercourses led to pools being filled and therefore a reduction in the quality of habitat for anadromous salmonids.*

#### Current and Ongoing Projects

*Timber harvesting, burning (pile and broadcast), recreation, residential living, grazing, and*

*recreation are still the primary activities in the WAA. Prescribed burning is more controlled and covers fewer acres. Wildfires are suppressed or contained within perimeters designed to limit damage and provide public safety. Grazing is less prevalent. There is little or no new development. Fewer new roads are constructed. Recreation has increased.*

*Efforts are ongoing to correct erosion issues, upgrade drainage facilities, protect fills, and restore stream habitat. When erosion is reduced, sedimentation is reduced. Sediment can fill pools.*

### Future Projects

*The ongoing efforts to prevent erosion and sedimentation are expected to continue. These efforts are often in the form of projects. Primary activities in the WAA are not expected to change significantly.*

*Berry's Knotfarm NTMP: This NTMP is designed to harvest timber without causing sedimentation, to upgrade drainage facilities, and to apply measures to reduce discharge from other sources such as fills and landslides. The net effect would be reduced sedimentation to watercourses so that it does not fill in-stream pools.*

- *Silviculture – Single-Tree Selection and Special Treatment Area silvicultural methods will provide slope stability rain interception and runoff dispersal. Silvicultural limitations in the WLPZ provide a sediment filter strip.*
- *Road Improvements – Watercourse crossing upgrades and drainage facility maintenance decreases sedimentation.*
- *Soil Stabilization Measures – Bare and disturbed soils will be treated prior to weather conditions that could cause sedimentation. Treatments and conditions are described in Section II, Item 18.*
- *Yarding Methods – Use of existing skid trails will avoid creating new trails. Cable yarding in some areas will prevent the need for trails and long lining.*
- *Winter Period Operating Plan – The WPOP prevents the use of heavy equipment and log trucking on saturated soils which prevents sediment mobilization and damage to drainage facilities.*

### Impacts Evaluation

*Sediment may continue to fill in-stream pools due to failing legacy roads or fill from past projects. There may be areas within the WAA with erosion problems that are not or cannot be addressed and are ongoing sediment sources. Drainage facility upgrades and erosion control and prevention measures are being implemented throughout the WAA. Future projects are not expected to have an adverse impact to pool filling as erosion control and prevention will be required. This NTMP is not expected cause pool filling for the reasons discussed under Future Projects. The NTMP together with other projects and activities in the WAA should lessen pool filling in watercourses.*

### ***Aggrading - effects of past, present, and future projects and activities together with this NTMP***

*Aggradation of stream beds is similar to embedding gravels and filling pools in that they are all caused by sediment entering the watercourse and they often accompany each other. The generally low gradient of the lower reaches of the perennial watercourses in and adjacent to the NTMP makes aggradation more likely. Water flows more slowly at lower gradient allowing suspended sediment to settle out. An aggraded stream bed is at higher elevation than it was prior*

*to the excessive sediment load introduction and can result in flooding.*

### Past Projects

*Past projects and activities in the WAA that could have contributed to aggraded stream beds are the same as those discussed in Sediment Effects. They include timber harvesting, wildland burning, agriculture/grazing, development, road building and recreation. Sedimentation of watercourses led to aggradation of stream beds and likely embedded gravels and filled pools. Aggradation resulting from activities in the early and mid-20th century has likely since degraded. However, perched fill in legacy roads and other features is still present and may fail where it is not possible to address it. The aggradation effects of projects in the last 30 years may still be present.*

### Current and Ongoing Projects

*Timber harvesting, burning (pile and broadcast), recreation, residential living, grazing, and recreation are still the primary activities in the WAA. Prescribed burning is more controlled and covers fewer acres. Wildfires are suppressed or contained within perimeters designed to limit damage and provide public safety. Grazing is less prevalent. There is little or no new development. Fewer new roads are constructed. Recreation has increased.*

*Efforts are ongoing to correct erosion issues, upgrade drainage facilities, and protect fills which should lessen the likelihood of aggradation. When erosion is reduced, sedimentation is reduced. Sediment causes stream bed aggradation. As anthropogenic sediment sources are reduced and stabilized, watercourses should self-correct this condition and flush the excess sediment through the system.*

### Future Projects

*The ongoing efforts to prevent erosion and sedimentation are expected to continue. These efforts are often in the form of projects. Primary activities in the WAA are not expected to change significantly.*

### *Berry's Knotfarm NTMP:*

*This NTMP is designed to harvest timber without causing sedimentation, to upgrade drainage facilities, and to apply measures to reduce discharge from other sources such as fills and landslides. The net effect would be reduced sedimentation to watercourses so that it does not cause stream bed aggradation.*

- *Silviculture – Single-Tree Selection and Special Treatment Area silvicultural methods will provide slope stability rain interception and runoff dispersal. Silvicultural limitations in the WLPZ provide a sediment filter strip.*
- *Road Improvements – Watercourse crossing upgrades and drainage facility maintenance decreases sedimentation.*
- *Soil Stabilization Measures – Bare and disturbed soils will be treated prior to weather conditions that could cause sedimentation. Treatments and conditions are described in Section II, Item 18.*
- *Yarding Methods – Use of existing skid trails will avoid creating new trails. Cable yarding in some areas will prevent the need for trails and long lining.*

- *Winter Period Operating Plan – The WPOP prevents the use of heavy equipment and log trucking on saturated soils which prevents sediment mobilization and damage to drainage facilities.*

### Impacts Evaluation

*The volume of sediment required to cause aggradation would be supplied by mass wasting. Some mass wasting in the WAA is geological. Mass wasting caused by timber operations or neglect of erosion control facilities is unlikely. The NTMP property is large enough to conduct multiple projects within a ten-year time frame which is the minimum reentry period. The high frequency of site visits by foresters, technicians, the landowner, contractors, and agencies to facilitate projects will ensure that erosion control is monitored.*

*Future projects are not expected to cause aggradation as they will be designed to minimize erosion in 100-year rainfall events. This NTMP is not expected to cause stream bed aggradation for the reasons discussed under Future Projects. The NTMP together with other projects and activities in the WAA should not cause aggradation in watercourses.*

### **Bank Cutting & Bank Mass Wasting - effects of past, present, and future projects and activities together with this NTMP**

*Bank cutting is indicated by areas of fresh, unvegetated soil or alluvium exposed along the Watercourse Banks, usually above the low-flow channel and often with a vertical or undercut face. Severe bank cutting is often associated with channels that are downcutting, which can lead to over-steepened banks, or aggrading, which can cause the channel to migrate against slopes that were previously above the high flow level of the Watercourse.*

### Past Projects

*Past projects and activities in the WAA that could have contributed to bank cutting and mass wasting are the same as those discussed in Sediment Effects. They include timber harvesting, agriculture/grazing, development, and road building. Wildland burning and recreation were probably not primary contributors.*

- *Timber harvesting: Non-merchantable logs including non-commercial tree species and cull logs often rolled into the watercourses. The logs would deflect streamflow into the banks causing scouring and leaving the banks in an over-steepened condition at which point they would cleave off into the watercourse. Historic era clearcutting would have increased stream flow as described in Peak Flow Effects. This could lead to undercutting, a common cause of bank cutting and mass wasting. Filled in channels for skidding or erosion would raise the high-water line, causing the flow to migrate against the newly vulnerable banks. The watercourse would then downcut through the fill creating new steep banks vulnerable to bank cutting and mass wasting.*
- *Agriculture/Grazing: Removal of bank stabilizing vegetation would have left banks vulnerable to the force of streamflow which could undercut them causing bank cutting and mass wasting. Burning may have had a similar effect but fires are often less intense in riparian zones and the stabilizing vegetation would be reestablished post-fire.*
- *Development: Streams were rerouted to establish developments. Developments often utilized the flat ground of a flood plain. Streams were channelized where there had been a flood*

*plain naturally dispersing overtopping flows. Stream flow redirected or unnaturally channelized could result in new channel establishment leading to downcutting, undercutting, and scouring which could result in bank cutting and mass wasting.*

- *Road Building: Roads were built with fill material as the embankment which often served additionally as the stream bank. The loose material was easily undercut causing bank cutting and mass wasting. Culverts and other stream crossings were often misaligned causing scouring which led to bank cutting and mass wasting.*

#### *Current and Ongoing Projects*

*Projects are more carefully designed to avoid the erosion problems of the past. Stream bank stabilizing vegetation is protected. Stream channels are no longer used as skid trails, except for perpendicular crossings. Building in flood plains is discouraged. Incising stream channels is discouraged. Flood plains and purposely reestablished where feasible. Livestock is fenced out of stream channels. Road embankments that double as the stream bank are only in use where they can be stabilized and proper drainage can be maintained. In some cases the banks are armored with rock, logs, or other engineered structures. Culverted crossings are sized for 100-year flow and aligned with the natural channel.*

#### *Future Projects*

*Efforts are ongoing to prevent stream bank cutting and mass wasting although some of these events are natural and can be beneficial. These efforts are often in the form of projects. Primary activities in the WAA are not expected to change significantly.*

#### *Berry's Knotfarm NTMP:*

*This NTMP is designed to harvest timber without altering stream channel morphology. Watercourse crossings will be properly aligned, armored where necessary, and sized for 100-year rainfall events. The net effect would be reduced stream channel modification due to human activities.*

- *Silviculture – Selection silviculture minimizes the effect on peak flow. Very little tree removal is allowed within the WLPZ.*
- *Road Improvements – Watercourse crossing upgrades are required.*

#### *Impacts Evaluation*

*Some stream bank cutting and mass wasting in the WAA is geological. Some landslides are geological processes and will continue to occur. Landslides may have been exacerbated by past projects but current and ongoing projects avoid impacts to landslides and future projects will as well. This project and others in the WAA are incorporating hydrologic considerations and designs into the plans.*

*Future projects are not expected to cause stream bank cutting and mass wasting This NTMP is not expected to cause changes to stream bank morphology except at road crossings which are carefully designed. No new crossings are proposed. The NTMP together with other projects and activities in the WAA should not cause bank cutting and mass wasting.*

### ***Scouring and Downcutting - effects of past, present, and future projects and activities together with this NTMP***

*Scouring is described in the Forest Practice Rules as “Stream channels that have been stripped of gravel and finer bed materials by large flow events or debris torrents. Streamside vegetation has often been swept away, and the channel has a raw, eroded appearance.”*

#### *Past Projects*

*Past projects and activities in the WAA that could have contributed to scouring and downcutting are the same as those discussed in Sediment Effects. They include timber harvesting, agriculture/grazing, development, and road building. Wildland burning and recreation were probably not primary contributors.*

- *Timber harvesting: Non-merchantable logs including non-commercial tree species and cull logs often rolled into the watercourses. The logs would deflect streamflow into the banks causing scouring. Logging debris also caused scouring of the stream bed.*
- *Historic era clearcutting would have increased stream flow as described in Peak Flow Effects. The increased flow could have contributed to scouring and downcutting through sediment deposits caused, in part by harvesting practices.*
- *Agriculture/Grazing: Removal of bank stabilizing vegetation would have left banks vulnerable to the force of streamflow which could scour them. Burning may have had a similar effect but fires are often less intense in riparian zones and the stabilizing vegetation would be reestablished post-fire.*
- *Development: Impervious surfaces created by soil compaction could have increased the rate of runoff and contributed to increased peak flow contributing to scouring. Where stream flow was redirected to a new location, downcutting could occur. Where streams were channelized and incised, increased flow velocity could cause downcutting and scouring. Woody debris removal from stream channels was common to prevent flooding but this practice would increase flow velocity, increasing scouring and downcutting through built up sediment.*
- *Road Building: Road drainage likely concentrated flow which could have increase stream flow particularly where flow is moved by a road surface or ditch from one drainage to a different drainage. This effect is most likely in Class III watercourses because there are more of them closer together.*

#### *Current and Ongoing Projects*

*Timber harvesting, grazing, residential living, and recreation are the primary activities in the WAA. Prescribed burning is more controlled and covers fewer acres. Wildfires are suppressed or contained within perimeters designed to limit damage and provide public safety. Grazing is less prevalent. There is little or no new development. Fewer new roads are constructed. For these reasons, vegetation cover is very high within the WAA. Scouring and downcutting is currently occurring in the NTMP area and likely in other areas of the WAA. This would be partly caused by past logging which was prevalent throughout the WAA. Debris entered watercourses causing*

*scouring through sediment which was also caused by past logging. This is an ongoing phenomenon. It is not permitted to add any debris to watercourses except for restoration projects designed by professionals and approved by agencies.*

### Future Projects

*Projects and activities are expected to be the same as current ones except that additional properties could be acquired by conservation organizations. Projects on conserved land are expected to be relatively benign as it pertains to scouring and downcutting.*

*Berry's Knotfarm NTMP:*

- *Silviculture – Single tree selection and Special Treatment Area retention will allow some water to transpire, reducing flow. Tree and understory vegetation will slow runoff. Retention is very high in WLPZs enhancing these effects.*
- *No new roads or trails will be constructed. New roads and trails would cause additional changes to drainage patterns.*
- *Trees are to be felled away from watercourses and any debris that enters a watercourse from harvest operations must be removed.*

### Impacts Evaluation

*High stream flow and velocity are causes of scouring and downcutting. Peak Flow Effects addresses flow rates. Current and ongoing projects in the WAA are not expected to increase flow rates due to high levels of vegetation transpiration. Vegetation cover in the WAA is high due to fire suppression, lack of active management, and lack of development/conversion. Vegetation also meters flow, slowing velocity. This NTMP will retain at least as much vegetative cover, if not more, as previous projects on the property. Flow deflection also causes scouring. Removing woody debris from watercourses is not permitted without agency approval for critical situations. This NTMP together with other projects in the WAA is not expected to have significant effects on scouring and downcutting.*

### **Organic Debris - effects of past, present, and future projects and activities together with this NTMP**

*Organic debris can be beneficial. Debris can be fish habitat providing shelter from predators and it can create fish habitat by forming pools. Debris can slow sedimentation. Too much debris in the wrong place can block or deflect flow or be a barrier to fish passage. Excessive organic debris removes dissolved oxygen from the water and can cause impacts similar to those resulting from increased water temperatures. Introduction of excessive small organic debris can also increase water acidity.*

### Past Projects

- *Timber Harvesting: Logging operations did not take into account the potential effects of organic debris in watercourses. Debris incidentally fell into watercourses during tree falling, limbing, and yarding. Trees would be felled across watercourses when convenient. Mass wasting triggered by operations would have transported organic debris with it. Following logging operations, there were a lack of trees to naturally recruited into watercourses.*

- *Development and Agriculture/Grazing: Land was cleared for building and farming causing a net reduction of organic material available to enter watercourses, including leaf litter. Organic debris was removed from water courses to prevent flooding.*
- *Road building produced side cast which contained both soil and organic debris. Much of that material would fall into watercourses partly due to roads being located near them.*

#### Current and Ongoing Projects

- *Timber harvesting requires retention of recruitment trees that will naturally fall into watercourses creating aquatic habitat. Debris that enters watercourses caused by operations is required to be removed. Trees that are removed are not available to enter watercourses.*
- *Stream restoration projects are common in coastal watersheds. These projects place woody debris strategically in watercourse channels to create habitat. Such projects may be occurring in the WAA.*
- *Little to no development is occurring in the WAA.*

#### Future Projects

- *Timber harvesting is expected to continue with very little effect on organic debris in watercourses.*
- *Stream restoration projects are expected to continue including placement of debris in watercourses to create habitat.*
- *Little to no development is expected in the WAA particularly in riparian zones.*
- *Removal of debris to prevent flooding is only allowed in critical situations. That practice is otherwise prohibited.*
- *Berry's Knotfarm NTMP: Retention of recruitment trees in WLPZs is required. Debris deposited in watercourses as a result of operations is required to be removed.*

#### Impacts Evaluation

*Organic debris is neither added nor removed without permission from agencies. This NTMP and other timber harvest plans will not have any substantial effect on organic debris in watercourses. Stream restoration projects are expected. This NTMP together with other projects in the WAA will not have a significant impact on organic debris in watercourses.*

#### ***Streamside Vegetation - effects of past, present, and future projects and activities together with this NTMP***

*Streamside Vegetation provides cover from predators, shade to moderate water temperature, stream bank stability, and it helps filter sediment. Leaf litter in watercourses is consumed by microbes which are then consumed by other organisms supporting a food web.*

#### Past Projects

- *Timber harvesting: Streamside vegetation was not protected during early 20<sup>th</sup> century logging. Much of it would have been denuded by the operation.*
- *Agriculture/Grazing: Livestock would have grazed all of the palatable streamside vegetation causing stream bank instability. Burning may have a similar effect although fire tends to be less intense in riparian zones.*

- *Development: Building and grading were common near water features due to access to necessary water, favorable microclimates, and flat ground in flood plains.*
- *Road Building: Roads that crossed watercourses perpendicularly to quickly get to more even topography would have a moderate or minor effect on the overall presence of streamside vegetation. Roads that paralleled watercourses would have a greater effect but primarily only on the road surface itself. Vegetation would reestablish on road edges following installation.*
- *Recreation: Popular streamside locations could become denuded and compacted over time, prohibiting regrowth of vegetation. Those areas of the Willow Creek WAA would be limited by accessibility.*

### Current and Ongoing Projects

*Disturbance to stream banks for any reason is limited by California Department of Fish and Wildlife regulations and Regional Water Quality Control Board basin plans. This applies to timber harvesting, agriculture/grazing, road building, and recreation. Stream restoration efforts are ongoing.*

### Future Projects

- *Types of projects and activities are expected to be similar to the current ones. Projects will likely have the same or greater restrictions near watercourses.*
- *Little or no development in the WAA is anticipated.*
- *Berry's Knotfarm NTMP: Restrictions to operations in the WLPZ, ELZ, and EEZ will ensure most of the streamside vegetation is undisturbed. This includes limited tree removal and no new crossings will be constructed.*

### Impacts Evaluation

*Disturbance to streamside vegetation is limited by laws and regulations for all projects. Watercourse protection is expected to increase. This NTMP together with other projects in the WAA will not have a significant impact to streamside vegetation.*

### **Recent Floods - effects of past, current, and future projects and activities together with this NTMP**

#### Past Projects

*Recent floods occurred in the winter of 2023/2024 (minor), 2017/2018 (moderate), and 2006 (major). Flood frequency may increase over time with climate change. Sonoma County has periodically opened the sand bar that closes the river mouth to manage flooding and protect species in the estuary.*

#### Current and Ongoing Status

*The WAA is bisected by the Russian River which floods it's banks regularly. Highway 116 can become inundated through the WAA. This segment of the river becomes an estuary and is influenced by tides when the mouth is open. The water level can rise and fall, influencing the lower reach of Sheephouse Creek. When the mouth is closed, large waves overtopping the berm can raise the estuary level. A saline water layer is sometimes present at the mouth of Sheephouse Creek. The*

*high river level can back up water at Sheephouse Creek, allowing sediment to settle out in the channel forming a gravel bar which causes flooding, The flooding would occur in the grassy meadow adjacent to the southern boundary of the NTMP property. The NTMP has no flood plain. The upper Willow Creek watershed on the south side of the river is also above any flood plain of the river.*

### Future Projects

*Sonoma County will continue to open the river mouth as appropriate to manage flooding and protect species in the estuary.*

*This NTMP will maintain the access road to the project area which travels through the flood prone area via deeded easement.*

### Impacts Evaluation

*The NTMP allows single tree selection and special treatment area silviculture which retain sufficient trees and other vegetation to not exacerbate flooding by reducing transpiration and increasing runoff rates. This NTMP together with the other projects in the WAA will not have a significant impact on flooding.*

## **B. SOIL PRODUCTIVITY**

“Cumulative soil productivity impacts occur when the effects of two or more activities combine to produce a significant decrease in soil biomass production potential. These impacts most often occur on-site within the project boundary, and the relative severity of productivity losses generally increase as site quality declines. The soil productivity assessment area is the NTMP area. The primary factors influencing soil productivity are listed below.” (Forest Practice Rules 2025, Technical Rule Addendum #2)

### **1. Organic Matter Loss:**

“Displacement or loss of organic matter can result in a long-term loss of soil productivity. Soil surface litter and downed woody debris are the storehouse of long-term soil fertility, provide for soil moisture conservation, and support soil microorganisms that are critical in the nutrient cycling and uptake process. Much of the chemical and microbial activity of the forest nutrient cycle is concentrated in the narrow zone at the soil and litter interface.

Displacement of surface organic matter occurs as a result of skidding, mechanical site preparation, and other land disturbing timber operations. Actual loss of organic matter occurs as a result of burning or erosion. The effects of organic matter loss on soil productivity may be expressed in terms of the percentage displacement or loss as a result of all Project activities.” (Forest Practice Rules 2025, Technical Rule Addendum #2)

### Past Activities

*Previous activities which would have contributed to organic matter loss would have come predominantly from the early road building activities, grazing and timber harvesting.*

- *Timber Harvesting: Historical timber harvesting would have contributed to displacement of surface soil. Whether erosion occurred due to skid trails and landings is unknown. Evenaged silviculture or high grading likely occurred in the early 20<sup>th</sup> century and if erosion control measures were not implemented, erosion would have occurred which would have washed organic matter away along with soil.*
- *Wildland Burning: Past burning activities could have reduced the amount of vegetation and slash after harvest on a large scale, reducing the amount of organic matter available for soil production.*
- *Road Construction: Historical road and landing construction within the NTMP boundary would have displaced organic matter resulting in less area with organic matter surface cover. Erosion may have occurred due to sidecast and poor road placement.*
- *Agriculture/Grazing: Past grazing and agriculture effects are not evident within the NTMP area. Ranching and grazing occurred in the grassland portions of the NTMP which may have reduced organic matter through overgrazing.*

#### Current and Ongoing Projects

- *Logging took place recently within the NTMP area. The existing road and landing network was utilized. Slash was piled and burned or applied to trails. There was no significant loss of organic matter.*
- *Grazing is ongoing in the pasture areas of the property. No apparent overgrazing is occurring.*
- *No roads have been recently constructed.*
- *No broadcast burning has occurred recently. A small timber stand on the property was damaged by wildfire in 2020. Organic matter was consumed by the fire.*

#### Future Projects

##### *Berry's Knotfarm NTMP:*

- *Timber Harvesting: Timber harvesting operations will result in displacement of surface organic matter due to tractor yarding, though there will be an influx of small organic matter left on the site in the form of logging slash. Timber harvesting operations may result in some organic matter loss due to possible burning of logging residue at landings. However, landings are already considered an area of lost growing space. A meta-analysis of the effects of forest harvesting and biomass removal (James et al. 2021) found that there was no significant difference in combined soil carbon between Bole Only Harvest and no-harvest controls.*
- *Silviculture: NTMP Item #14 describes the silvicultural methods proposed in this NTMP as Single Tree Selection and STA. These uneven aged silvicultures will retain and maintain a high degree of overstory and understory cover throughout the Plan area and along WLPZ corridors. High levels of postharvest vegetative cover will be retained throughout the plan area. Slash will be placed on bare soils that are not part of the road network. These provisions will help maintain and regulate the deposition of organic matter.*
- *Yarding Methods: Only existing skid trails will be used. Slash will be applied to disturbed bare soils. Waterbars will be installed and drain to stable areas with an adequate filtration*

*buffer. These treatments are part of this NTMP and are designed to minimize loss of organic material (see Section II Item 18 for the complete list of erosion control practices to be implemented under this NTMP). Roads are not considered to be areas of growing space.*

*Road Construction: No roads will be constructed under this NTMP.*

*Grazing: Livestock grazing is expected to continue as long as the ownership remains the same. If the ownership changes, livestock grazing could continue or be discontinued. Grazing for fuel reduction may be conducted.*

### Impacts Evaluation

*Annual organic matter deposition will decrease following harvesting. Residual and new sprouting vegetation will continue to provide litter fall and the necessary nutrients for maintaining soil fertility and will increase over time.*

*This NTMP will allow for future harvests and other forest management activities. These activities will follow the compliance measures in the FPR's and with those protection measures should not have significant adverse effects of organic matter loss. Existing infrastructure will be sufficient for future harvests. Silvicultural practices proposed fall within the framework of the Bole-only harvests that were found to not be significantly different from no-harvest controls (James et al. 2021).*

*Past projects and activities within the Soil Productivity Assessment Area are not having ongoing effects. There has been a natural input of organic matter following recent harvests. The proposed NTMP activities will cause significant organic matter loss. An evaluation of interactions of this NTMP together with the impacts of Past Projects and Reasonably Foreseeable Probable Future Projects will not have significant cumulative impacts to organic matter.*

## **2. Surface Soil Loss:**

*“The soil is the storehouse of current and future site fertility, and the majority of nutrients are held in the upper few inches of the soil profile. Topsoil displacement or loss can have an immediate effect on site productivity, although effects may not be obvious because of reduced brush competition and lack of side-by-side comparisons or until the new stand begins to fully occupy the available growing space.*

*Surface soil is primarily lost by erosion or by displacement into windrows, piles, or fills. Mass wasting is a special case of erosion with obvious extreme effects on site productivity. The impacts of surface soil loss may be evaluated by estimating the proportion of the project area affected and the depth of loss or displacement.” (Forest Practice Rules 2025, Technical Rule Addendum #2)*

### Past Projects

*Previous activities which would have contributed to surface soil loss would have come predominantly from the early road building activities and timber harvesting.*

- *Historical road construction within the NTMP boundary would have resulted in sidecast*

*which subsequently eroded removing surface soil. Poorly placed fill material likely eroded.*

- *Historical timber harvesting practices may have contributed to a loss of surface soil by exposing bare soil and changing drainage patterns.*

#### Current and Ongoing Projects

- *Recent timber harvesting has been conducted and inspected by Cal Fire. No violations or problems were reported.*
- *Road maintenance and upgrading is being conducted by the landowner and previous forester. Many culverts have recently been replaced, sized for 100-year rainfall events, properly aligned, and armored. Inside ditches have been enhanced and waterbars or dips established or enhanced.*
- *Livestock grazing continues on the property with no apparent overgrazing.*

#### Future Projects

- *Berry's Knotfarm NTMP: Timber harvesting operations will result in surface soil displacement and/or loss on roads, landings, and skid trails. Displacement of surface soil will be minimized by the re-use of existing skid trails. Loss of soil will be minimized on the surface of logging roads by maintaining proper drainage, watering, rocking, or other methods as necessary to prevent excessive loss of road surface material. Loss of soil will be minimized on skid trails and landings with the proper installation of erosion control facilities such as water bars and the use of slash to cover exposed soils prior to the winter period.*
- *Road Construction: No roads will be constructed under this NTMP.*
- *Grazing: Livestock grazing is expected to continue as long as the ownership remains the same. If the ownership changes, livestock grazing could continue or be discontinued. Grazing for fuel reduction may be conducted.*

#### Impacts Evaluation

*There may have been surface soil loss due to timber harvest practices in the past. Those effects have become less than significant over time. There has been a natural input of organic matter and topsoil has been kept in place with the implementation of erosion control measures. NTMP activities will not have a significant impact on surface soil loss due to future implementation of erosion control measures. NTMP activities together with the impacts of Past Projects and Reasonably Foreseeable Probable Future Projects on surface soil loss will not result in significant cumulative impacts.*

### **3. Soil Compaction:**

“Compaction affects site productivity through loss of large soil pores that transmit air and water in the soil and by restricting root penetration.” The risk of compaction from machine weight is associated with: depth of surface litter, soil structure, soil organic matter content, presence and amount of coarse fragments in the soil, soil texture, and soil moisture status. “Compaction effects may be evaluated by considering the soil conditions, as listed above, at the time of harvesting activities and the proportion of the project area subjected to compacting forces.” (*Forest Practice*

*Rules 2025, Technical Rule Addendum #2)*

*Past Activities*

*Previous activities which would have contributed to soil compaction would have come predominantly from the early road building activities, timber harvesting, and grazing.*

- *Road Construction: Historical road construction within the NTMP boundary has resulted in soil compaction in those road prisms. Compaction would have been intentional to create a stable running surface.*
- *Timber Harvesting: Historical timber harvesting practices may have contributed to soil compaction through placement of equipment such as steam powered yarders, falling trees, animal hooves, and dragging logs across the surface of the ground. Those activities would have been minimal compared to tractors. Heavy equipment, such as bulldozers, use in logging operations became wide-spread following World War II, when surplus equipment was sold to civilians.*
- *Grazing may have compacted soil by the weight of the animals being transferred to the rigid hooves along with the walking pattern. This impact would be low relative to heavy equipment use.*

*Current and Ongoing Projects*

- *Recent timber harvesting has been conducted utilizing existing infrastructure.*
- *Conifers and other vegetation continues to grow in a dense arrangement indicating productive soil. Redwood site index is not high but this is expected at this close proximity to the ocean.*
- *Livestock grazing continues on the property with no apparent degradation of productivity of the pasture.*

*Future Projects*

*Berry's Knotfarm NTMP:*

- *No road construction will be conducted under this NTMP.*
- *Limiting skidding to the use of existing trails will minimize the amount of area under equipment pressure. Operations will result in some further compaction of existing trails. Trails will still be able to provide growing space and will contain waterbars and dips for drainage. The use of cable yarding in some areas will minimize soil compaction.*
- *Winter Operations are proposed between November 15 and January 31. The winter operations plan (Section II, Item 23, Item FF) prohibits yarding, loading, and hauling during periods when soils are saturated, avoiding the risk of compaction from operations on wet soils. New compaction of soil is expected to be minimal. Greater soil compaction occurs as soil moisture approaches field capacity. This is because water acts as a lubricant between soil particles allowing them to settle closer together (Hanna, 2009). Soil wetness decreases its bearing capacity and when the stress (i.e. weight of a machine) is greater than the bearing capacity, compaction is high (Alakukku 2003).*
- *The normal loosening effects of alternate wetting/drying during subsequent seasons and of plant root growth will act to neutralize potential compaction effects.*

*Grazing: Livestock grazing is expected to continue as long as the ownership remains the same. If the ownership changes, livestock grazing could continue or be discontinued. Grazing for fuel reduction may be conducted.*

#### Impacts Evaluation

*Timber harvesting under this NTMP will only utilize existing roads, landings, and skid trails minimizing soil compaction. Skid trails will revegetate naturally between uses and the root systems will loosen soil particles. Roads and landings remain unvegetated and compacted providing necessary access for fire suppression, monitoring, and recreation. This NTMP will not increase use of the property from the current status. This NTMP together with other projects on the property will not have a significant impact.*

#### **4. Growing Space Loss:**

Forest growing space is lost to roads, landings, permanent skid trails, and other permanent or non-restored areas subjected to severe disturbance and compaction. The effects of growing space loss may be minimized by carefully planning the overall pattern of roads, etc., relative to feasible silvicultural systems and yarding methods.

#### Past Projects

*Historical road and landing construction within the NTMP boundary has resulted in growing space loss in these areas. Grazing did not result in any growing space loss.*

#### Current and Ongoing Projects

*Timber harvesting and grazing are the only project activities in the assessment area.*

#### Future Projects

*Grazing is expected to continue and has not resulted in growing space loss.*

*Berry's Knotfarm NTMP:*

- *Road Construction: Loss of growing space will be minimized by the re-use of existing roads, skid trails, and landings.*
- *Timber Harvesting: The forest will be managed using single tree selection and special treatment area silviculture leaving all harvest areas vegetated and able to reproduce. Some existing skid trails will be reused but some will not. Areas suited for skyline cable harvesting will not additionally have tractor operations in them. Unused trails in those areas are regrowing vegetation and will continue to reclaim growing space.*

#### Impacts Evaluation

*The NTMP will maintain growing space by adhering to stocking requirements which, with selection and STA silviculture, must be met immediately upon completion of timber operations. Only existing infrastructure will be used. The other uses will not alter the amount of growing space. This NTMP together with other project activities in the assessment area, will not have a significant cumulative adverse impact to growing space.*

**C. BIOLOGICAL RESOURCES**

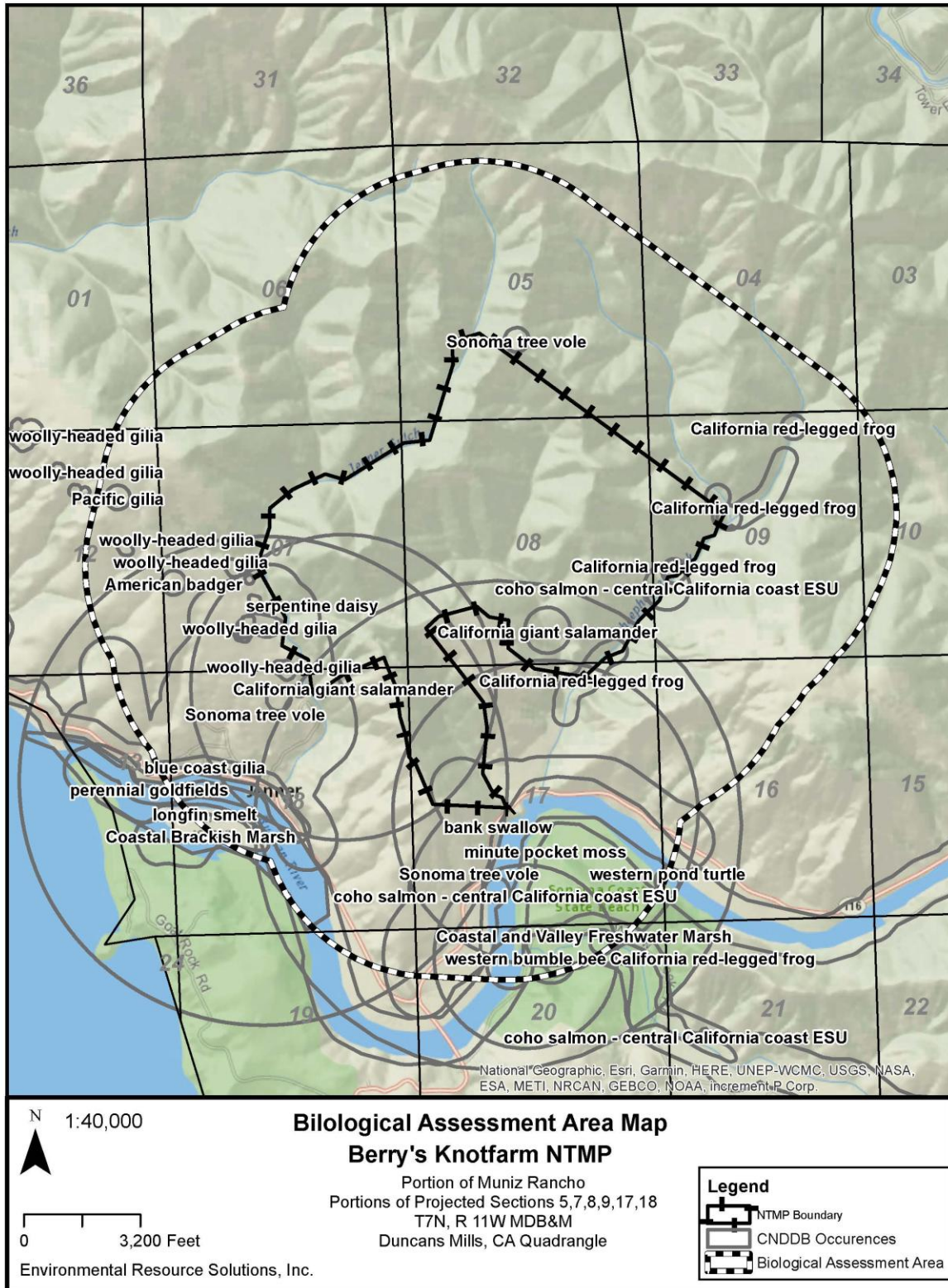
The Biological Assessment Area (BAA) is a .7-mile radius around the NTMP. This area corresponds to the current Spotted Owl Survey Radius and was selected to assess habitat changes in the vicinity of the NTMP. This area, including the NTMP is 4,852 acres. There has been one approved timber harvest plan within the Biological Assessment Area (BAA) within the last ten years. There are no THP's or NTMP's currently known to be proposed within the BAA other than this proposed NTMP. This plan accounts for 23% (1,098 acres) of the BAA. Details of these projects are listed in the following table.

**Biological Assessment Area  
.7-Mile Radius around the NTMP Area (4,851 acres)  
Proposed, Current, and Past 10 years Timber Harvest Plans**

NTMP #	Acres in BAA	% Of BAA	Silviculture	Yarding	Status	General Location (MDBM)
<b>Proposed</b>						
1-24NTMP-(this plan)-SON	1,099	22.6	Selection	Tractor/Cable	Proposed	Portion of Sec 5, 7, 8, 9, 17, 18 T7N R11W MDB&M
<b>Past</b>						
1-15-065-SON Jenner Headlands Restoration THP	99	2.0	Selection	Tractor	Approved	Portions of Sec 5, 6, 7 T7N R11W MDB&M
1-12-040-SON Approved in 2018	90	1.86	Selection	TR/Skidder Cable, high lead	Approved	Portions of Projected Sections 7, 8, 17 T7N, R11W Muniz Rancho MDBM
1-23EX-00663-SON	35	0.72	Forest Fire Prevention	TR/Skidder Feller Buncher	Approved	Portions of Projected Sections 5, 7, 8 T7N, R11W Muniz Rancho MDBM
1-21EX-01114-SON	34	0.70	Forest Fire Prevention	TR/Skidder Feller Buncher	Complete	Portions of Projected Sections 7, 8, 17 T7N, R11W Muniz Rancho MDBM
<b>TOTAL</b>	1,356	27.95				

The effects of past harvests on spotted owl habitat are addressed in the current Northern Spotted Owl report which will be amended to the plan prior to operations for each NTO.

A CCSTA is located in Jenner Gulch and Sheephouse Creek where the public values include significant animal and plant habitat.



## 1. Rare, Threatened, Endangered, and/or Sensitive species that may be affected

A eight-quad search centered on the Duncans Mills USGS quadrangle in which the NTMP is located was performed using California Fish and Wildlife's RareFind search engine to identify rare, threatened, endangered and/or sensitive wildlife and plant species listed in the California Natural Diversity Database (CNDDDB). The ninth quad is not present as that area is the Pacific Ocean. The list includes species listed by both the Federal Endangered Species Act and by the California Endangered Species Act. A second search was conducted of the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants. USGS quadrangles searched were Fort Ross, Guerneville, Cazadero, Duncans Mills, Camp Meeker, Arched Rock, Valley Ford, and Bodega Head. Additionally, the Board of Forestry (BOF) has designated 11 Sensitive Species in 14 CCR 895.1. Those sensitive species for which potential habitat exists within the biological assessment area are additionally addressed.

Two list tables are presented in the following pages:

- List 1 contains all species listed as **rare, threatened, endangered, species of special concern or sensitive** identified in the search.
- List 2 contains all plant species of concern for which potential habitat may exist in the NTMP. These include species listed in the CNDDDB database, and those listed as 1B.

The full CNDDDB and CNPS search reports can be found in section 5.

A rare plant assessment and field survey was conducted of the NTMP area in 2024 and a report prepared by Salix Natural Resource Management. A seasonally appropriate floristic survey, in accordance with current protocol, will be amended to the NTMP prior to the Submittal of an NTO. If any state or federally listed threatened, endangered, or rare species are identified, CDFW will be consulted and protection measures will be included in the NTO. Surveys are considered valid for a period of 5 years.

Section II, Item 32 requires updated biological scoping to be conducted prior to submission of an NTO. If any new rare, threatened or endangered under Federal or State law, or a sensitive species by the Board of Forestry, are identified the RPF shall address potential adverse impact to the species and amend protection measures, if appropriate, to the NTMP.

### Codes for "Other" status in Tables 1 and 2

SSC	Species of Special Concern, CDFW
BOF	Board of Forestry Sensitive
1A	CNPS Extirpated in CA and rare or extinct elsewhere
1B	CNPS Rare, Threatened, or Endangered in CA and elsewhere
2A	CNPS Extirpated in CA but common elsewhere
2B	CNPS Rare, Threatened, or Endangered in CA but more common elsewhere
3	CNPS Plants about which more information is needed
4	CNPS Plants of limited distribution

**List 1**  
**California Department of Fish and Game Natural Diversity Database (CNDDDB)**  
**State and Federally Listed Threatened, Endangered, Rare, and Sensitive Species that may be affected**  
&  
**California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS)**  
**Listed Threatened, Endangered, and Rare plants that may be affected**  
located in the following CA quadrangles  
(Fort Ross, Guerneville, Cazadero, Duncans Mills, Camp Meeker, Arched Rock, Valley Ford, Bodega Head)

Common Name	Scientific Name	Fed Status	CA Status	Other
<b><u>Birds</u></b>				
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Threatened	Endangered	BOF
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	Threatened	Threatened	BOF
Osprey	<i>Pandion haliaetus</i>	None	None	BOF
Great Blue Heron	<i>Ardea Herodias</i>	None	None	SSC
Great Egret	<i>Ardea alba</i>	None	None	SSC
Burrowing owl	<i>Athene cunicularia</i>	None	None	SSC
Black swift	<i>Cypseloides niger</i>	None	None	SSC
Bank swallow	<i>Riparia riparia</i>	None	Threatened	
Tufted puffin	<i>Fratercula cirrhata</i>	None	None	SSC
Tricolored blackbird	<i>Agelaius tricolor</i>	None	Threatened	SSC
Western snowy plover	<i>Charadrius nivosus nivosus</i>	Threatened	None	SSC
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	Threatened	Endangered	
<b><u>Fish</u></b>				
Central Calif. Coho salmon	<i>Oncorhynchus kisutch</i>	Endangered	Endangered	
Central Calif. Steelhead	<i>Oncorhynchus mykiss irideus pop 8</i>	Threatened	None	
Northern Calif. Steelhead	<i>Oncorhynchus mykiss irideus pop 49</i>	Threatened	None	
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	Threatened	None	
Longfin smelt	<i>Spirinchus thaleichthys</i>	Candidate	Threatened	
Russian River tule perch	<i>Hysteroecarpus traski pomo</i>	None	None	SSC
Gualala roach	<i>Hesperoleucus parvipinnis</i>	None	None	SSC
Eulachon	<i>Thaleichthys pacificus</i>	Threatened	None	
Tidewater Goby	<i>Eucyclogobius newberryi</i>	Endangered	None	SSC
<b><u>Amphibians</u></b>				
California red-legged frog	<i>Rana draytonii</i>	Threatened	None	SSC
California Giant Salamander	<i>Dicamptodon ensatus</i>	None	None	SSC
Red-bellied newt	<i>Taricha rivularis</i>	None	None	SSC
<b><u>Reptiles</u></b>				
Western pond turtle	<i>Emys marmorata</i>	Candidate	None	SSC
<b><u>Invertebrates</u></b>				
California freshwater shrimp	<i>Syncaris pacifica</i>	Endangered	Endangered	
Myrtle's silverspot	<i>Speyeria zerene myrtleae</i>	None	Endangered	
Western Bumble Bee	<i>Bombus occidentalis occidentalis</i>	None	Candidate	
<b><u>Mammals</u></b>				
American badger	<i>Taxidea taxus</i>	None	None	SSC
Pallid bat	<i>Antrozous pallidus</i>	None	None	SSC
Sonoma tree vole	<i>Arborimus pomo</i>	None	None	SSC
Western red bat	<i>Lasiurus blossevillii</i>	None	None	SSC
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	None	None	SSC
<b><u>Plants</u></b>				
Pennell's bird's-beak	<i>Cordylanthus tenuis spp. capillaris</i>	Endangered	Rare	1B.2
Baker's larkspur	<i>Delphinium bakeri</i>	Endangered	Endangered	1B.1
Contra Costa goldfields	<i>Lasthenia conjugens</i>	Endangered	None	1B.1
North Coast semaphore grass	<i>Pleuropogon hooverianus</i>	None	Threatened	1B.1
Sebastopol meadowfoam	<i>Limnanthes vincularis</i>	Endangered	Endangered	1B.1

Sonoma Alopecurus	<i>Alopecurus aequalis var. sonomensis</i>	Endangered	None	1B.1
Sonoma spineflower	<i>Chorizanthe valida</i>	Endangered	Endangered	1B.1
Tidestrom's lupine	<i>Lupinus tidestromii</i>	Endangered	Endangered	1B.1
<b>Common Name</b>	<b>Scientific Name</b>	<b>Fed Status</b>	<b>CA Status</b>	<b>Other</b>
Two-fork clover	<i>Trifolium amoenum</i>	Endangered	None	1B.1
The Cedars Manzanita	<i>Arctostaphylos bakeri ssp. Sublaevis</i>	None	Rare	1B.2
Baker's Manzanita	<i>Arctostaphylos bakeri ssp. Bakeri</i>	None	Rare	1B.1
Golden Larkspur	<i>Delphinium luteum</i>	Endangered	Rare	1B.1

## List 2

### California Department of Fish and Game Natural Diversity Database (CNDDB) Species of Concern with Potential Habitat in the NMTP

&

### California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS) Plant Species of Concern with Potential Habitat in the NTMP

Common Name	Scientific Name	Fed Status	CA Status	Other
<b><u>Birds</u></b>				
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	Threatened	Threatened	BOF
Osprey	<i>Pandion haliaetus</i>	None	None	BOF
<b><u>Amphibians</u></b>				
California red-legged frog	<i>Rana draytonii</i>	Threatened	None	SSC
California Giant Salamander	<i>Dicamptodon ensatus</i>	None	None	SSC
Red-bellied newt	<i>Taricha rivularis</i>	None	None	SSC
<b><u>Reptiles</u></b>				
Western pond turtle	<i>Emys marmorata</i>	Candidate	None	SSC
<b><u>Invertebrates</u></b>				
Western Bumble Bee	<i>Bombus occidentalis occidentalis</i>	None	Candidate	
<b><u>Mammals</u></b>				
American badger	<i>Taxidea taxus</i>	None	None	SSC
Pallid bat	<i>Antrozous pallidus</i>	None	None	SSC
Sonoma tree vole	<i>Arborimus pomo</i>	None	None	SSC
Western red bat	<i>Lasiurus blossevillii</i>	None	None	SSC
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	None	None	SSC
<b><u>Plants</u></b>				
Pink Star Tulip	<i>Calochortus uniflorus</i>	None	None	4.2
Coastal Bluff Morning Glory	<i>Calystegia purpurata ssp. Saxicola</i>	None	None	1B.2
Mountain Lady's Slipper	<i>Cypripedium montanum</i>	None	None	4.2
Western Leatherwood	<i>Dirca occidentalis</i>	None	None	1B.2
Swamp Harebell	<i>Eastwoodiella californica</i>	None	None	1B.2
California Bottle-brush grass	<i>Elymus californicus</i>	None	None	4.3
Streamside Daisy	<i>Erigeon biolettii</i>	None	None	3
Minute pocket moss	<i>Fissidens pauperculus</i>	None	None	1B.2
Harlequin lotus	<i>Hosackia gracilis</i>	None	None	4.2
Small Groundcone	<i>Kopsiopsis hookeri</i>	None	None	2B.3
Marsh Pea	<i>Lathyrus palustris</i>	None	None	2B.2
White-flowered rein orchid	<i>Plperia candida</i>	None	None	1B.2
North Coast semaphore grass	<i>Pleuopogon hooverianus</i>	None	Threatened	1B.1
Angel's hair lichen	<i>Ramalina thrausta</i>	None	None	2B.1
Lobb's aquatic buttercup	<i>Ranunculus lobbii</i>	None	None	4.2
Methuselah's bear lichen	<i>Usnea longissimi</i>	None	None	4.2

## 2. Significant wildlife or fisheries resource concerns

### Fish Species

#### Anadromous Salmonids

- Central California Coho Salmon (*Oncorhynchus kisutch*)
- California Chinook Salmon (*Oncorhynchus tshawytscha*)
- Central California Steelhead (*Oncorhynchus mykiss irideus*)

The Willow Creek Planning Watershed contains significant tributaries to the Russian River. Sheephouse Creek supports and currently provides habitat for anadromous salmonids and sediment inputs from the proposed project are a concern. A tributary to Sheephouse creek flows from the plan area and has reaches of Class II(L) and Class I before the confluence. Jenner Gulch has a blockage near the town of Jenner and is considered a Class II(s). These streams are listed under 303(d), as sediment impacts in Russian River tributaries prompted listing the entire Russian River watershed for sediment. Watercourses in the Plan area will be protected according to the Anadromous Salmonid Protection Rules (ASP). The ASP rules will reduce the likelihood of sediment impacts to downstream anadromous salmonid habitat.

#### Other Fishery Resource Concerns

- Longfin smelt (*Spirinchus thaleichthys*)
- Gualala Roach (*Hesperoleucus parvipinnis*)
- Russian River tule perch (*Hysterocarpus traski pomo*)
- Eulachon (*Thaleichthys pacificus*)
- Tidewater Goby (*Eucyclogobius newberryi*)

Fisheries resources within the BAA are Class I watercourses. Protection measures have been designated to reduce sediment loads downstream of the NTMP area that include: watercourse buffers (ASP), correcting drainage on roads, armoring inlets and outlets of culverts, re-using existing roads and skid trails, limiting new road construction, soil stabilization and general improvements to the road system; these measures will reduce total sediment contributions downstream.

### Amphibians

#### California Giant Salamander (*Dicamptodon ensatus*)

The California giant salamander occurs in wet coastal forest in or near clear, cold permanent and semi-permanent streams and seepages and occurs from sea level to near 3,000 feet. Habitat may exist in the Class II watercourse running through the NTMP. Given the WLPZ protection rules provided by the FPRs, no operations related to the NTMP should result in significant adverse loss of the habitat within the plan area or to potential populations within the BAA.

#### California Tiger Salamander (*Ambystoma californiense*)

The California tiger salamander occurs in vernal pools within grassland habitats from sea level to approximately 1,000 feet. Potential habitat may exist near the NTMP, but the NTMP itself is

mostly forested. The NTMP is 14 miles away from the CWHR range provided by BIOS (last updated 2020), but unprocessed data points came up within the 9-quad search. The California tiger salamander is not likely to occur within the BAA.

#### California Red-legged Frog (*Rana draytonii*)

The California Red-legged frog (CRLF) is listed as federally threatened. All of Sonoma County is identified as being within the current range of CRLF. The NTMP area contains suitable habitat for the California-Red-Legged Frog. The NTMP Section II prescribes protection measures as recommended by the USFWS (2008).

The NTMP area contains suitable habitat to support CRLF which have been detected and reported to CNDDDB in the lower and upper reaches of Sheephouse Creek, adjacent to the NTMP. CRLF has not been detected along upper Willig Gulch and presence is unlikely due to lack of pool cover.

Jenner Gulch contains marginal habitat for RLF as there is very little stream bank vegetation. Sawmill Gulch contains suitable habitat.

Willig Gulch contains marginal habitat as there are pools but without cover and no permanent water between pools.

#### Foothill yellow-legged frog (*Rana boyii*)

According to the Fish and wildlife Commission Notice of Findings for the Foothill Yellow-legged frog (FYLF) dated March 2020, the listing of the Northwest/North Coast clade is not warranted at this time. The Northwest/North Coast clade extends from north of San Francisco Bay through the Coast Range and Klamath Mountains to the northern limit of the species range and east through the Cascade Range. Therefore, in Sonoma County FYLF is not CESA listed. Suitable habitat is present in Sheephouse Creek. Jenner Gulch contains high quality habitat with many riffles, consistently flowing shallow water, rocky substrate, and banks open to sunlight. Sawmill gulch contains marginal habitat with low flow, little rocky substrate, and high shade. Willig Gulch contains poor habitat with no flow during summer months or low rainfall periods, and high shade.

### **Reptiles**

#### Western Pond Turtle (*Actinemys marmorata*)

The western pond turtle is found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodlands, forest, and grasslands. In streams, it prefers pools to swallower areas. Logs, rocks, cattail mats and exposed banks are required for basking. It eats aquatic plants, invertebrates, worms, frogs and salamander eggs and larvae, crayfish, carrion, and occasionally frogs and fish. Habitat may exist in the Class IIs watercourse running through the NTMP. Given the WLPZ protection rules provided by the FPRs, no operations related to the NTMP should result in significant adverse loss of habitat within the plan area or to potential populations within the BAA.

## **Mammals**

### American Badger (*Taxidea taxus*)

The American Badger is stocky and low-slung with large foreclaws and distinctive head markings. It is listed by the California Fish and Game Commission as a Species of Special Concern. Badgers prefer treeless areas and grasslands. Burrows often have 2-4 entrances in close proximity. Habitat is not present in the NTMP. The American Badger is unlikely to occur in the BAA.

### Pallid Bat (*Antrozous pallidus*)

The Pallid Bat is a large-sized bat with large pointed ears and brown fur. They have a blunt piglike snout. It is listed by the California Fish and Game Commission as a Species of Special Concern. Pallid bats are found in arid or semi-arid environments often near water and require heavily shaded areas such as cracks and crevices for daytime roosts. The bat feeds over a wide variety of habitats including grasslands, shrublands, open woodlands and forest, and croplands. Presence of this bat has not been observed within the NTMP area but, if present, WLPZ protection, silvicultural retention, and wildlife tree retention in the NTMP will reduce the likelihood of impacts to bat populations within the BAA.

### Western Red Bat (*Lasiurus blossevillii*)

The Western Red Bat is a medium- sized bat with fur that is usually mottled reddish and grayish, but can range from bright orange to yellow-brown. It is listed by the California Fish and Game Commission as a Species of Special Concern. Red bats prefer heavily shaded areas, which are open underneath, enabling them to drop into flight. Roosting habitat includes forests and woodlands from sea level up through mixed conifer forests and have been known to roost in fruit tree orchards. The bat feeds over a wide variety of habitats including grasslands, shrublands, open woodlands and forest, and croplands. If roosting in dense foliage, they can resemble dead leaves. Presence of this bat has not been observed within the NTMP area but, if present, WLPZ protection, silvicultural retention, and wildlife tree retention in the NTMP will reduce the likelihood of impacts to bat populations within the BAA.

### Pacific Fisher (*Pekania pennanti*)

Fishers are a CDFW Species of Special Concern. Habitat is suitable within the NTMP area and includes intermediate to large trees with dense canopy. Dens may be found in tree cavities, logs and rocky outcrops. Sonoma County is considered an area where fishers are rare or absent. If a fisher is observed during operations, operations will stop within ½ mile of that area. Appropriate measures will be requested from a qualified biologist and CDFW will be notified.

### Townsend's Big-Eared Bat (*Corynorhinus townsendii*)

Townsend's big-eared bats are a CDFW Species of Special Concern. Townsend's big-eared bats are most common in mesic sites but are found in a variety of habitats including coastal conifer and broad-leaf forests, oak and conifer woodlands, arid grasslands and deserts, and high-elevation forests and meadows. Roosting, maternity and hibernacula sites in California include limestone caves, lava tubes, mine tunnels, buildings, and other man-made structures (Williams 1986). The majority of cave, mine and building roosts examined in California are fairly spacious, at least 30 m (98 ft) in length, with the roosting area located at least 2 m (6.5 ft) above ground,

and a roost opening at least 15 cm by 62 cm (6 inches by 24 inches) (Pierson et al. 1991). In northern California, Marcot (1984) found caves occupied by the bats in an oak woodland with subdominants of Douglas-fir and ponderosa pine. Cave entrances were at 2600-3900 feet in elevation, faced southeast to south west, and were 16-490 feet from perennial streams.

In the coastal forests of northern California, this species is known to roost in large basal hollows of old growth redwood trees (Fellers and Pierson 2002, Mazurek 2004).

The plan area does not contain habitat conducive to potential maternity roosts or hibernacula (mine shafts, caves, abandoned structures, large trees with large basal hollows). No significant impact to this species is expected.

#### Gray Wolf (*Canis lupus*)

In 2020 a breeding pair established itself in Plumas County near the California-Nevada border. And in early in 2021 a lone male made the longest known tracked journey of any wolf over the last century, leaving his home range in Oregon and making it into California's central valley. Wolves are habitat generalists and historic abundance and distribution is unknown. This NTMP lies outside the current known range of gray wolf. Potential occurrence of gray wolf in the NTMP area is considered unlikely.

The gray wolf is listed as an endangered species under the California Endangered Species Act as of June 4, 2014. Breeding occurs in winter and young are born in February. The NTMP provides that should sightings of wolves occur, they will immediately be reported to CAL FIRE and CDFW. It additionally requires that if detections of den/rendezvous sites occur, operations will halt until consultation with CAL FIRE and CDFW have occurred and the results of that consultation amended into the NTMP.

#### Humboldt Marten (*Martes caurina humboldtensis*)

The Humboldt Marten is listed as federally threatened and state endangered. The current known populations of the Humboldt Marten are located in one area in extreme northwestern California east of the town of Klamath. The CNDDDB also reports incidental sightings of Humboldt Marten in Humboldt County north of the Van Duzen River. If a marten is observed during operations, operations will stop within ½ mile of that area. Appropriate measures will be requested from a qualified biologist and CDFW will be notified.

The NTMP lies within the historic range of the Humboldt Marten, but outside of its current known range. The NTMP area is located within the extreme southern tip of the historic range of the Humboldt Marten and the probability that the Marten may be present in the biological assessment area now or in the foreseeable future is considered to be very low.

#### Sonoma Tree Vole (*Arborimus pomo*)

The Sonoma tree vole occupies mixed evergreen forest, especially late-seral Douglas-fir Forest. This vole is primarily arboreal, nesting in Douglas-fir trees, but sometimes may be in other conifers or in Pacific Madrone. It also exhibits some terrestrial activity. It may use old nests of birds, squirrels, or woodrats. Within the past few years, it has been found that the vole is common in young stands of Douglas-fir. Sonoma tree vole nest have been documented in the NTMP vicinity but not within the NTMP. Protection measures are in Section II, Item 38.

## **Bird Species**

### Northern Spotted Owl (*Strix occidentalis caurina*)

Status: Federally Threatened, State Threatened, Board of Forestry Sensitive

Timber harvesting has the potential to modify wildlife habitat in the project area. Canopy retention and snag protection provided by the proposed silviculture and FPRs will protect NSO habitat. NSO surveys have been and are being conducted in the project area. No timber operations shall occur until a CAL FIRE consistency determination has been amended to the NTMP.

### Osprey (*Pandion haliaetus*)

Status: Board of Forestry Sensitive

Ospreys are known to fly the Russian River corridor and may be observed in adjacent waterways. More information and protections are in Section II, Item 32.

### Great Gray Owl (*Strix nebulosi*)

Status: State Endangered, Board of Forestry Sensitive

Habitat Requirements: Nests usually are placed in the broken tops of snags or large conifer trees, 35 feet or more from the ground. Great gray owls are found in or near meadows within forest habitats. Important meadow characteristics include meadow size, the height of grass, the portion of the meadow covered by nongrass-forb vegetation, and the livestock grazing pressure. Forests surrounding meadows require a high density of large diameter snags for nests and a high canopy closure to provide cover and a cooler sub-canopy microclimate. The potential exists by definition, however, the Great gray owl has not recently been found to be active in the coast range. They are predominately found in the Sierra foothills.

### California Condor (*Gymnogyps californianus*)

Status: Federal Endangered, State Endangered, Board of Forestry Sensitive

Habitat Requirements: Condor nest sites are in cliff caves in the mountains. Some condors have nested in large cavities in the trunks of giant sequoia redwood trees. There are no suitable nesting sites within the plan area.

### Bald Eagle (*Haliaeetus leucocephalus*)

Status: Federal Threatened, State Endangered, Board of Forestry Sensitive

Habitat Requirements: Distributed throughout northern and central California, the Bald Eagle is dependent upon large bodies of water supporting adequate fish populations. Nesting territories include mature mixed-conifers with snags and dead-topped trees usually in isolated mountainous areas. The potential exists within the BAA, there are no known nests located within or near the plan area.

### American Peregrine Falcon (*Falco peregrinus anatum*)

Status: State Endangered, Federal Delisted, Board of Forestry Sensitive

Habitat Requirements: The Peregrine Falcon is distributed throughout most of northern and central California. This species can be found on rocky outcroppings with panoramic views of open

country. Nest locations are associated with an abundance of passerine, waterfowl or shorebird prey. No potential nesting areas were located during field visits within the plan area. It is unknown whether the BAA supports any of this habitat type.

Northern Goshawk (*Accipiter gentilis*)

Status: State Species of Concern, Board of Forestry Sensitive

Habitat Requirements: Interiors of extensive, mature forests dominated by large trees, high canopy closure, on moderate slope, with an open understory. Forest cover types used for nesting include deciduous, conifer and mixed. Occupancy increases dramatically in stands > 70% canopy. The potential for Northern Goshawk habitat is very low considering that lack of continuous late-seral forest structure within the BAA.

Golden Eagle (*Aquila chrysaetos*)

Status: State Species of Concern, Board of Forestry Sensitive

Habitat Requirements: Habitat generally consists of open country, in prairies, open coniferous forest and barren areas, especially in hilly or mountainous regions, nesting on cliff ledges and in trees. There is potential habitat within the BAA but no habitat within the NTMP.

Great Blue Heron (*Ardea herodias*)

Status: Board of Forestry Sensitive

Habitat Requirements: These species are common in California and forage along large bodies of water in a variety of mixed habitats. These birds nest in rookeries, often in mixed species, in large trees. There is habitat within the BAA but habitat is marginal within the NTMP.

Great Egret (*Ardea alba*)

Status: Board of Forestry Sensitive

Habitat Requirements: These species are common in California and forage along large bodies of water in a variety of mixed habitats. These birds nest in rookeries, often in mixed species, in large trees. There is habitat within the BAA but habitat is marginal within the NTMP.

Marbled Murrelet (*Brachyramphus marmoratus*)

Status: Federally Threatened, State Endangered, Board of Forestry Sensitive

The plan area is located in the known range of the marbled murrelet. A few marbled murrelet surveys have been completed on the Russian River corridor, but no positive detections (probable absence) have been made. The only positive inland detections in the region that have been made are in the South Fork Gualala River near Stewart's Point. There is no suitable habitat in the plan area.

Bank swallow (*Riparia riparia*)

Bank swallows have been detected near the plan area, in the Class I watercourse corridors. WLPZ protection measures will protect this species. More information is included in Section II.

Other Bird Species

Western snowy plover (*Charadrius alexandrinus nivosus*)

Black Swift (*Cypseloides niger*)

Burrowing Owl (*Athene cunicularia*)

Tricolored blackbird (*Agelaius tricolor*)  
Wester Yellow-billed cuckoo (*Coccyzus americanus occidentalis*)

Habitat does not occur in the plan area for the above bird species that the 9 quad CNDDDB and USFWS search provided.

### **Invertebrates**

#### California Freshwater Shrimp (*Syncaris pacifica*)

The California Freshwater Shrimp exists in the perennial freshwater stream systems of Marin, Sonoma, and Napa counties at low population numbers. The BAA contains class 1 and II-L that may provide suitable habitat. Regardless, there will be no operations within the channel zones. Maintaining a continuous forest canopy along riparian areas, combined with the protection of channel structure, will provide continued habitat for the California Freshwater Shrimp. No significant adverse loss of habitat is anticipated.

#### Western Bumble Bee (*Bombus occidentalis*)

The Western Bumble bee occurs along the Pacific coast and western interior of North America, from Arizona, New Mexico and California, north through the Pacific Northwest and into Alaska.

The NTMP contains a pasture which is included because an existing haul route bisects it with existing landings along the roads. Operations are proposed to utilize existing infrastructure to minimize new disturbances. The pasture contains flowering shrubs and forbes but not in relative abundance. Due to these circumstances, significant impacts to bumble bee populations are not expected.

#### Myrtle's Silverspot Butterfly (*Speyeria zerene myrtleae*)

Myrtle's silverspot butterfly inhabits sand dune and coastal prairie habitat. There is potential habitat in the BAA but there is none within the NTMP.

### **Plants**

#### Angel's Hair Lichen (*Ramalina thrausta*)

Angel's Hair Lichen is associated with North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

#### Sonoma alopecurus (*Alopecurus aequalis var. sonomensis*)

The Sonoma alopecurus inhabits wet meadows and riparian edges associated with ponds and ditches. There is minor habitat potential for the Sonoma alopecurus within the plan area. WLPZ protection measures will protect against adverse loss of habitat if present.

#### Pennell's bird's-beak (*Cordylanthus tenuis spp. capillaris*)

Pennell's bird's-beak inhabits serpentine soils associated with chaparral plant communities. This habitat does not exist within the plan area.

Baker's larkspur (*Delphinium bakeri*)

Baker's larkspur is associated with decomposed shale soils and coastal scrub plant communities. This habitat does not exist within the plan area.

Baker's manzanita (*Arctostaphylos bakeri ssp. Bakeri*)

Baker's manzanita is associated with broadleafed upland forest and chaparral communities. This habitat does not exist within the plan area.

California Bottle-brush grass (*Elymus californicus*)

California Bottle-brush grass is associated with Broadleaf upland forest, cismontane woodland, North Coast coniferous forest, and riparian woodland. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Coastal Bluff Morning Glory (*Calystegia purpurata ssp. Saxicola*)

Coastal Bluff Morning Glory is associated with Coastal dunes, Coastal scrub, and North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Contra Costa Goldfields (*Lasthenia conjugens*)

Contra Costa Goldfields is a species associated with vernal pools habitat. This habitat does not exist within the plan area.

Golden larkspur (*Delphinium luteum*)

Golden larkspur is associated with decomposed shale soils and coastal scrub plant communities. This habitat does not exist within the plan area.

Harlequin lotus (*Hosackia gracilis*)

Harlequin lotus is associated with Broadland upland forest, Cismontane woodland, closed-cone coniferous forest, coastal prairie, marshes and swamps, meadows and seeps, and North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Lobb's aquatic buttercup (*Ranunculus lobbii*)

Lobb's aquatic buttercup is associated with Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, and vernal pools. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Marsh Pea (*Lathyrus palustris*)

Marsh Pea is associated with Bogs and fens, Coastal prairie, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, and North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Minute pocket moss (*Fissidens pauperculus*)

Minute pocket moss is associated with damp coastal soils within North Coast coniferous forests.

Habitat exists within the plan area. WLPZ protection measures will protect against adverse loss of habitat if present.

Methuselah's beard lichen (*Usnea longissimi*)

Methuselah's beard lichen is associated with Broadleaf upland forest and North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Mountain Lady's Slipper (*Cypripedium montanum*)

Mountain Lady's Slipper is associated with Broadleaf upland forest, Cismontane woodland, Lower montane coniferous forest, and North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

North Coast semaphore grass (*Pleuropogon hooverianus*)

North Coast semaphore grass grows primarily in moist marshy areas associated with redwood forest types. There is minor habitat potential for this species within the plan area. WLPZ protection measures will protect against adverse loss of habitat if present.

Pink Star Tulip (*Calochortus uniflorus*)

Pink Star Tulip is associated with coastal prairie, coastal scrub, meadows and seeps, and North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Sebastopol meadowfoam (*Limnanthes vinculans*)

The Sebastopol meadowfoam is limited to vernal pools and wetland habitat at elevations under 300 meters. There is minor habitat potential for the Sebastopol meadowfoam within the plan area. WLPZ protection measures will protect against adverse loss of habitat if present.

Small groundcone (*Kopsiopsis hookeri*)

Small groundcone is associated with Lower montane coniferous forest, North Coast coniferous forest, and Upper montane coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Two-fork clover (*Trifolium amoenum*)

Two-fork clover is associated with grassland plant communities north of San Francisco Bay. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during the targeted plant survey.

Sonoma spineflower (*Chorizanthe valida*)

This species is found on coastal prairies with deep sandy soils. This habitat does not exist within the plan area.

Streamside Daisy (*Erigeon biolettii*)

Streamside Daisy is associated with mesic or rocky sites in Broadleafed upland forest, Cismontane

woodland, and North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during targeted plant surveys.

Swamp Harebell (*Campanula californica*)

This species is associated with bogs and fens, closed-cone conifer forest, coastal prairie, marshes and swamps, meadows and seeps, and north coast coniferous forest. North coast coniferous forest is found in the plan area. Protection measures will be developed and approved by CDFW if species is discovered during the targeted plant survey.

Tidestrom's lupine (*Lupinus tidestromii*)

Tidestrom's lupine is found exclusively in coastal sand dune habitat. This habitat does not exist within the plan area.

The Cedars manzanita (*Arctostaphylos bakeri ssp. sublaevis*)

The Cedars manzanita is found on serpentine chaparral near the coast. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during the targeted plant survey.

Western Leatherwood (*Dirca occidentalis*)

Western Leatherwood is associated with mesic sites within Broadleafed upland forest, Chaparral, Cismontane woodland, Closed-cone coniferous forest, North Coast coniferous forest, and Riparian forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during the targeted plant survey.

White-flowered rein orchid (*Piperia candida*)

White-flowered rein orchid is associated with Broadleaf upland forest, Lower montane coniferous forest, and North Coast coniferous forest. Habitat exists within the plan area. Protection measures will be developed and approved by CDFW if species is discovered during the targeted plant survey.

Other Resource Concerns

Sudden Oak Death (SOD) has the potential to significantly affect the wildlife and fisheries resources within the planning watershed area. SOD is present in the project area at high levels based on RPF observation but has not been verified in a laboratory. The future effects from SOD are unknown at this time. A more thorough discussion of SOD is contained in the watershed analysis section of this cumulative effects analysis.

A wide variety of other biological resources (wildlife and associated habitat) exist within the BAA. Various avian species, foxes, coyotes, mountain lions, and deer are a partial listing of the wildlife species which have been observed, or whose signs have been observed. Timber harvesting operations, with protection measures proposed in this NTMP will avoid significant adverse loss of habitat for species present in the BAA.

## 2. Aquatic and near-water habitat conditions on the NTMP

**a. Pools And Riffles:** Class IIs watercourses within the NTMP boundary flow to Sheephouse Creek, a Class I watercourse. CDFG's Stream Inventory Report for Sheephouse Creek, completed in 2000 and revised in 2006, reported that along 15,851 feet of the main stem, 23% consists of pools, 22% riffles, 51% flatwater and 4% dry streambed. Of the 127 pools, approximately 55% had a maximum depth greater than 2 feet.

The Class I tributary (Willig Gulch) was surveyed for 7,088 feet until salmonid habitat became unsuitable. Of the total surveyed length, 79% was dry streambed, 8% riffles, 8% flatwater, and 5% pools.

These numbers generally match the observations of the RPF.

**b. Large Woody Material:** Large woody material was observed in the Class I and Class II watercourses at moderate levels and in varying states of decomposition. No logging slash will be deposited into these watercourses during harvesting operations, and as such, will not cause significant decreases in dissolved oxygen levels or increased acidity levels in watercourses.

**c. Near-Water Vegetation:** All of the watercourses within the NTMP area have near-water vegetation consisting of riparian forbs, shrubs, and trees. Riparian vegetation provides soil cover and stability which reduces erosion from soil detachment. Near-water vegetation provides watercourse shading for temperature control and cover for fish and other aquatic wildlife. No significant changes to near-water vegetation are anticipated as a result of harvest operations. Watercourse shading and bank stability will continue to be provided by operational restrictions including tree retention within the WLPZ.

## 3. Biological Habitat Condition of the NTMP and immediate area

**a. Snags/Dens/Nest Trees:** Scattered snags are present in the NTMP area at low to moderate density. No dens were observed on the NTMP area. Few large trees exist within the NTMP areas that could support large nests. Some have historic fire scars to an extent that may eventually serve as dens. All trees showing evidence of recent den/nest use will be retained. Snags will not be cut unless deemed a safety, fire, or other hazard as described in NTMP Section II. The NTMP will have minimal impact on the current level of snags, dens, and nest trees.

**b. Downed Large Woody Debris:** Large woody debris on the forest floor provides functional habitat for a variety of wildlife. This material is present in low amounts on the NTMP area. This material is generally unmerchantable and will remain on site. Timber harvest operations will create additional downed large woody debris by leaving bucked unmerchantable log segments in the forest and some piles of cull logs on landings at the conclusion of timber operations. The NTMP is anticipated to increase the levels of downed large woody debris, thereby creating additional habitat for species that rely on this type of resource.

**c. Multistory Canopy:** This structure is present in the NTMP area. Timber stands with substantial vertical development have developed throughout the last fifty years on the NTMP area. Dominant, codominant, intermediate, and suppressed trees contribute to multistory canopy. Selection silviculture will leave trees of all sizes throughout the stand which will continue to provide multistory canopy. Timber harvesting will create new gaps and allow regeneration to provide the lower canopy which will develop through time into larger canopies, thereby providing continuity of this resource throughout the life of the NTMP.

**d. Road Density:** No new road construction is proposed for this NTMP. Existing seasonal roads used for fire access and property maintenance will be used for the harvest operations and upgraded where necessary. Once the harvest operations conclude, there will be minimal traffic on these roads because the property is private ownership and does not allow public access. Road use will be limited and infrequent.

In total, there are approximately 24 miles of paved and unpaved road within the Biological Assessment Area of approximately 4,851 acres. This was determined using both Sonoma County and custom-built road layers in GIS for total road length. Road widths were based on road classifications according to the GIS layers; seasonal and rural residential roads are assumed to be 15 ft. wide. Permanent roads are assumed to be 20 feet wide, and highways are assumed to be 30 feet wide. Using these values, it was determined that approximately 48 acres (1% of the total BAA area) is road area.

**e. Hardwood Cover:** Hardwoods are present in the plan area and competition from hardwoods restricts conifer stocking and growth rates. Sudden Oak Death (SOD) is apparently present throughout the plan area and has the potential to significantly impact the hardwood component within the NTMP, BAA, and WAA. Recognizing that hardwoods are an important ecological component of this forest, the NTMP proposes to retain the larger hardwoods.

**f. Late Seral (Mature) Forest Characteristics:** Late seral forest stands are characterized as stands of dominant and predominant trees that meet the criteria of WHR class 5M, 5D, or 6 (> 24" DBH medium/large trees, multilayered, 40-100% canopy closure) with an open, moderate or dense canopy closure classification, often with multiple canopy layers, and are at least 20 acres in size. Functional characteristics include several large coniferous trees per acre as part of a multilayered canopy and the presence of large numbers of conifer snags and an abundance of large, downed logs that contribute to an increased level of stand decadence. Previously harvested stands may be in many possible stages of succession and include individual late seral stage trees. These types of trees are typically retained as wildlife trees, snags, and live culls during harvest operations, unless deemed a safety hazard.

There are scattered large trees present in the NTMP area but no continuous late seral forest exists within the plan area. No impacts to late seral forest stands are anticipated as a result of this NTMP.

**g. Late Seral Habitat Continuity:** No continuity of late seral habitat is known to exist within the BAA. The scattered and infrequent distribution of individual late seral trees does not provide continuity of this habitat type. No impacts to late seral habitat continuity are anticipated as a result of this NTMP.

**h. Special Habitat Elements:** Special habitat elements such as large decadent trees, broken-top trees, snags, culled residuals, etc. occur at a low rate throughout the NTMP area, and most will be retained as wildlife trees, except where deemed a safety hazard. No significant impacts to special habitat elements are anticipated as a result of this NTMP.

***Biological Resources - Effects of past, present, and future projects and activities together with this NTMP within the Biological Assessment Area (BAA)***

*Past Projects*

*Past projects and activities within the BAA are the same as other assessment areas analyzed for this NTMP. They include timber harvesting, agriculture/grazing, wildland burning, road building, development, and recreation.*

- *Timber Harvests within the last 10 years are listed in a table at the beginning of this section, Biological Resources. The earliest timber harvesting in the BAA was conducted without legally enforceable wildlife protection measures or restrictions. Whether or not the landowner or the logger instituted their own personal measures or restrictions is unknown. Wildlife would likely have been directly impacted. Habitats were certainly impacted. Late seral tree characteristics were significantly more abundant than they are today as some of them take hundreds of years to develop. Forest stands in the BAA are in a second or third growth condition today.*
- *Agriculture/Grazing: Grasslands were present in the BAA occupying the same areas they do today. Some clearing may have been conducted to expand openings for grazing. Relatively small amounts of crops were grown near ranches.*
- *Wildland Burning by ranchers was conducted to remove debris, improving access and visibility. Burning probably had negligible long-term effects on wildlife populations. Post fire forage was likely improved.*
- *Road building likely had negligible long-term effects on terrestrial wildlife populations as the area of impact was a small percentage of the overall landscape and traffic levels were low. Fish would have been impacted by sedimentation from fill and sidecast and migration obstruction by watercourse crossings.*
- *Development in the BAA is sparse. The largest development is a subdivision in Jenner. Construction did not occur on many of the lots in that subdivision. A few modest sized homes and outbuildings exist. Development likely had little effect on wildlife populations. Human presence due to the built structures probably had a greater impact.*
- *Recreation other than hunting would have had little effect on wildlife populations. Numbers of local and visiting recreators were much smaller than they are today. Recreational hunting may have had some effect on wildlife populations, particularly if a population was in a precarious state.*

*Current and Ongoing Projects*

- *Timber harvesting is highly regulated. Great effort is made to minimize impact to wildlife. Surveys are conducted. Timing of operations is restricted to avoid noise disturbance and breeding seasons. Direct take of sensitive species is prohibited.*
- *Agriculture/grazing is ongoing at very low levels. Cattle are present on this NTMP property,*

*the neighboring property to the south, and Jenner Headlands Preserve. No crop production is known within the BAA.*

- *Wildland burning is no longer practiced in the same fashion. Broadcast burning is spatially and temporally targeted and controlled as much as possible. Burns are typically five to twenty acres in size. Prescribed burning is likely conducted at a low level within the BAA. Pile burning is conducted annually by residents.*
- *No known development is currently occurring in the BAA.*
- *Recreation in the BAA is limited to Jenner Headlands Preserve, a portion of Sonoma Coast State Park across the river, and driving on Highways 1 and 116.*

### *Future Projects*

*Future projects and activities are anticipated to be similar to current projects and activities although tourism may increase slightly and cattle grazing may persist or cease.*

### *Berry's Knotfarm NTMP:*

*This NTMP will not increase timber harvest levels. Harvesting has been roughly following growth rates for decades using THPs and exemptions.*

*This NTMP includes required protection measures for listed species and considerations for habitat.*

- *Measures for Occupied Nests: If an occupied nest site of a listed bird species be discovered during the timber operations, the timber operator will apply the provisions of 14 CCR 919.2(d) and protect the nest tree, screening trees, perch trees and replacement trees. The timber operator will immediately notify CDFW and Cal Fire for protection measures.*
- *Measures for Fish: Impacts to all fish species that occur or have habitat located within the assessment area will be minimized. The watercourse protection measures listed in Section II, Item 26 and provide for canopy retention, LWD recruitment, and sedimentation prevention. Controllable Sediment Discharge Sources have been identified and prioritized for treatment.*
- *Measures for Amphibians: The watercourse protection measures listed in Section II Item 26 and elsewhere provide for canopy retention, protection for springs, protection for wet areas, Red-legged frogs are present in the NTMP area and measures for protection are incorporated.*
- *Protections for Plants: Several rare plants have the potential to occur in the plan area. A seasonally appropriate floristic survey shall be conducted prior to the submittal of an NTO and shall be amended into the NTMP. Post approval discovery a 25-foot diameter EEZ shall be flagged around the area and trees felled away from the species until a recommendation is made by a qualified botanist or CDFW.*
- *Measures to protect dens and nests: There were no dens observed on the plan area however, non-listed wildlife that utilize dens are known to occur within the BAA. Any den located during operations will be flagged off and protected. Northern Spotted Owls are present within the BAA and have been detected within the NTMP area. The NTMP provides restrictions for NSO core habitat and maintains property wide habitat.*
- *Large hardwoods shall be retained.*

### Impacts Evaluation

*The silviculture used within this NTMP will maintain the forested habitat. Key habitat elements will be protected. Historical human activity has impacted species. Protection measures in this NTMP will prevent exacerbation of those impacts. Foreseeable future projects are not expected to have significant adverse impacts on biological resources because of their small scale and low intensity. The NTMP's impact on wildlife habitat has been thoroughly evaluated within the project area and within the BAA, broadening the context within which the NTMP has been analyzed. Evaluation of interactions of this NTMP with past, current, and future projects on biological resources reveals no significant cumulative impacts.*

### **D. RECREATIONAL RESOURCES**

The assessment area for recreational resources is the logging area and the area within 300 feet that involve significant numbers of people. Recreational activities could include: picnicking, hiking camping, hunting, etc.

The NTMP area is on private property behind closed gates with no public access. Recreational use is limited to hiking, hunting, shooting and sightseeing by the owners, caretakers, and their guests. The timberland owners are aware of potential impacts to recreation resources as a result of timber operations. The landowners' personal recreational uses do not include significant numbers of people, and even if they did, the people recreating would be personally invited by the landowner for exclusive access to the property and subject to visiting terms as prescribed by the landowner.

Directly west of the plan area is the property boundary of Jenner Headlands Preserve, a 5,630-acre property owned and operated by the Wildlands Conservancy with its entrance just northwest of the town of Jenner. Jenner Gulch, a Class II watercourse, flows between the two properties. Public access to the portions of these lands that come into contact with the NTMP is restricted by topography, natural obstructions, and a lack of trails. Part of the NTMP is visible from a trail along the ridge above Jenner Gulch. Viewed horizontally, the single tree selection silviculture will appear the same postharvest as it did preharvest. WLPZ retention measures for Jenner Gulch will also ensure preservation of aesthetic values.

*Sonoma Coast State Park is south of the property, across the Russian River. The state also owns a strip of land isolated between the highway and the river which is considered part of the park property but there is no signage and no public facilities such as a trail or viewing area. A narrow dirt turnout is on the side of the highway. The strip of land is overgrown with trees and brush making it inhospitable to visitors. There is no public access to Sonoma Coast State Park through the NTMP or adjacent properties. It is unlikely there would be any interaction between Park visitors and NTMP operations.*

### Past Activities

*Logging in this area has occurred since the late 1800s. Timber production and agricultural activities were the dominant economic activities until the 1920s. After this period, tourism became*

*the major business in the area and has continued to grow over the last century. The most recent timber harvest on the NTMP area was in 2023.*

*The Sonoma Coast State Park was founded in 1934 and has since expanded with the increased demand for recreational activities in the area (Stewards of the Coast and Redwoods).*

#### Current and Ongoing Projects

*Fuels reduction is ongoing near the NTMP property, consisting of thinning projects and prescribed fire. These projects are occurring within public recreational areas and therefore impact recreational activities. Whether fuel reduction is within the assessment area is unknown.*

*Cattle grazing is ongoing on the NTMP property, the neighbor to the south, and Jenner Headlands Preserve.*

#### Future Projects

*Berry's Knotfarm NTMP:*

*Sonoma Coast State Park and Jenner Headlands visitors are not expected to experience any disturbance from logging activities due to the NTMP area's distance from public use areas and access routes.*

*Livestock grazing is expected to continue.*

#### Impacts Evaluation

*No recreation is occurring within the assessment area. The NTMP together with other projects in the assessment area will not cause or add to significant cumulative impacts to recreational resources.*

### **E. VISUAL RESOURCES**

The assessment area for visual resources is the logging area that is visible to significant numbers of people who are no further than three miles from the timber operations.

Sawmill Gulch CCSTA public values include (A.) Scenic View Corridors.

In order to assess visual resource impacts, a GIS mapping analysis was conducted to identify the area within three miles of the plan boundary and then refine this zone to areas where topography appeared conducive to providing views of the plan area. *Visual resources were also assessed by the RPF and designee technicians from the ground at accessible vantage points.* Due to the topography of the general area, viewsheds of the plan area were limited to areas along Highway 116 and immediately adjacent, upslope, and higher topography areas that were not obscured by other terrain or vegetation features.

As a result of the analysis, the NTMP area is not visible from any significantly populated areas, such as the town of Jenner. The town of Jenner is located approximately 1 mile away from the plan

boundary with substantial topography blocking any potential view of the plan area except for one ridge above Jenner Gulch. Balboa Ave, a residential street in Jenner, overlooks Jenner Gulch and has somewhat unobstructed views of the NTMP area. Due to the WLPZ and unstable area protection measures, harvests on that side of the NTMP will be limited and have minimal impact on visual resources for the town of Jenner.

*Areas along Highway 116 were identified as the most visible regions of the NTMP. Vehicle traffic along Highway 116 will be the closest vantage point, but vehicles will be travelling at 45MPH and there is partial vegetation screening.*

*Using Google Earth, visibility from the Russian River indicates that individuals recreating on the river or at the nearby Willow Creek Environmental Campground would be able to see parts of the NTMP. These areas are the vantage point for Sawmill Gulch (CCSTA) and Sheephouse Creek (CCSTA) where the NTMP proposes higher basal area retention than required and will follow the relevant additional CCSTA restrictions (921.3(a)(2)) to maintain the scenic value of these areas. This rule requires leaving at least 50%, by number, of trees over 12 inches d.b.h. This part of the river is relatively far from accessible boat launches and boat rental areas, which typically results in less river traffic than other more accessible parts of the Russian River. The Willow Creek Environmental Campground has restrictions on driving to the campground (packing in and out all equipment is required), recommends against swimming in the river, and does not allow dogs. This suggests more limited use of river recreation at this site. The vantage point for both areas would be from below the project area elevation, while either boating or standing, and will be obscured vegetation buffers along Highway 116.*

*Red Hill within Sonoma Coast State Park is another area which has visibility of the NTMP area, although it is almost three miles to the southernmost tip of the NTMP. Given the distance to the NTMP area, the additional harvest restrictions in place because of the CCSTA, and that the trail is moderately trafficked and is recommended for wildflowers and views of the Pacific Ocean and the river mouth, it is not anticipated that this project will impact the visual resources from Red Hill.*

Being the rural nature of the area, few if any homes have views of the NTMP area. The silvicultural system selected for this NTMP will leave vegetation cover upon completion of operations.

#### Past Projects

*Historic timber harvesting in this area impacted visual resources by removing all of the large trees.*

*Grazing was conducted. The visual impact would depend on the number of animals and if grazing resulted in bare soil.*

*Development was very sparse and would not have significantly impacted visual quality.*

#### Current and Ongoing Projects

*Timber Harvesting and grazing at low intensity is ongoing. No known development is occurring.*

*Recreation is ongoing at Willow Creek Environmental Campground and Red Hill within Sonoma Coast State Park.*

*A subdivision in Jenner with a small area overlooking Jenner Gulch is not currently being developed. A property owner who received the domestic water inquiry stated that they were unable to develop their parcel because the county has a moratorium on residential development for that area. That account has not been confirmed.*

*The silvicultural system for this NTMP, single tree selection and special treatment area, will retain tree and other vegetation cover upon completion of operations and would almost certainly be largely unnoticeable at distances. Areas with views of Sawmill Gulch (CCSTA) and Sheephouse Creek (CCSTA) where basal area retention is higher than selection silviculture requires, will be more unnoticeable. This part of the river is relatively far from accessible boat launches and boat rental areas, which typically results in less river traffic than other more accessible parts of the Russian River.*

#### Future Projects

*Berry's Knotfarm NTMP:*

*The NTMP is not expected to increase timber harvest levels. THPs and exemptions have facilitated multiple harvests on the NTMP property. Single tree selection silviculture and in particular, the high basal area retention in the STA stands that are visible from Sonoma Coast State Park and Highway 116, will retain enough trees that the horizontal view of the postharvest stand is indiscernible from the preharvest stand.*

#### Impacts Evaluation

*This NTMP in combination with the impacts of past, current, and future projects will not have a reasonable potential to cause or add significant cumulative impacts to the visual resources in the assessment area.*

### **F. VEHICULAR TRAFFIC IMPACTS**

The traffic assessment area involves the first roads not part of the logging area on which logging traffic must travel. For this plan, the assessment areas for traffic are the public roads on which log trucks would travel from the NTMP area to other destinations. *These roads include the driveway from the NTMP to Highway 116, California State Route 116 (Hwy 116), and California State Route 1 (Hwy 1). From these roadways, log trucks will travel to the Mill.*

*Truck traffic routes will vary depending on tree species hauled and the purchaser of logs sold except that the driveway to Highway 116 is the only possible route. Possible transportation routes of logs include Highway 116 (River Road) to U.S. Route 101 or Highway 116 (River Road) to California State Route 1.*

These Highways are in good condition. Maintenance appears to be commensurate with use and need which includes many years of log truck traffic.

Past Projects

*Past activities within the assessment area that would contribute to traffic effects and maintenance issues for these roads, aside from residential traffic are tourism, log hauling, heavy equipment, trailer hauling for ranching activities. Lumber hauling occurred in the past when the sawmills were operating.*

Current and Ongoing Projects

*Public road use is similar to past use involving the same activities.*

Future Projects

*Future projects within the assessment area will likely maintain the level of traffic effects and condition of the roads like the past and current projects although visitor traffic may increase. Future projects from the landowner are expected to occur every one to two years.*

This NTMP: Considering the size of the plan area and historic harvest frequency, harvests could occur every year or every two years. The estimated maximum number of log truck loads from any one sale is approximately 200 loads but smaller operations could have 50 loads. Assuming an NTO area requires approximately 10 weeks to harvest, this equates to an average of approximately five trucks per day, or three trucks per day for the long-term average, for approximately 10 weeks, once approximately every other year. This level of vehicular traffic impact is similar to historic levels. The amount of log truck traffic will not change. The only change is from CEQA compliance being met with Timber Harvest Plans and forest practice rule Exemptions to utilizing a Nonindustrial Timber Management Plan.

Impacts Evaluation

The proposed project, as presented, in combination with the impacts of past and future projects *in the assessment area*, will not add significantly to cumulative traffic impacts.

## **G. GREENHOUSE GASES/CLIMATE CHANGE**

### **H. Greenhouse Gases**

The assessment area for climate effects is the NTMP area and the public transportation routes for delivery of logs. The analysis is based on the carbon dioxide (CO<sub>2</sub>) emission and sequestration rates from timber operations.

There are 16.6 million acres of productive public and private timberland (statutorily available for harvest) in California (California Department of Forestry 2017). The NTMP includes 1,099 acres in Sonoma County, California. This represents 0.000066% of the total timberland, and 0.00084% of the 7.3 million acres of private timberlands in the state.

Since 1990, the State of California's benchmark for achieving GHG reductions, the forest products industry has implemented a significant reduction in harvest levels and the number of sawmills operating in the state. Since recordkeeping started in 1978, timber harvest peaked in 1988 at 4,670 million board feet and has continued to decline. In 1997, California harvested 2,400 million board feet, and by 2007 the harvest level had dropped to 1,626 million board feet, and the 2023 harvest was 1,453 million board feet (SBE Harvest Tables). This represents a reduction in harvest levels of 39 percent over the twenty-seven-year period. During the same timeframe, timber growth has continued to exceed harvest and tree mortality in California. On forest industry timberlands, growth exceeded harvest and mortality by approximately 22 ft<sup>3</sup>/acre/year over the re-measurement period (2001–2006 to 2011–2016). On nonindustrial timberlands, growth exceeded harvest and mortality by approximately 85 ft<sup>3</sup>/acre/year over the re-measurement period (2001–2006 to 2011–2016). On Forest Service timberlands, growth exceeded harvest and mortality by an average of over 33 ft<sup>3</sup>/acre/year over the re-measurement period (2001–2006 to 2011–2016). Not all of the nonindustrial and Forest Service timberlands are harvested. Even so, these statistics demonstrate that growth has exceeded the combination of harvest and mortality (CAL FIRE, 2017).

During the last two decades, there has also been a reduction in sawmills. In 1990, there were 117 sawmills in California. As of 2015, there were 28 sawmills (CFA). There has been a steady significant decline in total acres harvested over the 1997–2015 period. Harvested acres in 2015 were about half of 1997 harvest acres (CAL FIRE 2017).

Since 1990, the reduction of timber harvest in California, combined with the reduced number of sawmills, indicates that the forestry sector has already experienced declining CO<sub>2</sub> emissions resulting from the harvest, transportation, and processing of timber. At the same time, a net increase of forest growth on a statewide and regional level is indicative that timberlands on a statewide level and a regional level are actively sequestering atmospheric carbon, thereby reducing GHG. These trends of declining CO<sub>2</sub> emissions and increasing carbon sequestration are also true for the landowner's timberlands.

#### Greenhouse Gas Baseline Conditions

The California Global Warming Solutions Act of 2006 (AB 32) is California's legislative effort aimed at reducing greenhouse gas (GHG) emissions. Pursuant to AB 32, California Air

Resources Board (CARB) must develop an implementation program and adopt control measures to achieve the maximum technologically feasible and cost effective GHG reductions. AB 32 requires CARB to prepare a Scoping Plan to achieve reductions in GHG emissions in California. In 2008, CARB staff presented the initial draft of the AB 32 Scoping Plan for Board review. The scoping plan first considered by the board in 2008 must be updated every five years, the Scoping plans have been updated in 2014, 2017 and 2022. Previous plans have focused on specific (GHG) reduction targets for industrial, energy, and transportation sectors-first to meet 1990 levels by 2020. The most recent update, 2022, sets a CO<sub>2</sub> capture and removal target of 20 million metric tons (MMT) by 2030 and 100 MMT by 2045.

This most recent update

- Identifies a path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030.
- Identifies a technologically feasible, cost-effective path to achieve carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels.
- Focuses on strategies for reducing California's dependency on petroleum to provide consumers with clean energy options that address climate change, improve air quality, and support economic growth and clean sector jobs.
- Integrates equity and protecting California's most impacted communities as driving principles throughout the document.
- Incorporates the contribution of natural and working lands (NWL) to the state's GHG emissions, as well as their role in achieving carbon neutrality.
- Relies on the most up-to-date science, including the need to deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration, as well as direct air capture.
- Evaluates the substantial health and economic benefits of taking action.
- Identifies key implementation actions to ensure success.

This Scoping Plan includes modeling and quantification of GHG emissions and carbon sequestration in natural and working lands (NWL). To date, the focus has been only on reducing the emissions of GHGs from our transportation, energy, and industrial sectors. The state's 2020 and 2030 GHG reductions targets only include these sources, as they are the primary drivers of climate change and disproportionate harmful air pollution in our vulnerable communities. This Scoping Plan, through the lens of carbon neutrality, expands the scope to more meaningfully consider how our NWL contributes to our long-term climate goals. For the first time, new and cutting-edge modeling tools allow us to estimate the quantitative ability of our forests and other landscapes to remove and store carbon under different scenarios. These cutting-edge tools were developed through a stakeholder process and in coordination with other agencies for the purpose of this update and will continue to be refined over time and made available to others seeking to do similar work.

As recent data and Scoping Plan modeling shows, California's NWL also can act as a source of emissions, principally in the form of wildfires. California's forests are experiencing a deadly combination of drought and heat combined with a century of misguided fire suppression

management. Scoping Plan modeling shows that, at this time and until our forests reach a balance through appropriate treatments, California's NWL will act as a net source of emissions, not a sink. As such, the Scoping Plan includes policy direction and actions intended to quickly move the sector toward being a net sink and a more natural state, where wildfires will continue to be an important part of the healthy forest cycle but not at the intensity and frequency observed in recent years (2022 Scoping Plan Update).

The Forest Carbon Plan provides guidance and input to the Natural and Working Lands Implementation Plan described in California's 2017 Climate Change Scoping Plan. The Forest Carbon Plan describes a significant deficit in forest management in California, both on private lands and nonfederal public forestlands. To address the forest health and resiliency needs on a statewide basis on nonfederal lands, the plan states forest treatments need to increase to 500,000 acres per year to make an ecologically significant difference at the landscape scale.

The plan further describes the treatments to include those that generate revenue from harvest materials, such as commercial thinning and regeneration harvests. This plan, together with 848 other NTMPs approved in the state from 1991 through 2019 covering 371,823 acres (CALFIRE 2020) make a significant contribution towards achieving the statewide goal of managing an increasing number of acres to improve forest health and resiliency.

#### Past and Future Projects

During the last two decades, there has also been a reduction in sawmills. In 1990, there were 117 sawmills in California. As of 2015, there were 28 sawmills (CFA). There has been a steady significant decline in total acres harvested over the 1997–2015 period. Harvested acres in 2015 were about half of 1997 harvest acres (CAL FIRE 2017).

Forestlands are, in general, a carbon sink where CO<sub>2</sub> is captured and fixed by the process of photosynthesis, which removes carbon from the atmosphere and sequesters carbon in wood fiber (OFRI 2024, U.S.E.P.A. 2005). In California, forests in the North Coast, Cascade Northeast and North Sierra regions were estimated to produce a net benefit of 7.2 million metric tons of CO<sub>2</sub> equivalents removed from the atmosphere each year (California Energy Commission 2004). Growing forests sequester and store more carbon over time until growth stagnates as trees reach a mature age. Older trees sequester carbon through new growth at a declining rate, but they remain pools of stored carbon until they decay through decline, death, or consumptive use.

Under a static view of carbon sequestration in forest management, there is a misconception that more carbon is sequestered by growing older trees rather than repeated cycles of tree growth under an intensive forest management regime. Under this static view, a stand of trees will sequester and store more carbon if it is allowed to grow old in comparison to harvest at a younger age. While this is true in a static comparison of a stand at two different ages, it ignores the dynamic of carbon sequestration through a combination of intensive forest growth and wood products made from harvested timber. Carbon sequestration requires a dynamic view that measures carbon sequestration and storage over time. A dynamic view of carbon sequestration demonstrates that managed commercial forests, such as this NTMP, are more effective in sequestering carbon and mitigating GHG.

Managed commercial forests made a significant contribution to the sequestration of carbon and mitigation of GHG (IPCC 2021, Mader 2007, OFRI 2006, U.S.E.P.A. 2005). Several studies have documented a positive net effect of carbon sequestration by commercial timberlands where forests are grown, harvested, and processed into wood products (James et al. 2007; Perez-Garcia et al. 2005; Lippke et al. 2004). Even when CO<sub>2</sub> emissions from timberland management, timber harvest, and forest product uses are considered, the long-term, sustainable and intensive management of commercial timberlands to produce wood products generates a net carbon sequestration benefit that mitigates GHG. These studies investigated timber harvest at various rotation ages relative to no harvest and perpetual old growth stands. They found that intensive forest management with a rotation of 50 years or less can produce net positive carbon sequestration benefits because carbon is sequestered through repeated cycles of tree growth while a substantial percentage of harvested and milled wood is sequestered for decades or centuries in buildings. Life cycle assessment studies have shown that wood products have a much smaller “carbon footprint” compared to other building materials. Not only is carbon sequestered by trees, but it may be stored for long periods of time in wood products. It is estimated that at the end of 100 years, a weighted average of 47 percent of the solid wood products manufactured from the log are still in use, and if the wood in stable storage in a landfill is included, that weighted average over the 100-year period is 76% (U.S. Dept. of Energy – 1506(b) Tables).

The net sequestration benefits of an intensively managed forest are further enhanced by the effects of substitution. When wood products are used for building materials in lieu of concrete or steel, CO<sub>2</sub> emissions are reduced because there is less demand for steel and concrete, which are manufactured with large CO<sub>2</sub> emissions as a byproduct (IPCC 2021; Mader 2007; OFRI 2006; Perez-Garcia et al. 2005; Lippke et al. 2004). Further, to the extent that harvested wood is not incorporated into fixed building components, wood residues may be used as fuel for energy production in lieu of fossil fuels. When wood residues are used in this way, there is no increase in CO<sub>2</sub> emissions from their combustion because the same emissions will result from the oxidation and decay of wood residue. However, more significant CO<sub>2</sub> emissions from the burning of fossil fuels, such as coal or oil, can be avoided when wood residue is burned to create heat and generate electricity.

This NTMP is a future timber harvest project that will produce substantial net carbon sequestration benefits over time. The landowner's timberlands are planned to be sustainably managed in accordance with California law such that the harvest of timber through future projects will not exceed the long-term tree growth of the timberlands.

The cumulative beneficial effects of the NTMP are expected to sustain the timber production land use and reduce the risk of wildfire, which are, in turn, beneficial impacts on GHG emissions and carbon sequestration. Land use conversion from forestry to other uses has a negative impact on GHG (OFRI 2006). In addition, catastrophic wildfires are enormous emitters of CO<sub>2</sub>. Both of these adverse impacts to GHG are prevented or reduced when the landowner succeeds in management of forestland for timber production.

Following each timber harvest, the landowner will manage slash to reduce fire risk and enhance

forest soils that will host the next cycle of forest growth. Redwood and hardwood stumps will have coppice regeneration of sprouts and immediately begin to fix carbon through photosynthesis. There is a strong incentive to protect growing tree stands from mortality that adds to forest fuels and to suggestively prevent and suppress wildfires before they become catastrophic. This NTMP has the cumulative benefit of reducing the risk of catastrophic fire and related adverse impacts to GHG and carbon sequestration.

This NTMP will also result in minimal impacts to the carbon stored in the duff layer and the soil. Because the harvesting conducted will minimize duff and soil disturbance, and there will not be broadcast burning, carbon stored in the duff layer is essentially intact following harvesting. The NTMP will also retain downed woody material for wildlife benefits. A recent soil carbon study shows that soil carbon increases for the first 10 to 20 years following harvest (McFarlane, et. al in review). This study found: "Whole-soil C and N concentrations increased with site quality (Table 2) and showed slight gains from original values at plantation establishment (Table 1). Concentration gains in whole-soil C and N averaged 19 percent and 10 percent, respectively." Regardless of the benefits that the project and similar past, present, and future projects will have on diminishing GHG emissions and promoting carbon sequestration, climate change is likely to occur. The rate and direction of climate change remains uncertain (IPCC 2017). There is no way to reliably predict the rate and direction of climate change or the regional or localized effects on temperatures, precipitation, growing seasons, drought, vegetation, and wildlife (IPCC 2017). For our purposes, we assume that temperatures on the California coast are likely to increase, on average.

#### Berry's Knotfarm NTMP:

The project is a Non-Industrial Timber Management Plan (NTMP). The NTMP will result directly and indirectly in carbon sequestration and temporary, insignificant CO<sub>2</sub> emissions. Carbon sequestration is achieved through a combination of methods. The NTMP includes a selection harvest of trees that remove CO<sub>2</sub> from the atmosphere and growing of trees that store carbon in tree fiber. Harvests utilizing single tree selection also sequester carbon in harvested trees, and foster growth of new trees that remove CO<sub>2</sub> during their lifespan. When a tree is harvested, most of the carbon is sequestered in wood products, while new trees grow in the forest and begin a new cycle of carbon sequestration. To the extent these wood building products replace the demand for new concrete or steel building components; they reduce substantial CO<sub>2</sub> emissions that are associated with the manufacture of cement and steel.

Leftover material, such as slash, is left to decay and will emit CO<sub>2</sub> over time. Slash supplements the forest soils and forest duff layer where carbon is stored and serves as a substrate and nutrients for increased tree growth. Redwood is a dominant species on the plan area, and redwood slash decays more slowly than slash from hardwood and whitewood species. When CO<sub>2</sub> is released by decaying slash, it is offset by rapid regeneration of tree stands (including sprouts from redwood and hardwood species) and other vegetation that sequester carbon. Some of the carbon-filled tree fibers, such as bark, saw dust, and chips, are by-products of converting a tree to lumber, and they are used in other engineered building products or may be used as fuel used to generate electricity or steam to dry lumber. When bark, saw dust, and wood chips are burned to generate electricity or steam, there are CO<sub>2</sub> emissions that would also occur if the bark and chips were allowed to

simply decay. These emissions are offset by the reduction of CO<sub>2</sub> emissions that occur when wood fuel is substituted for the combustion of fossil fuels, such as coal and oil, which generate CO<sub>2</sub> emissions in more substantial quantities.

Applying the draft threshold discussed above, the NTMP would have a less than significant impact on the environment, because the forestry practices do not implement a land use change and they increase carbon storage over time, consistent with GHG goals for California's forestry sector.

Carbon emissions and sequestration for the NTMP were estimated using the Greenhouse Emissions Calculator developed by CAL FIRE for use in NTMP CEQA impact analysis. The input data and calculator worksheets can be found in Section V.

Direct GHG emissions from the NTMP over a 100-year period are result from equipment emissions related to the logging, site preparation, hauling, and milling. These emissions are small relative to other agricultural CO<sub>2</sub> emissions. Biofuel substituted for petroleum would lower emissions although, the reduction would be considered small relative to sequestration in growth, storage in wood products, and emissions from waste wood decomposition (U.S.E.P.A. 2005). An acre of managed forest is entered infrequently, with emissions measured in hours of equipment operation during harvest entries. Few, if any, other land uses can match the low intensity of CO<sub>2</sub> emissions over space and time that is associated with commercial forestry. In urban areas of California, a typical California household will operate one or more vehicles every day for 50 years, and the demands of that household will induce a variety of additional CO<sub>2</sub> emissions for other forms of commerce, power production, and consumption. In rural areas, even a typical farm acre in California will be subject to equipment operation for several hours or days every year, much greater than the intensity of forestry management.

GHG emission effects of the NTMP are diminished by the offsetting effects of carbon sequestered in the wood products produced from harvest and by the sustainable management proposed in this NTMP. It has been conservatively estimated that on a weighted average, 47 percent of the carbon in timber will remain sequestered in wood building components for approximately 100 years. If products stored in landfills are also included, the weighted average increases to 76%. The 100-year permanency period is the same as that used by the California Climate Action Registry for its analysis of a permanent carbon offsets. Net emissions for this period for implementation of this NTMP is estimated to be 9.33 metric tonnes of CO<sub>2</sub> per acre.

Carbon sequestration under this NTMP is demonstrated in the accounting of carbon sequestered in wood products and forest growth compared to emissions from timber harvest and hauling equipment, burning or decay of slash byproducts of timber harvest, and burning or decay of lumber products and byproducts that do not persist for 100 years. Even when it is conservatively assumed that (1) carbon in timber slash is immediately emitted at harvest (although it actually decays over time, some of which becomes carbon stored in soil and other plants, and is sometimes burned as a substitute for fossil fuels); and (2) 53 percent of the carbon in each log is released to the atmosphere (when, in truth, a substantial portion of the log fuel and wood chip byproducts of manufacturing are used in engineered wood products or as a substitute for fossil fuels), the carbon sequestered in long-lasting wood products and in new and continuing forest growth results in a net increase in sequestered carbon that fully mitigates the GHG emissions

from harvesting. We conservatively estimate that NTMP activities result in the sequestration of 9,991 metric tons CO<sub>2</sub> over 100 years. This estimate is likely to be low because it assumes that all slash and lumber manufacturing byproducts are immediately released as CO<sub>2</sub>, and it excludes all fossil fuel substitution benefits derived from the potential use of wood waste as a fuel used to generate steam and electricity.

The estimate of net carbon sequestration is based on the long-term management plan for the landowner's timberlands as computed in the CAL FIRE Greenhouse Gas Emissions Calculator. The NTMP provides a conservative view of net carbon sequestration because the landowner may harvest less timber or defer timber harvest within the scope of the plan as a response to market conditions or for other reasons. The activities described in the management plan are the basis for the estimated net carbon sequestration. Because the GHG emissions from the NTMP are less than carbon sequestration, the this project is consistent with the CO<sub>2</sub> removal and carbon capture goals of the AB 32 Scoping Plan, updated by CARB, 2022.

In the face of uncertainty, the impacts of climate change must be assessed in terms of the resilience of the landowner's timberlands should climate changes occur. There are several indications that the timberlands have been and continue to be resilient. After more than a century of timber harvesting, most of which occurred without the benefits of modern forest practices regulations and best management practices, the timberlands remain among the most productive forest lands in the world. A key tree species of California timberlands is the coast redwood (*sequoia sempervirens*). The redwood tree is not expected to be threatened by pests that might be advantaged by global warming, and it is expected to persist in the southern end of its range even if climate change brings higher temperatures and less precipitation (Battle 2006). The landowner's timberlands are within the middle of the redwood range. The redwood tree also benefits from coppice regeneration, which allows it to regenerate from the stump after a tree has been harvested. As such, much of the living root system of redwood trees persists, and the genetic diversity of each individual tree is preserved on the landscape as cut trees are replaced by genetically identical sprouts that grow from the same root system. For the same reason, the regeneration and growth of redwood forests after harvest occurs quickly and with more certainty because young trees have the benefit of mature root systems. The resilience of these lasting forests is also supplemented by planting of seedlings to promote genetic diversity and healthy stocking levels.

Douglas-fir grows in a variety of climates throughout western North America and are believed to have rapidly colonized areas that are now vast forestlands following the end of the last Ice Age. The landowner has a strong incentive to nurture healthy and resilient forest stands on the property.

This plan, together with 846 other active NTMPs approved in the state from 1991 through 2023 covering 335,471 acres (CNRA, CalEPA) make a significant contribution towards achieving the statewide goal of managing an increasing number of acres to improve forest health and resiliency.

### Impacts Analysis

Based on a quantitative carbon cumulative impacts assessment, the NTMP in combination with

past, present, and reasonably foreseeable future projects, will not cause or add to significant cumulative impacts related to climate change. This project will sequester carbon through the creation of wood products. Emissions created from project operations will be sequestered as trees regenerate. Carbon stocks are projected to be recouped 88 years after initial harvest.

## I. WILDFIRE RISK & HAZARD

**Fire hazard severity zoning:** California law requires Cal Fire to identify areas based on the severity of fire hazard that is expected to occur there. According to the Fire Hazard Severity Zone Viewer effective April, 2024, the plan area is located in **High and Moderate Severity Zones**. The location of these severity zones was found on CAL FIRE's Fire Hazard Severity Zone website.

Pursuant to California Public Resource Code (4125-4137), the Board of Forestry is tasked with classifying all lands within the state for the purpose of determining the financial responsibility for wildfire protection and suppression. Wildfire hazard responsibility areas are generally classified as state, local or federal. This plan area is located within the **State Responsibility Area (SRA)** for fire protection.

**Existing and probable future fuel conditions including vertical and horizontal continuity of live and dead fuels:** *Vertical continuity is flammable fuel that connects understory fuel to the tree canopy. Horizontal continuity refers to how spatially connected fuels are. Timber operations can separate connected fuel vertically and horizontally. Timber operations result in logging slash which increases ground fuel. Thinning trees decreases horizontal fuel connectivity by increasing tree spacing. Limbs on retained trees along with brush are inadvertently knocked to the ground decreasing continuity. Opening of brushed over skid trails, landings, and haul roads reduces the fuel connectivity of fuels. The plan provides for the piling and burning of slash as hazard reduction at landings. Slash treatment in the STA and pile burning are addressed in Section II, Items 30 and 38. There are no communities or structures within the Fire Hazard Assessment Area.*

*The forest stands of this NTMP have moderate fuel loads and moderate fuel continuity. The highest fuel continuity is in Units 1 and 2 as they have been unmanaged for a longer time period than the other units. The area of Unit 2 recently logged under an exemption was thinned from below reducing continuity and retaining the most fire resistant trees. Units 3, 4, and 5 are more open with greater tree spacing and fewer connected canopies. Understory vegetation is generally at low levels in all units. Walking through, off trail, is relatively easy with regards to impeding brush. A portion of Unit 5 appears to contain an SOD infestation and was partially burned in a wildfire. This area should be treated with lopping, piling and burning, and or mastication. Most of the fuel in all five units consists of native vegetation. Overstory tree crown connectivity is the highest type of fuel continuity in the assessment area.*

Licensed Timber Operators are required to maintain a sealed box of tools, as required by PRC § 4428(a), within the operating area containing: 1 backpack pump-type fire extinguisher filled with water; two axes; two McLeod Fire tools; a "spade point" shovel with an overall length of at least 46" for each employee; and at least one serviceable chainsaw with a minimum 20" cutting bar. These firefighting tools allow operators to immediately respond to any fire caused by timber operations.

## **Locations of Known existing public and private Fuelbreaks and fuel hazard reduction activities.**

*Coast Ridge Community Forests is planning to create a fuel break that would include part of the NTMP area. No other details are known including the exact location.*

*Timber harvesting on the NTMP property maintains and reuses skid trails and truck roads which are fuel breaks as they are not vegetated and provide fire suppression access. Fuel hazard reduction and slash treatment, where the qualified location exists, is addressed in Section II of the plan. During logging operations there is generally equipment on site that would be suitable for the construction of firelines or to support fire department crew suppression activities.*

### Past Projects

*Fire exclusion policies and philosophies contributed to increasing fuel loads. Suburban encroachment has increased wildfire risk and hazard by increasing the amount of people in the wildland urban interface (WUI). The Walbridge and Meyers fires of 2020 occurred north of the NTMP area, showing high wildfire potential in western Sonoma County.*

*Outside of the assessment area, the Jenner Headlands Preserve established a 220-acre shaded fuel break along the East and West Ridges between 2013 and 2019. A Notice of Exemption (NOE) for Fuels Reduction and Vegetation Management on the Jenner Headlands Preserve was recorded by CEQAnet in 2021. This NOE proposed fuel load maintenance on 134 acres of previously established shaded fuel break. A 1.6-acre prescribed burn was completed by CAL FIRE in 2024 on the East Ridge of the Jenner Headlands Preserve.*

### Current and Ongoing Projects

*Road access for fire suppression resources:*

*Road access is through a gated driveway on neighboring properties. From there, ranch roads are open to provide access around the ranch. The driveway is located 2.2 miles east along Highway 116 from Jenner and 2.7 miles west along Highway 116 from Duncan's Mills. If a fire occurs during a declared fire season, Cal Fire is responsible for providing primary support and is maintained by a fire station located 1.5 miles south of Cazadero. If a fire occurs outside of a declared fire season, the volunteer fire departments located within the towns of Duncan's Mills and Jenner are the primary fire suppression support.*

*Outside of the assessment area, Sonoma Coast State Park has reported three fuel reduction projects since 2023. A 90.5-acre broadcast burn treatment was completed in 2023 as part of the Sonoma Coast State Park project. This project occurred in two areas, one near Bridgehaven and the other along the south side of Willow Creek Road (CAL FIRE, 2025). Two prescribed burns were completed between September 2024 and January 2025 by California State Parks on the Sonoma Coast State Park (CARB). In 2024 a 38-acre underburn was completed near the Russian River, and in 2025 a 13-acre underburn was completed near Red Hill Vista Trail.*

*Berry's Knotfarm burns slash piles regularly to remove the hazardous fuel.*

### Future Projects

*Logging and slash treatment will decrease vertical and horizontal fuels in harvest areas. Slash generated from timber operations begins to noticeably break down and deteriorate within 5 to 10 years along the coast range. Roads used in the NTMP will be maintained and upgraded and could provide access to the property in case of emergency. Wildfire risk in the western United States is predicted to increase, further necessitating fuel reduction and fuel break establishment. The proximity of this NTMP to the coast may decrease the risk of wildfire due to coastal weather conditions.*

*Berry's Knotfarm NTMP:*

*Roads used in the NTMP will limit potential fire spread by reducing fuel continuity. These roads also increase ingress and egress. Slash created by operations shall not be excessively piled against trees, in excessive height, or causing higher fire risk. To further mitigate the risk of fire ignition during timber operations, the Licensed Timber Operator is required to maintain a sealed box of firefighting tools to allow operators to immediately respond to any fire caused by timber operations.*

**Impact Evaluation:** The potential for significant forest fuel loading will not be created within the plan area. Slash generated from timber operations often breaks down and deteriorates within 5 to 10 years along the coast range. The proposed project is not anticipated to cumulatively add to an increase in wildfire risk or hazard in the area. By implementation of operations within the plan area, the overall fire hazard potential is expected to decrease.

## **J. OTHER**

### **Noise**

The assessment area for noise is the area within ¼-mile (surrounding area) of the project area. This is the area that will be most affected by noise impacts generated from the project.

The following generally describes various noise levels associated with forests, rural residences, timber operations equipment, and other noise generating sources.

The Natural Ambient (Generally < 50 dB) noise level of the area are not substantially influenced by human activities and includes sources native to forest habitats and some human-generated white-noise such as a distant highway.

Very Low (Typically 50-60 dB) noise levels are generally limited to circumstances where human generated sound would not include amplified or motorized sources of noise. Includes forest habitats close to less frequently encountered natural sources, such as rapids along large streams, wind-exposure, and may include quiet human activities such as nature trails and walk-in picnic areas.

Low (Typically 61-70 dB) noise levels are generally characterized by the sound of light vehicular traffic at slow speeds on paved surfaces, residential activities, and non-gas powered recreational activities. These are noises typically associated with current rural residential uses associated with the plan area and surrounding area.

past, present, and reasonably foreseeable future projects, will not cause or add to significant cumulative impacts related to climate change. This project will sequester carbon through the creation of wood products. Emissions created from project operations will be sequestered as trees regenerate. Carbon stocks are projected to be recouped 88 years after initial harvest.

## I. WILDFIRE RISK & HAZARD

**Fire hazard severity zoning:** California law requires Cal Fire to identify areas based on the severity of fire hazard that is expected to occur there. According to the Fire Hazard Severity Zone Viewer effective April, 2024, the plan area is located in **High and Moderate Severity Zones**. The location of these severity zones was found on CAL FIRE's Fire Hazard Severity Zone website.

Pursuant to California Public Resource Code (4125-4137), the Board of Forestry is tasked with classifying all lands within the state for the purpose of determining the financial responsibility for wildfire protection and suppression. Wildfire hazard responsibility areas are generally classified as state, local or federal. This plan area is located within the **State Responsibility Area (SRA)** for fire protection.

**Existing and probable future fuel conditions including vertical and horizontal continuity of live and dead fuels:** Vertical fuels are materials that connect the forest floor to the canopy, horizontal fuels refers to how spatially connected fuels are within a landscape. Prior to operation the current conditions have a higher connectivity vertically and horizontally creating a higher risk of fire to carry across the landscape or potentially into the canopy creating a crown fire.

While timber operations can lead to an accumulation of logging slash, the removal of trees in an overly crowded stand will decrease a stand's vertical and horizontal fuel connectivity. Opening of brushed over skid trails and landings, as well as fuels reduction on haul routes reduces the connectivity of fuels and decreases the potential of the spread of fire. Averaged across all acres of the plan area, significant slash accumulation is not anticipated. Landing sites are prone to slash buildup and piles can be significant, however the plan provides for the piling and burning of slash as hazard reduction at landings. Slash treatments and hazard zones are addressed in Section II of the plan.

Licensed Timber Operators are required to maintain a sealed box of tools, as required by PRC § 4428(a), within the operating area containing: 1 backpack pump-type fire extinguisher filled with water; two axes; two McLeod Fire tools; a "spade point" shovel with an overall length of at least 46" for each employee; and at least one serviceable chainsaw with a minimum 20" cutting bar. These firefighting tools allow operators to immediately respond to any fire caused by timber operations.

### **Locations of Known existing public and private Fuelbreaks and fuel hazard reductions activities.**

*There are no communities or structures within the Fire Hazard Assessment Area.*

*Coast Ridge Community Forests is planning to create a fuel break that would include part of the NTMP area. No other details are known including the exact location.*

*Timber harvesting on the NTMP property maintains and reuses skid trails and truck roads which are fuel breaks as they are not vegetated and provide fire suppression access. Slash treatment, in the STA, is addressed in Section II of the plan. During logging operations equipment suitable for the construction of firelines or to support fire department crew suppression activities is available.*

### Past Projects

*Fire exclusion policies and philosophies contributed to increasing fuel loads. Suburban encroachment has increased wildfire risk and hazard by increasing the amount of people in the wildland urban interface (WUI). The Walbridge and Meyers fires of 2020 occurred north of the NTMP area, showing high wildfire potential in western Sonoma County.*

*Outside of the assessment area, the Jenner Headlands Preserve established a 220-acre shaded fuel break along the East and West Ridges between 2013 and 2019. A Notice of Exemption (NOE) for Fuels Reduction and Vegetation Management on the Jenner Headlands Preserve was recorded by CEQAnet in 2021. This NOE proposed fuel load maintenance on 134 acres of previously established shaded fuel break. A 1.6-acre prescribed burn was completed by CAL FIRE in 2024 on the East Ridge of the Jenner Headlands Preserve.*

### Current and Ongoing Projects

*Road access for fire suppression resources:*

*Road access is through a gated driveway on neighboring properties. From there, ranch roads are open to provide access around the ranch. The driveway is located 2.2 miles east along Highway 116 from Jenner and 2.7 miles west along Highway 116 from Duncan's Mills. If a fire occurs during a declared fire season, Cal Fire is responsible for providing primary support and is maintained by a fire station located 1.5 miles south of Cazadero. If a fire occurs outside of a declared fire season, the volunteer fire departments located within the towns of Duncan's Mills and Jenner are the primary fire suppression support.*

*Outside of the assessment area, Sonoma Coast State Park has reported three fuel reduction projects since 2023. A 90.5-acre broadcast burn treatment was completed in 2023 as part of the Sonoma Coast State Park project. This project occurred in two areas, one near Bridgehaven and the other along the south side of Willow Creek Road (CAL FIRE, 2025). Two prescribed burns were completed between September 2024 and January 2025 by California State Parks on the Sonoma Coast State Park (CARB). In 2024 a 38-acre underburn was completed near the Russian River, and in 2025 a 13-acre underburn was completed near Red Hill Vista Trail.*

*Berry's Knotfarm burns slash piles regularly to remove the hazardous fuel.*

### Future Projects

*Logging and slash treatment will decrease vertical and horizontal fuels in harvest areas. Slash generated from timber operations begins to noticeably break down and deteriorate within 5 to 10 years along the coast range. Roads used in the NTMP will be maintained and upgraded and could provide access to the property in case of emergency. Wildfire risk in the western United States is predicted to increase, further necessitating fuel reduction and fuel break establishment. The proximity of this NTMP to the coast may decrease the risk of wildfire due to coastal weather conditions.*

*Berry's Knotfarm NTMP:*

*Roads used in the NTMP will limit potential fire spread by reducing fuel continuity. These roads also increase ingress and egress. Slash created by operations shall not be excessively piled against trees, in excessive height, or causing higher fire risk. To further mitigate the risk of fire ignition during timber operations, the Licensed Timber Operator is required to maintain a sealed box of tools within the operating area containing: one backpack pump-type fire extinguisher filled with water; two axes; two McLeod fire tools; a "spade point" shovel with an overall length of at least 46" for each employee; and at least one serviceable chainsaw with a minimum 20" cutting bar. These firefighting tools allow operators to immediately respond to any fire caused by timber operations.*

**Impact Evaluation:** The potential for significant forest fuel loading will not be created within the plan area. Slash generated from timber operations often breaks down and deteriorates within 5 to 10 years along the coast range. The proposed project is not anticipated to cumulatively add to an increase in wildfire risk or hazard in the area. By implementation of operations within the plan area, the overall fire hazard potential is expected to decrease.

## **J. OTHER**

### **Noise**

The assessment area for noise is the area within ¼-mile (surrounding area) of the project area. This is the area that will be most affected by noise impacts generated from the project.

The following generally describes various noise levels associated with forests, rural residences, timber operations equipment, and other noise generating sources.

The Natural Ambient (Generally < 50 dB) noise level of the area are not substantially influenced by human activities and includes sources native to forest habitats and some human-generated white-noise such as a distant highway.

Very Low (Typically 50-60 dB) noise levels are generally limited to circumstances where human generated sound would not include amplified or motorized sources of noise. Includes forest habitats close to less frequently encountered natural sources, such as rapids along large streams, wind-exposure, and may include quiet human activities such as nature trails and walk-in picnic areas.

Low (Typically 61-70 dB) noise levels are generally characterized by the sound of light vehicular traffic at slow speeds on paved surfaces, residential activities, and non-gas powered recreational activities. These are noises typically associated with current rural residential uses associated with the plan area and surrounding area.

Moderate (Typically 71-80 dB) noise levels are generally characterized by passenger vehicles and street-legal motorcycles, small gas-powered engines, small chain saws, electric hand tools, and high-tension power lines. These are noises typically associated with current rural residential uses associated with the plan area and surrounding area.

High (Typically 81-90 dB) noise levels generally include medium and large-sized construction equipment, such as backhoes, front end loaders, road graders, dozers, dump trucks, and other moderate large diesel engines, large chainsaws, and other large gasoline-powered tools. These are the noises typically associated with ground based logging equipment as would be anticipated during a timber harvesting event in the plan area.

Very High (Typically 91-100 dB) noise levels included impacting devices (jackhammers) compression ('jake') brakes on large trucks and trains, chipping machines, felling of large dominant and co-dominant trees, truck horns, yarding tower whistles, etc. These are noises typically associated with a timber harvesting event and cable logging equipment as would be anticipated during a timber harvesting event in the plan area.

Extreme (Typically 101-110 dB) generally include ground level unmuffled explosions, low-level overflights, hovering helicopters, and heavily amplified music, and Levels Exceeding 110 dB include jet engines, large sirens, open air explosions, and double rotor logging helicopters. These types of noises are not anticipated as a result of the proposed plan.

The timber harvesting activities are expected to be infrequent and of limited duration, generally occurring approximately every other year sometime between May and November. Noise generated from timber harvesting and related activities may include small and large chainsaws, felling of large trees, ATV's, bulldozers, cable yarder whistles, skidders, graders, water trucks, truck horns, chipping machines, service trucks, log trucks with large diesel and/or gasoline engines, various small to medium pneumatic or gasoline powered tools, service tools, etc. The use of these types of tools and equipment is expected to be conducted during normal operating hours. Noise generated from any potential future projects may include similar tools and equipment, as well as potential noise generated from residential activities. These types of equipment that will be used during the project are categorized into noise levels ranging from Low (Typically 61-70 dB) to Very High (Typically 91-100 dB). Noise generated from logging, yarding, loading, and truck traffic exiting the plan area and onto the first roads not associated with the plan area will contribute to elevated noise levels on the plan area and surrounding areas.

To analyze noise levels anticipated to be generated as a result of timber operations on the plan area from disturbing the surrounding area, the guidance provided by the U.S.F.W.S document "Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California" was used. Table G-1 uses reasonable median sound values within the above-described noise categories for both ambient and source sound conditions. The table reports the distances within which elevated, project-generated sound could be reasonably expected to exceed ambient conditions to such a degree as to result in disturbance to NSO and Marbled Murrelet, and for the proposed plan in the absence of such species, as a proxy for disturbance to humans in the surrounding area. The bolded values indicate the overlap between estimated existing noise levels and anticipated project generated sound levels.

Table G-1. Estimated disturbance distance in feet due to elevated project generated sound levels

Existing Pre-Project Sound Level (dB)	Anticipated Project-Generated Sound Level (dB)			
	Moderate (71-80)	<b>High</b> <b>(81-90)</b>	<b>Very High</b> <b>(91-100)</b>	Extreme (101-110)
Natural Ambient (<50)	165	500	1320	1320
Very Low (51-60)	0	330	825	1320
<b>Low</b> <b>(61-70)</b>	0	<b>165</b>	<b>825</b>	1320
<b>Moderate</b> <b>(71-80)</b>	0	<b>165</b>	<b>330</b>	1320
High (81-90)	0	165	165	500

Noise disturbance from timber operations would primarily be a disturbance to rural residential uses adjacent to the plan area. *There are at least three habitable structures located within one quarter of a mile of the plan area that may potentially be affected.*

Given the proposed frequency of timber operations on the plan area, short duration of timber operations during any year of activity, distance of the plan area from significant numbers of nearby habitable structures, the noise impacts from the proposed plan is considered to be low.

Past Projects and Activities

*Past timber operations created noise beyond historic baselines. In the 1800s, the construction and operation of a mill in Sawmill Gulch likely created elevated general sound levels. Logging operations in the area likely contributed to elevated general sound levels. By the 1900s the introduction of heavy machinery and other technologies likely increased sound levels.*

Current and Ongoing Projects

*Logging occurs on the NTMP property every few years generating sound above the ambient level. Roads are typically opened in spring with a tractor. Ranch activities such as chainsaw work for road maintenance and firewood collection are ongoing. Cattle grazing operations generate infrequent noise at low decibel levels. Traffic from Highway 116 generates noise but is constant and would be considered ambient.*

Future Projects

*Current and ongoing projects are expected to continue at similar rates and levels except that highway traffic may increase. Motorized tools, tractors, and vehicles are expected to produce lower decibel levels as a result of technological advancements.*

Berry's Knotfarm NTMP

*Anticipated project related sound associated with timber harvesting activities are expected to be infrequent and of limited duration, generally occurring approximately every other year sometime between May and November. Noise generated from timber harvesting and related activities may include small and large chainsaws, felling of large trees, ATV's, bulldozers, cable yarder whistles,*

*skidders, graders, water trucks, truck horns, chipping machines, service trucks, log trucks with large diesel and/or gasoline engines, various small to medium pneumatic or gasoline powered tools, and other service tools. The use of these types of tools and equipment is expected to be conducted during normal operating hours. Noise generated from logging, yarding, loading, and truck traffic exiting the plan area and onto the first roads not associated with the plan area will contribute to elevated noise levels on the plan area and surrounding areas.*

*The western boundary of the NTMP is near a subdivision on Balboa Ave. in Jenner. NTMP Unit 2 is the nearest unit to this subdivision. Unit 2 also has an unobstructed line of sound to the river beach of Sonoma Coast State Park. Sound from the NTMP to the Park camp area is somewhat obstructed and more than 2.5 miles away. Red Hill is approximately 2 miles from the NTMP. Operations of equipment and chainsaws in NTMP Unit 2 shall be limited to the hours of 7:00 AM to 7:00 PM.*

### Impacts Evaluation

The proposed project in combination with the impacts of past and future projects will not have a reasonable potential to cause or add significant impacts to the cumulative noise impacts in the assessment area.

### **Sudden Oak Death**

*The assessment area is downstream of the NTMP and within 1,000 feet of watercourses flowing from the NTMP. This area was selected because SOD spreads in water and most new infections from wind dispersal occur within 1,000 feet of infected trees.*

*Sudden Oak Death (*Phytophthora ramorum*) was first observed in coastal forests of California in the mid-1990s (Rizzo et al., 2005). Notable susceptible species in the NTMP boundary include Coast Live Oak (*Quercus agrifolia*) and Tanoak (*Notholithocarpus densiflorus*). California Bay Laurel (*Umbellularia californica*) hosts spores of SOD but is not affected to the same degree as Coast Live Oak and Tanoak. Redwood (*Sequoia sempervirens*) and Douglas-fir (*Pseudotsuga menziesii*) can host spores, which can also spread disease through transportation of logs and other woody material (Maloney et al. 2002, Cappellazi and Morrell 2018). Disease spread was projected to increase ten-fold between 2010 and 2030, with most infection concentrated in the north coast between San Francisco and Oregon (Meetenmeyer et al. 2011). This NTMP is located within the Sudden Oak Death Zone of Infestation (ZOI) determined by the California Board of Forestry and Fire Protection (2025).*

Sudden Oak Death (SOD) appears to be present within the NTMP area, as evidenced by dying and dead tanoak trees, but SOD can only be confirmed with laboratory analysis. Sudden Oak Death (SOD) has potential to negatively affect watercourses, soil productivity, biological resources, recreation and visual resources within the WAA. SOD could adversely affect the watershed by increasing sediment due to loss of root structures holding soil, increasing water temperatures due to loss of shade canopy, increasing organic debris on the forest floor and in watercourses due to dead leaves, limbs, and wood, increase peak flows due to loss of tree water uptake, and increase fire hazard due to standing and downed dead and dying woody material. SOD could affect soil productivity by altering the organic matter (leaf drop, small woody material) cycle, and could increase surface soil loss due to exposed soil erosion, root tipping, etc. SOD could affect biological resources by reducing tree cover and habitat, reducing mast production, increasing surface and water temperatures, increasing the fire hazard (loss of habitat), reducing availability of nest/den

trees, etc. SOD could affect recreation and visual resources by showing a significant portion of the forest cover as declining or dying off. All of these negative effects are speculative based upon the level of SOD effects within the plan area and the assessment area.

No host material from the plan area is to be transported outside of the Zone of Infestation. Leaves, twigs, and small branches will not be transported from the NTMP area. SOD has the potential to spread through watercourses, but host material will not be deposited into watercourses as a result of operations. SOD has the potential to spread in mud but yarding and hauling are prohibited during saturated soil conditions. Road watering to prevent dust will only be as much as necessary to prevent dust and not enough to create mud that could compromise tire traction in addition to potentially spreading SOD. All personnel are instructed to clean and encouraged to disinfect boots and tools before moving to an uninfected area. Given the common presence of SOD in Sonoma County, activities within this NTMP are not anticipated to significantly add to the spread and presence of SOD.

#### Past Projects

*Due to the relatively recent introduction of SOD in this region, early projects did not consider disease effects. A fuels reduction and vegetation management project was authorized on the Jenner Headlands Preserve in 2021 including trees affected by SOD (Coastal Conservancy 2021). This project was located near the proposed NTMP.*

#### Present and Ongoing Projects

*Fuel reduction and other vegetation management projects are ongoing. These may or may not affect the level of infestation upstream of the NTMP and consequently downstream. Reopening roads from fallen trees, firewood collection, movement of cattle, and other property maintenance within the assessment area may spread SOD. Public recreation activities within the assessment area that have potential to spread SOD include viewing the mouth of the Russian River from the beach, driving Highway 116, and visitation by property owners and their associates.*

#### Future Projects

*Future projects within the assessment area should include reassessment of Best Management Practices to prevent spread of SOD. Preventative and restorative treatments can reduce the effects of Sudden Oak Death in coastal California forests, though the cost and sustainability of these treatments depends on the landowner's management objectives (Quiroga et al. 2023). Projects associated with NTOs will require preventative measures, including appropriate disposal of plant debris and sanitation measures to minimize pathogen spread (Alexander and Swain 2010).*

*Berry's Knotfarm NTMP: SOD is present throughout the region and appears to be present within the NTMP area. Symptomatic, dying, and dead tanoak trees suggest SOD is affecting the area, but no laboratory analysis has confirmed field observations.*

*This NTMP proposes to follow practices (Section II Item 15) put forward as SOD Best Management Practices by the California Oak Mortality Task Force. These shall be reassessed within each Notice of Timber Operations (NTO) (California Oak Mortality Task Force 2014).*

### Impacts Evaluation

*The existing conditions of Sudden Oak Death within the Assessment Area indicate that SOD has been present within the watershed and region for at least twenty years. Future effects of Sudden Oak Death will be determined by the intensity of infection and rate of spread within the plan area and the WAA. The proposed NTMP activities have the potential to spread SOD, which could present cumulative effects to other resources. Best Management Practices have been described in this NTMP to prevent significant cumulative effects and shall be reassessed within each subsequent Notice of Timber Operations.*

### **Fog Drip**

Sufficient evidence exists to show that trees and understory plants utilize fog drip water inputs, however the action of fog drip recharging groundwater has not been shown. The studies indicate that the greatest impact from fog drip is to the immediate ground vegetation and duff layer underneath the trees and that these plants received the most influence.

There are a number of ways in which fog materializes, depending on how cooling occurred that caused the water vapor to condense. Types of fog include ground fog, advection fog, stream or evaporation fog, precipitation fog, upslope fog, among others, often with some overlap of definition. Fog is also sometimes referred to as a high or low fog, or a dry or wet fog. Fog drip occurs when wind blows wet fog through or across leaf surfaces that intercept suspended small water droplets and vapor 0.01 – 0.1mm in diameter. The intercepted droplets combine on foliage surfaces to form larger drops which form fog precipitation. Factors that affect the intensity of fog drip include water vapor/droplet size, density, topography, time duration, temperature, climate, and type and density of deposition substrate. The intensity of fog drip typically increases with wind speed, and trees on the windward side of stands, typically the west facing aspects in coastal California, receive the greatest amount of moisture. Fog drip is often intensified at low spots or ridge saddles due to the heavier low wet fog passing these points as they are pulled inland toward warm inland air.

Studies have been done to determine if fog drip influences ground water recharge. These studies indicate that the organic "O" layer, the upper "A" horizon, and possibly the "B horizon, receives various degrees of moisture from fog drip. Fog drip inputs were studied by Ingraham and Matthews (1995) and it was determined that fog drip infiltrates at least to the depth of the root zone and that the trees absorb fog-drip water through their roots." Azevedo and Morgan (1974) estimate that forests accumulate approximately 42.5 cm (about 16.7 inches) of annual fog precipitation due to fog drip along the Eel River, and Harr (1991) estimated that annual fog precipitation provided about 50 cm (about 19.7 inches) from a study site in Oregon.

Fog drip measured at the forest floor level does not necessarily equate to delivery to the ground water table or aquifer. Fog drip on surface duff is mostly absorbed by ground vegetation and/or re-evaporated back into the air when the fog dissipates. Analysis of stable hydrogen and oxygen isotopes via mass spectrometer analysis is currently the best tool for tracing fog water movement. Fog water is more isotope enriched than rain having a considerable higher proportion of the hydrogen deuterium isotope and a higher proportion of <sup>18</sup>O (oxygen isotope with atomic weight of 18) than does rain. A study of *Fog: Ecosystem Inputs and Use by Plants*, by Dawson (1998), documents the high usage of fog derived water by plants, and states, "When fog was

most frequent, between 8-34% (mean =  $18.6 \pm 5.0\%$ ) of the water within *S. sempervirens* and between 6-100% (mean =  $66.5 \pm 20.1\%$ ) of the water within the understory plants came from fog after it had dripped from the foliage into the soil. ... The isotopic data clearly demonstrate that plants inhabiting this forest take up a considerable amount of fog from the soil. ... During summer, when fog was most frequent and fog-drip an almost daily occurrence, *S. sempervirens*, obtained between 27-43% of its water from fog; the remainder of its water was derived from a mixture of other water sources from winter rainfall recharge events." Studies by Azavedo and Morgan (1974) support this conclusion, and state, "The isotopic data show that plants inhabiting the fog inundated coastal redwood forests of northern California take up a considerable amount of this water source. ... During the summer, however, when fog was more frequent and fog-drip an almost daily occurrence, up to 34% of trees' water was derived from fog." Yoon (1998) summarized that approximately 35% of the fog precipitation is utilized by trees and plants, 25% moves by runoff, and 40% either evaporates or is absorbed. These studies indicate that trees only supply or augment their use of water by 8-34%, which means that the trees still get the majority of necessary and transpired water through groundwater. A large tree transpires several hundred gallons of water through its leaves on a summer day. This water is "sucked" up under many atmospheres of pressure from the ground up through the tree to be transpired through its leaves. Studies indicate that ground water and peak flows are expected to slightly increase following timber harvesting due to fewer trees transpiring and reduction of fog and rainfall interception.

Harr (1982), in an Oregon watershed study in which 25% of the land base had been patch cut and burned, measured a decrease in annual water yield which was less than 20 millimeters (~0.8 inch). Studies by Keppeler and Ziemer (1990), in the Mendocino County Caspar Creek paired watershed study, where ~50% of the timber volume was removed, indicates, "[I]t was concluded that fog drip makes a highly variable but hydrologically insignificant contribution to groundwater and base flow process at Caspar Creek. Following timber harvest, stream flow increases due to reduced interception and transpiration exceed diminishment due to the loss of fog drip."

### Past Projects

- *Timber Harvesting: Early timber harvesting would have removed all merchantable trees at that time, significantly reducing fog interception by foliage. This was a temporary impact until trees and other vegetation grew to become the second growth forest. Later harvests removed fewer trees. Many sub-merchantable size trees were retained.*
- *Wildland Burning: Burning likely had a minor effect on fog interception and drip as the practice was often performed after initial tree removal. Where no tree removal was conducted, wildfires would have been less intense than they would be today. Fire had been more frequent in pre-settlement times and kept fuel loads lower. Less intense fires would not have substantially reduced mature tree canopy.*
- *Grazing: Forest and other vegetation may have been removed to create pasture for grazing with stumps removed and regrowth prevented. Pasture constitutes a small percentage of the NTMP property and there is no evidence that forest was permanently cleared for pasture.*
- *Road Building: The NTMP area has a substantial road network which was likely forested prior to road development. Tree canopy extends over the roads from the edges, lessening the effect of reduced fog interception and drip. Canopy loss due to the presence of roads*

*is not a substantial percentage of the total potential canopy area within the NTMP.*

#### Current and Ongoing Projects

*Timber harvesting is ongoing using selection and thin-from-below silviculture methods. These methods retain at least 50% of trees greater than 12 inches diameter (dbh). Tanoak is dying on some parts of the property, reducing canopy. This is a temporary effect on fog drip as the remaining tree crowns will grow to take advantage of the available sunlight. No other tree removal projects are occurring in the NTMP area.*

#### Future Projects

*Berry's Knotfarm NTMP: Timber harvesting using selection silviculture would retain at least 50% of trees greater than 12 inches diameter (dbh). Canopy will be higher in the WLPZ as the requirement for Class II watercourses is retention of at least 80% total canopy.*

*SOD and Tree Planning: SOD is expected to continue to infect more tanoak trees and remove canopy. Tree planting to replace dead tanoaks is anticipated.*

*There are no other substantial tree removal projects anticipated.*

#### Impacts Analysis

*Some small reduction in fog drip derived available water is anticipated due to harvesting under the NTMP. However, the loss will not be significant. Fog drip reductions are substantially offset by the local rainfall totals and reduced evapotranspiration. New and released growth will occupy the growing space and reduce the canopy interception loss impact over time. Harvesting under the NTMP is not expected to result in significant adverse individual or cumulative environmental effects related to fog drip, groundwater, or base flow processes.*

## ANALYSIS OF ALTERNATIVES TO THE PROJECT

As a Certified Regulatory Program under CEQA, the NTMP process is exempt from the requirement to prepare Environmental Impact Reports (EIRs) and related provisions of CEQA. However, a NTMP must include “a description of the proposed activity with alternatives to the activity, and mitigation measures to minimize any significant adverse effect on the environment of the activity.” PRC § 21080.5(d)(3)(A); 14 CCR §§ 15250-15253.

CAL FIRE has informed RPFs that they must submit an alternative analysis with proposed harvesting plans and has given RPFs guidance in preparing that analysis, based on the CEQA guidelines that control the alternatives analysis in EIRs (14 CCR § 15126.6). Those CEQA guidelines are not directly applicable to the NTMP process as a certified regulatory program. However, they provide the only available guidance on preparing an alternative analysis. Nevertheless, there are some important differences between the NTMP process and the EIR process that make the EIR guidelines difficult to apply.

An EIR must be prepared where the lead agency has identified potentially significant effects from the project as proposed. In the EIR process, where the lead agency determines that the project as proposed would not result in significant environmental effects, the agency prepares a negative declaration or a mitigated negative declaration- rather than an EIR. Where an EIR is necessary, it must describe reasonable alternatives to the project, or to the location of the project, which would avoid or substantially lessen those significant effects the lead agency has identified.

The Certified Regulatory Program’s CEQA process for harvesting plans is designed to have the same result as a mitigated negative declaration, i.e., as proposed, a NTMP will be designed to avoid significant environmental effects or to mitigate such effects to the point where no significant effects will occur. The NTMP process is based on the Forest Practice Rules, which reflect a layer of analysis that is not utilized in the EIR process. That is, the Forest Practice Rules are developed and adopted by the Board of Forestry as programmatic prescriptions and best management practices designed to avoid significant impacts of timber harvesting, road building and other timber operations as they are applied by the RPF in preparing a NTMP. In addition to requiring RPFs to apply these prescriptions in preparing harvest plans, the Forest Practice Rules require plan submitters to conduct a site-specific analysis of potentially significant individual and cumulative effects that may not have been avoided or mitigated by simply applying the prescriptions contained in the Forest Practice Rules. The RPF must incorporate feasible measures in the NTMP to avoid or mitigate such effects.

In preparing this NTMP, the RPF has applied the prescriptive standards of the Forest Practice Rules to avoid potentially significant site-specific individual and cumulative effects identified during NTMP preparation. Accordingly, the RPF has submitted a NTMP that already serves CEQA’s objective of avoiding or substantially lessening significant environmental effects.

Applying the EIR-related alternatives requirements to the NTMP process, the RPF faces the paradox of identifying alternatives to the NTMP that will avoid or substantially lessen any of the significant environmental effects of the NTMP where none has been identified—because the

RPF has, as required by the Forest Practice Rules, already incorporated measures into the NTMP that will avoid or substantially lessen potentially significant effects.

Although no potentially significant environmental effects have been identified in the NTMP as proposed, the RPF has analyzed alternatives which could avoid or substantially lessen environmental effects that are typically identified in the preparation and review of harvest plans in this region (as discussed above, many if not all such effects are addressed in the NTMP when first submitted for review). The RPF has used CEQA's EIR-related guidelines as well as CAL FIRE's guidance dated June 10, 1997 for addressing alternatives in the NTMP process.

CEQA does not require any fixed number of alternatives and does not require inclusion of every conceivable alternative 14 CCR 15126.6(a). Further, CEQA does not require the consideration of alternatives whose effect cannot reasonably be ascertained and whose implementation is remote and speculative. Instead, the CEQA guidelines provide that a "reasonable range" of alternatives must be selected for discussion, applying a rule of reason, 14 CCR 15126.6 (a)(c)(f). In accordance with CEQA's principles, the alternatives selected for detailed examination in this NTMP are limited to ones that would avoid or substantially lessen any of the significant effects of the project, assuming that such impacts had been identified, and that could feasibly attain most of the basic objectives of the project. Finally, under CEQA, the alternatives considered need only relate to the project as a whole, not to its various parts, *Big Rock Mesas Property Owners Assoc. v. Board of Supervisors (1977)*, 73 Cal. App. 3d 218, 227. The NTMP describes the rationale for selecting the alternatives to be discussed, including an explanation of why some alternatives were considered but not selected for detailed discussion in the NTMP.

### **Project Description and Objective:**

The project is described in the NTMP. All of the required contents as outlined in 14 CCR 1090.5 have been included in this plan document. Specifically, reference Sections I, II and III of the plan for project description information. *In short, this plan proposes to harvest approximately 1099 acres using Selection silviculture by tractor and cable yarding systems, within the Willow Creek Planning Watershed located in a portions of the Duncans Mills Quadrangle, Projected Sections 5, 7, 8, 9, 17, and 18 Township 7 North, Range 11 West, MDB&M, Sonoma County, CA.* The RPF has assessed how the project will interact with the environment in the cumulative impacts assessment; reference Section IV of this plan. The project is to be carried out in accordance with the California Forest Practices Act and other applicable rules and regulations. Potential impacts will be less than significant using the methods prescribed in the Forest Practice Rules, and other site-specific measures incorporated into the NTMP through the recommendations of the multi-agency, inter-disciplinary, review team process.

The landowner's objectives in undertaking the project are:

1. Continue to utilize the property for a combination of uses including recreation, timber production, domestic water production, wildlife and watershed values, and other uses as permitted by the Land Extensive Agriculture District zoning.
2. Maintain economic vitality of management activities through periodic selective timber harvesting.
3. Maximize sustainable production of high quality timber products.
4. Provide for a fire safe forest landscape.
5. Enhance stand health and productivity in terms of projected growth, while maintaining appropriate stocking.
6. Maintain and enhance the visual aesthetics of the forest resources.
7. Maintain permanent, seasonal, and tractor roads and landings to provide safe access, minimize effects of surface erosion, to facilitate interim management activities, and to minimize new construction.
8. Maintain or increase conifer species composition in relation to hardwood occupancy utilizing natural regeneration, planting, and control treatments as appropriate.
9. Maintain the health and integrity of the forest resources, inclusive of all native flora and fauna, and preserve its function in the watershed.
10. Demonstrate land stewardship through implementation of high standards of logging practices.
11. Provide for cost efficiency and regulatory certainty through approval of long-term management plan.

**Alternatives considered for examination:**

The RPF considered the following alternatives for inclusion in the NTMP:

- 1) The project as proposed and described in this NTMP.
- 2) No project.
- 3) Alternative silviculture method. This alternative includes consideration of different silvicultural systems.
- 4) Alternative yarding method. This alternative includes consideration of different harvesting methods.
- 5) Alternative project size. This alternative includes consideration of conducting operations similar to that proposed in this NTMP, however under increased or decreased acreage size, and/or different shape/layout of the NTMP boundary.
- 6) Alternative timing of project. This alternative considers delaying the proposed project for a period of time in order delay any potential environmental impacts.
- 7) Alternative project location. This alternative considers relocating the project to a different location.
- 8) Alternative land use. This alternative considers the implementation of other permitted uses of the subject parcel rather than the NTMP.
- 9) Purchase of Timber/Timberland as a Conservation Easement.
- 10) Public Park Addition

## ALTERNATIVES SELECTED FOR DETAILED EXAMINATION

### **1. Project as Proposed:**

The project as proposed and described in the NTMP provides for sustainable and environmentally protective land management that yields needed revenue for the landowner. Potentially significant impacts on the environment, including sedimentation, landslides, wildlife habitat loss, impacts to cold water fisheries and domestic water supplies, which could result from harvest operations have been analyzed in the NTMP and protective measures required to avoid those impacts or reduce them to insignificance. Forest roads will be maintained and improved as described in the plan to reduce the amount of sediment that reaches the streams. Watercourse protection zones will help to protect the riparian areas within the NTMP. Wildlife and sensitive plan protection measures have been incorporated into the plan. The silvicultural prescriptions incorporated within the plan are designed to maintain forest stocking and health over time. The project as proposed is technically feasible given the silviculture, yarding method, time restrictions, required resources such as personnel, equipment, roads, rock, and water, and is feasible based on other operational constraints. The NTMP has been reviewed by a multi-agency, multi-disciplinary review team, and permit approval is pending from the lead agency. The project as proposed is the preferred and environmentally superior alternative.

### **2. No Project Alternative:**

The no project alternative would involve not carrying out the project as proposed, and not carrying out any alternative project. The no project alternative would maintain the existing conditions. The no project alternative would indefinitely delay or prohibit the filing of a long-term timber management plan which would address all of the timberland resources and timing of activities rather than operating in a piecemeal manner, one short-term harvest plan at a time. A larger landscape and temporal view provided by an NTMP allows the landowner, regulatory agencies, and the public to better understand impacts and make decisions accordingly. Long-term plans enhance the owner's ability to improve forest growth and health and provide for resource improvements throughout the NTMP area. The no project alternative would not improve stocking or achieve sustainable production of forest products. In the absence of this project, fuel loading and fuel continuity would likely increase, thereby increasing the potential for high intensity wildfire. Fire history of the region indicates that high intensity wildfires may occur and continuous preparedness is prudent.

The no project alternative would avoid potential negative environmental impacts that might occur in connection with the proposed timber operations. However, it would not provide for positive environmental effects that would result from implementing the NTMP including road improvements, forest stand improvements, and fire hazard reduction. The current conditions, or 'status-quo' would be maintained.

The project area is adjacent to large tracts of timberland and is dominated by second growth conifers. In terms of historic use and suitability for logging, the NTMP area has historically been

harvested. The no project alternative would lead to non-operation on land that is capable of producing sustainable forest resources over the long-term.

### **3. Alternative Silviculture Method:**

This alternative would involve harvesting/regenerating the NTMP area in a manner different from that proposed in the NTMP. Alternatives would include different silviculture/regeneration methods.

The silvicultural prescription in the NTMP was chosen based on what is allowed by the Forest Practice Rules and on current timber stand conditions as the best means to meet the landowner's objectives while minimizing potential impacts to the environment, and secondarily to comply with the objectives of 14 CCR 913, PRC 4512 and PRC 4513, which is to achieve maximum sustained production of high quality timber products (MSP). Alternative silvicultural prescriptions were analyzed by the RPF during preparation of the NTMP and rejected as not being the best methods to achieve MSP and comply with the Forest Practice Rules. The following is a discussion of the various silvicultural systems that were considered, but rejected:

Even-aged silviculture methods:

These silvicultural methods were not considered as they are not allowed by the Forest Practice Rules for NTMP's.

Uneven-aged silviculture methods:

Selection per 913.2 (a) (1). With the selection silvicultural system, trees are removed individually or in small groups from 0.25 to 2.5 acres. The selection silvicultural method is further categorized into stocking standards for Single Tree Selection and Group Selection.

*Group Selection method allows small group openings up to 2.5 acres. Not more than one third of the stocked plots may meet Stocking Standards of 912.7(b)(1). At least two thirds of the stocked plots must meet the Stocking Standard using the 913.2(a)(2)(A) 125 trees per acre point count standard for Site Class III and 100 trees per acre for Site Class IV with trees that are at least five years old.*

Transition:

The transition method was not chosen as an alternative because the preharvest basal area of the timber stands exceeds the maximum specified for this method.

Intermediate Treatments:

Commercial thinning: This silviculture method is primarily directed toward maintaining or increasing average stand diameter and growth in a young-growth timber stand. The stand structure of the NTMP area includes trees of all size classes and there is no inherent need to increase the average stand diameter. Although this method could be applied to portions of the plan area, similar objectives can be achieved with the chosen method.

Sanitation salvage:

This method involves two parts: Sanitation- the removal of insect-attacked or diseased trees in order to maintain or improve the health of the stand, and Salvage- the removal of only those trees which are dead, dying or deteriorating, because of damage from fire, wind, insects, disease, flood or other injurious agents. Although there are trees that exhibit indicators of disease (conk rot), the stand as a whole does not exhibit enough characteristics to warrant this silvicultural method. In addition, this method has a tendency to conflict with the Department of Fish and Wildlife's desire to retain trees that are dead and dying for wildlife purposes.

#### Rehabilitation of Understocked Areas:

This method is used to restore and enhance the productivity of timberlands which do not meet stocking standards. The NTMP area was evaluated and the timberlands exceed the minimum stocking standards eligible for this method, therefore this prescription is not applicable.

#### Fuelbreak/Defensible Space:

This method is used to remove fuels to create a shaded fuel break or defensible space to reduce the potential for wildfires to meet the objectives of a Fuelbreak area. There are no habitable structures in the NTMP area warranting defensible space. Fuelbreak creation would limit conifer regeneration and providing for MSP.

#### Variable Retention:

This method is used to retain important forest structure elements in the forest stand while allowing spatial and forest density parameter flexibility. Variable retention harvesting can use dispersed or aggregated retention of features. The NTMP could use this method, but the RPF determined that implementation of this method was not necessary to achieve conifer regeneration and MSP.

#### **4. Alternative Yarding Method:**

This alternative would involve harvesting the NTMP area in a manner different from that proposed in the NTMP. Alternatives would include different logging methods.

Various yarding methods were analyzed by the RPF during preparation of the NTMP. The yarding methods as proposed in the NTMP were chosen based on topography, historic use, current stand conditions in the NTMP area and functional feasibility. The following is a discussion of the various silvicultural systems that were considered, but rejected as not meeting the objectives of the project:

##### **Animal:**

This method was rejected because the landowner and contract loggers do not own, or have access to livestock for this purpose. Animal logging cannot generate a sufficient flow of logs for efficient delivery of logs within the operational window created by seasonal restrictions and regulations. Potential adverse impacts associated with use of animals for logging include high ground compaction, increased erosion and concentrated animal feces. It is likely that this method would create greater environmental damage than the proposed methods. Therefore, it is more feasible for the landowner to utilize conventional logging equipment.

##### **Helicopter and/or balloon yarding:**

This harvesting method could have been incorporated; however, it is unlikely that any LTO currently utilizes the balloon yarding method. The helicopter yarding method could have been incorporated, and would likely result in fewer potential soil impacts, however the noise impacts produced by this method would impact far more residences and existing wildlife than the proposed method. Additionally, the NTMP area contains a road network that requires upgrading which can potentially reduce the long-term environmental impacts from this road system. Regardless of utilizing the helicopter yarding method, upgrading the drainage system of the road network would still be required in the plan.

The logging methods that were chosen are ground-based yarding, including tractor, end/long lining and rubber-tired skidder, and cable skyline yarding. These methods were chosen because the area has some slopes suitable for ground base yarding, and some slopes suitable for cable yarding. The RPF considered as an alternative adjusting the level of ground-based to cable-based yarding systems. Increasing the amount of cable harvesting may result in reduced impacts, mainly to the soil resource and watercourses. The entire area appears to have been previously harvested using tractors and/or skidders. Tractor roads already exist throughout the majority of the area. Some areas of the property are steep and exceed the recommended use restrictions of ground-based equipment and or near steep watercourse areas; cable yarding was chosen for these areas to reduce environmental impacts. The proposed cable operations are planned to encompass the steepest slopes of the main watercourses within the NTMP area. The NTMP includes a provision that would allow the LTO the option to operate more cable-based yarding (in ground-based areas). Less tractor yarding would provide less opportunity for soil disturbance and sedimentation. In some cases, less tractor yarding is not possible due to slope, topography, and access. The NTMP as proposed includes a logical balance of the chosen yarding systems to efficiently conduct operations while balancing environmental and economic considerations.

Yarding method impacts are less than significant with the layout designed to avoid tractors on steep slopes, the recommendations of a multi-agency, multi-disciplinary review team, and the implementation of the Forest Practice Rules (FPRs).

### **5. Alternative project size:**

This alternative would include only a portion of the timberland within the proposed NTMP area. The proposed NTMP area already includes all of the forested ownership and therefore cannot be increased.

Implementing a smaller size NTMP reduces the ability of the plan to efficiently manage logging costs and time, financial capital, and environmental corrections. A smaller sized NTMP would be a feasible alternative, however it may not necessarily reduce environmental impacts, and could increase environmental impacts due to avoidance of drainage upgrades. For this reason, this alternative was not selected as being the most holistic management scenario balancing timber harvesting, economic considerations, and environmental correction work.

A smaller size NTMP would exclude areas of the ownership that would benefit from management that would increase conifer growth rates and create fuel separation.

### **6) Alternative Timing of the project:**

This alternative would involve carrying out the project with longer cutting cycles or delaying the commencement of implementation of the approved NTMP. Delaying commencement of operations would not be economically feasible as the landowner has invested substantial time and money coordinating the proposed project. Flexibility is preferred to take advantage of log markets, favorable logging costs, and operator availability. Upgrades and erosion control measures are designed to be implemented concurrently with operations as they are not economically feasible without revenue. Fuel modification and road access maintenance would be delayed which would increase wildfire risk.

MSP is achieved by timing harvests based on periodic and average growth rates. Alternative timing would be arbitrary or speculative. It is preferable to rely on actual growth rates measured over time.

### **7) Alternative Project Location:**

This alternative would involve carrying out the harvesting proposed in the NTMP at a different location. This would result in the property currently proposed for this NTMP being in an unmanaged and overgrown condition. Tree growth would slow due to competition for resources and hazardous fuel conditions would develop. Regeneration would be hampered. Disease and pests could spread unchecked. Maximum sustained production would not be realized. The land would not be managed for its highest and best use.

Harvest plan approval and implementation results in a thorough assessment of potential erosion and sediment sources which are remedied when a plan is implemented. Although those issues could be addressed without a plan, ineffective or damaging practices might be employed without

the input of experts. Property maintenance needs may be known but not acted upon due to a lack of financing.

Adverse impacts that may occur on this NTMP area, in connection with the proposed timber operations, are not materially distinguishable from impacts that may occur, should the planned timber operations be carried out at some alternative property in the region.

It may not be the case that significant effects of the project would be avoided or substantially lessened by implementing the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion. In this case, the NTMP potential impacts would also typically be potential impacts at other locations. Accordingly, potential impacts associated with this NTMP may not be altogether avoided but be shifted to another location. Harvesting at other locations would require many of the same measures to avoid or substantially lessen such impacts.

#### **8) Alternative Land Uses:**

These timberlands of the landowner are zoned Timber Preserve/Production Zone. This zoning establishes a permitted use of timber harvesting under Sonoma County Code of Ordinances, Chapter 26 – Sonoma County Zoning Regulations, Article 06. – Agriculture and Resource Zones, Section 26-06-030. A complete list of permitted uses is contained in NTMP Section V.

The alternative land uses described in Section 26-06-030 are feasible, but not environmentally superior to the project described in the NTMP. If implemented, they may result in adverse environmental impacts that exceed those which may occur in connection with proposed timber operations as described in the NTMP.

#### **9) Purchase of Timber/Timberland as a Conservation Easement:**

Under this alternative, the ownership would be sold to a land trust organization or placed under a conservation easement. This action would not necessarily preclude harvesting. Many conservation trust organizations use periodic harvests as a means of obtaining revenue for future acquisitions and operating costs. Terms of conservation easements can be variable from creating “park-like” or “old growth” conditions to MSP harvesting to simply limiting development. Payments to landowners and tax breaks resulting from easements are certainly incentives to enter into such agreements. Easements are inherently restrictive and therefore may not be the preferred alternative where maximum flexibility under the law is the most conducive to proper management.

#### **10) Public Park Addition:**

This alternative would have the property incorporated into state or county park systems. The alternative assumes that a park department has the financial ability and desire to purchase all or part of the property. If such an acquisition were to occur, infrastructure would need to be developed for recreation and emergency access along with ongoing maintenance. The effect of public recreation is not benign and must be considered as a potential impact. Parks are not

typically managed for MSP. The result would be removing or reducing a local source of timber resources and the associated jobs and revenue.

## **COMPARISON AND SELECTION OF PROJECT ALTERNATIVES**

### **1) Project as Proposed:**

The project as described in this NTMP is preferred over the project alternatives for the following reasons:

### **2) No Project:**

The no project alternative would eliminate all possible adverse impacts directly associated with the timber harvesting plan. It does not provide for correcting existing environmental problems. If the No Project Alternative applies here, then it would apply to other areas, ownerships, and projects. The evaluation of similar recent past projects within the region indicates that the no project alternative was not selected as the preferred alternative.

### **3) Alternative silviculture method:**

*Alternative silvicultural prescriptions are either not eligible for an NTMP or are not necessary to maintain stocking and achieve maximum sustained production. In the case of selection silviculture per 913.2 (a), group selection, residual stocking described in (913.2 (a) (2) (B)) was not selected as a preferred alternative but individual tree selection, residual stocking described in (913.2 (a) (2) (A)) was selected.*

### **4) Alternative yarding method:**

This alternative may potentially increase the level of possible environmental impacts, depending upon the chosen method. Animal yarding was rejected due to the unavailability of livestock for this purpose and the increased environmental impacts. Helicopter yarding was rejected due to the noise impacts to surrounding residents, the town of Jenner, and wildlife,

### **5) Alternative project size:**

Reducing the size of the NTMP reduces the ability of the plan to efficiently manage logging costs and time, financial capital, and environmental corrections such as maintenance of proper drainage. It would exclude areas of the ownership that would benefit from management that would increase conifer growth rates and create fuel separation. This alternative was not selected as being the most holistic management scenario balancing timber harvesting, economic considerations, and environmental correction work.

### **6) Alternative timing:**

Delaying implementation of the project to a later point in time would mitigate or avoid possible

significant adverse impacts related to the NTMP area until the point in time in the future when the area is harvested. In fact, by extending the timing of the project, vegetation and fuels would only further accumulate on site. Existing environmental impacts occurring in the NTMP area would not be corrected. Thus, the alternative timing alternative is not environmentally superior to the proposed project.

**7) Alternative project location:**

Relocating the project to an alternative location would not mitigate or avoid possible significant adverse impacts in the NTMP because not operating on the NTMP area would not allow the property owner to manage the property. Current existing impacts within the project area would not be corrected, which may result in significant environmental impacts. This alternative is not environmentally superior to the preferred alternative.

**8) Alternative land uses:**

An alternative land use, while feasible, is not environmentally superior to the project as described in the NTMP. If implemented, it would likely result in different environmental impacts that may exceed those which may occur in connection with proposed timber operations.

**9 Purchase of Timber/Timberland as a Conservation Easement:**

This alternative has merit unless except that easements are inherently restrictive and therefore may not be the preferred alternative where maximum flexibility under the law is the most conducive to proper management.

**10) Public Park Acquisition:**

This alternative would result in removing or reducing a local source of timber resources and the associated jobs and revenue.

**1) The Project as Proposed:**

Because the NTMP as proposed, as described in the NTMP, with all the protection measures incorporated, will not likely result in significant adverse effects, it is selected as the preferred alternative. Because the proposed NTMP meets that basic objective of CEQA, the selection of another alternative to this NTMP is not necessary to serve the basic purpose of avoiding or substantially lessening significant impacts of the NTMP. It is entirely consistent with CEQA and pertinent case law to approve a project that has its potential environmental impacts avoided or reduced to relative insignificance, as is the case here, rather than selecting a separate project alternative that would itself result in no significant adverse impacts, even if the alternative would be environmentally superior. See Laurel Hills Homeowners Association v. City Council of the City of Los Angeles (1978) 83 Cal. App.3d 515, 520; Laurel Heights Improvement Association of San Francisco, Inc. v. The Regents of the University of California (1988) 47 Cal. 3d 376, 401.

## **CUMULATIVE IMPACTS SUMMARY STATEMENT**

The project as proposed describes many resource categories and individual resource attributes that describe the environmental conditions encountered on the project site. Although the plan incorporates a comprehensive analysis of resource attributes, it is not feasible to consider every possible resource attribute or possible environmental effect. The plan describes the most significant resources and most likely resource attributes to be affected by the proposed plan.

Environmental effects from projects can potentially range from obvious and destructive to minor and incremental. The most obvious environmental effects have been identified and reduced to a level of insignificance by appropriate planning and protection measures. Some effects are discreet and possibly delayed, and as such, the project may not or cannot identify or mitigate certain minor environmental impacts. Minor and incremental effects, as well as unknown and delayed effects, may combine to create some cumulative effects, however this analysis has not identified any minor, incremental, or delayed effects that will rise to a level of significance or could be feasibly further mitigated or reduced.

The plan has been designed to obviate (to prevent by effective measures) a comprehensive range of environmental effects related to timber harvesting activities so as to not elevate them to a level of significance. The project as proposed has potential environmental impacts avoided, mitigated, or reduced to relative insignificance.

## References

Alakukku, L., P. Weisskopf, W.C.T. Chamen, F.G.J. Tjink, J.P. van der Linden, S. Pires, C. Sommer, & G. Spoor (2003). Prevention strategies for field traffic-induced subsoil compaction: a review: Part 1. Machine/soil interactions, Soil and Tillage Research. Volume 73, Issues 1–2.

*Alexander, J.M.A., Swain, S.S. Pest Notes: Sudden Oak Death UC ANR Publication 74151. (Updated 09/2010).*

Battles, John J., et al. — 2006 Climate Change Impact on Forest Resources: A Report from California Climate Change Center

Board of Forestry and Fire Protection (2008); Report (Draft) to ARB on Meeting AB 32 Targets  
California Environmental Protection Agency-Air Board (2008); News Release 08-103, December 12, 2008, “ARB adopts landmark rules to clean up pollution from ‘big rigs’.”

Burchill, Bonnie J. – 2008, Long Term Management of Non-Industrial Private Property Under California Forest Practice Rules Using Non-Industrial Timber Management Plan. Description of Emission Reduction Measure Form, California Air Resources Board, Submitted on Behalf of Forest Landowners of California.

California Department of Forestry and Fire Protection. Fire and Resource Assessment Program (FRAP). Accessed 2024 and 2025 at <https://www.fire.ca.gov/what-we-do/fire-resource-assessment-program/fire-perimeters>

California Air resources board. 2022 Scoping Plan for Achieving Carbon Neutrality, November 16, 2022.

Cafferata et al. California Department of Forestry and Fire Protection, Designing Watercourse Crossings for Passage of 100-year Flood Flows, Wood, and Sediment, February 2017.

Cafferata, Peter And Spittler, Thomas, Logging impacts of the 1970’s vs. the 1990’s in the Caspar Creek Watershed. USDA Forest Service Gen. Tech. Rep. PSW-GTR-168. 1998.

CalFish. A California Cooperative Anadromous Fish and Habitat Data Program. Passage Assessment Database. [www.calfish.org](http://www.calfish.org).

California Air Resources Board (2008, 2013, 2017, 2022). AB 32 Climate Change Scoping Plan. <https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan>.

California Association of Environmental Professionals (AEP), 2011 California Environmental Quality Act (CEQA) Statute and Guidelines, January 1, 2011.

California Coastal Conservancy. 2021. Jenner Headlands Preserve Fuels Reduction. Project No. 08-064-03.

California Code of Regulations, Title 14, California Code of Regulations, Chapters 4, 4.5, and 10. California Forest Practice Rules, 2013-2014.

California Department of Fish and Game, Letter to Interested Parties dated April 4, 2001 from Sandra Morey, Chief of the Habitat Conservation Planning Branch.

California Department of Fish and Game, Stream Inventory Report, Revised April 14, 2006

California Department of Fish and Wildlife, BIOS, Northern Spotted Owl Database. <https://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp>

California Department of Fish and Wildlife, California Natural Diversity Database, Rarefind5. <https://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp>

California Department of Forestry and Fire Protection, Fire Hazard Severity Zones. Accessed at: <https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones>

California Department of Forestry and Fire Protection, Greenhouse Gas Emissions Calculator.  
California Department of Forestry and Fire Protection, <https://caltreesplans.resources.ca.gov/caltrees/>.

California Department of Forestry and Fire Protection, Watershed Mapper.  
[http://egis.fire.ca.gov/watershed\\_mapper/](http://egis.fire.ca.gov/watershed_mapper/) and <https://data.ca.gov/showcase/cal-fire-watershed-mapper>

California Department of Forestry and Fire Protection, Cultural Resource Management.  
<https://www.fire.ca.gov/what-we-do/natural-resource-management/environmental-protection-program/cultural-resource-management>

California Department of Forestry and Fire Protection, Website General Home Page <http://www.fire.ca.gov/php/>

California Department of Tax and Fee Administration. Timber Production Figures (Table 38B).  
<https://www.cdtfa.ca.gov/dataportal/dataset.htm?url=PropTaxTimberProductionStats> . Accessed May 3, 2024.

California Division of Mines and Geology. Geology for Planning in Sonoma County. Special Report 120. 1980.

California Energy Commission — 2004. Baseline Greenhouse Gas Emissions for Forest, Range, and Agricultural Lands in California.

California Native Plant Society, Inventory of Rare and Endangered Plants, version 7, website:  
<http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi>

CNRA, CalEPA. Report to the Joint Legislative Budget Committee on the Timber Regulation and Forest Restoration Program, Assembly Bill 1492. Fiscal Years 2021-22 & 2022-2023.

California Oak Mortality Task Force, Sudden Oak Death, website: <http://suddenoakdeath.org/>

California Public Resources Code, Division 4.

California State Board of Forestry and California Fish and Game Commission, Joint Policy Statement on Coho Salmon.

California State Board of Forestry and California Fish and Game Commission, Joint Policy on Hardwoods.

*Cappellazzi, Jed, and Morrell, Jeffrey J. "Potential for Using Borates to Mitigate the Risk of Phytophthora ramorum Spread on Douglas-Fir Logs." Forest Products Journal, vol. 68, no. 1, 2017, pp. 64–66. https://doi.org/10.13073/FPJ-D-17-00037. Accessed 23 October 2025.*

Fellers, G. M., and E. D. Pierson. 2002. Habitat use and foraging behavior of Townsend's big-eared bat (*Corynorhinus townsendii*) in coastal California. *Journal of Mammalogy* 83:167-177.

Forest Climate Action Team (2018). California Forest Carbon Plan: Managing Our Forest Landscapes in a Changing Climate. <https://resources.ca.gov/CNRALegacyFiles/wpcontent/uploads/2018/05/California-Forest-Carbon-Plan-Final-Draft-for-Public-ReleaseMay-2018.pdf>.

Hanna, M. & Al-Kaisi, M. M. (2009). Resource Conservation Practices: Understanding & Managing Soil Compaction. Iowa State University Extension.

Google Earth.

Ice, George G., et al. "Understanding dissolved oxygen concentrations in a discontinuously perennial stream within a managed forest." *Forest Ecology and Management* 479 (2021): 118531.

- Ingraham, Neil L. and Robert A. Mathews. 1995. The Importance of fog-drip water to vegetation: Point Reyes Peninsula, California. *Journal of Hydrology* 164. pp 269-285.
- James, C.; B. Krumland, and P. Eckert — 2007. Carbon Sequestration in California Forests; Two Case Studies in Managed Watersheds. <http://www.spi->
- Keppeler, E.T. 1998. The summer flow and water yield response to timber harvest. USDA Forest Service General Technical Report PSW-GTR-168. pp. 35-43.
- Kliejunas, John T. 2010. Sudden oak death and *Phytophthora ramorum*: a summary of the literature. 2010 edition. Gen. Tech. Rep. PSW-GTR-234. Albany, CA.: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.
- Lippke, B.; J. Perez-Garcia, J. Bowyer, J. Meil — 2004. CORRIM: Life Cycle Environmental Performance of Renewable Building Materials. *Forest Products Journal* 54(6):8-19.
- Mader, S. 2007. Climate Project: Carbon Sequestration and Storage by California Forests and Forest Products. <http://www.foresthealth.org/pdf/CH2M%20Hill%20Forest%20%Carbon%20Study.pdf>
- Maloney PE, Rizzo DM, Koike ST, Harnik TY, Garbelotto M. First Report of Phytophthora ramorum on Coast Redwood in California. Plant Dis. 2002 Nov;86(11):1274. doi: 10.1094/PDIS.2002.86.11.1274A. PMID: 30818489.*
- Marcot, B.G. 1984. Winter use of some northwestern California caves by western big-eared bats and long-eared myotis. *Murrelet* 65:46.
- Mazurek, M. J. 2004. A maternity roost of Townsend's big-eared bats (*Corynorhinus townsendii*) in coast redwood basal hollows in northwestern California. *Northwestern naturalist* 85:60-62.
- Meentemeyer, R. K., N. J. Cunniffe, A. R. Cook, J. A. N. Filipe, R. D. Hunter, D. M. Rizzo, and C. A. Gilligan. 2011. Epidemiological modeling of invasion in heterogeneous landscapes: spread of sudden oak death in California (1990–2030). Ecosphere 2(2):art17. doi:10.1890/ES10-00192.1*
- Miralha, L., C. Segura, K. D. Bladon (2024). Stream temperature responses to forest harvesting with different riparian buffer prescriptions in northern California, USA, *Forest Ecology and Management*, Volume 552-1121581.
- National Marine Fisheries Service. 2012. Final Recovery Plan for Central California Coast coho salmon Evolutionarily Significant Unit. National Marine Fisheries Service, Southwest Region, Santa Rosa, California.
- National Marine Fisheries Service, West Coast Region, (2005). Steelhead Critical Habitat [ds122]. Calif. Dept. of Fish and Wildlife. Biogeographic Information and Observation System (BIOS). Retrieved March 21, 2024 from <http://bios.dgf.ca.gov>.
- Oregon Forest Resources Institute (OFRI) — 2024. Foresets, Carbon and Climate Change. <https://oregonforests.org/carbon>. Accessed May 3, 2024.
- Perez-Garcia, J.; B. Lippke, J. Connick, and C. Manriquez — 2005. An Assessment of Carbon Pools, Storage, and Wood Products Market Substitution Using Life-Cycle Analysis Results. *Wood Fiber Science* 37(5):99-113
- Pierson, E.D. and W.E Rainey. 1998. The distribution, status and management of townsend's big-eared bat (*Corynorhinus townsendii*) in California. California Department of Fish and Wildlife, Bird and Mammal Conservation Program Report. 96-7. 49p.
- Pierson, E. D., W. E. Rainey, and D.M. Koontz. 1991. Bats and mines: experimental mitigation for Townsend's big-eared bat at the McLaughlin Mine in California. Pp. 31-42, in *Issues and technology in the management of impacted wildlife*, Snowmass, CO. April 8-10, 1991, Proceedings, Thorne Ecological Institute.

Quiroga, G.B.; Simler-Williams, A.B.; Frangioso, K.M.; Frankel, S.J.; Rizzo, D.M.; Cobb, R.C. 2023. *An experimental comparison of stand management approaches to sudden oak death in restoration and prevention contexts*. *Canadian Journal of Forest Research*. <https://doi.org/10.1139/cjfr-2022-0328>.

Rizzo, D.M.; Garbelotto, M.; Hansen, E.M.; 2005. *Phytophthora Ramorum: Integrative Research and Management of an Emerging Pathogen in California and Oregon Forests*. *Annual Review of Phytopathology*.

Russian River Estuary Adaptive Beach Management Plan 2021. Prepared for Sonoma Water, Prepared by Environmental Science Associates with Bodega Marine Laboratory, University of California at Davis June 21, 2021.

Russian River Estuary Management Project Draft EIR, Environmental Science Associates. December 2010.

Sonoma County Assessors Plats

Huffman, M.E. and Armstrong, C.F. Special Report 120. *Geology for Planning in Sonoma County California*. 1980

Steinhart, Peter, *California's Wild Heritage - Threatened and Endangered Animals in the Golden State*, California Department of Fish and Game, 1990.

*THPs 1-01-105-SON, 1-02-129-SON, 1-03-073-SON, 1-03-146-SON, 1-05-099-SON, 1-08-025-SON, and 1-12-040-SON on record with California Department of Forestry and Fire Protection, Santa Rosa, CA Office.*

Tipton, V. M. 1983. Activity patterns of a maternity colony of *Plecotus townsendii virginianus*. *Bat Research News* 24:56-57.

United Nations Intergovernmental Panel on Climate Change (IPCC). Working Group III Contribution To The IPCC Sixth Assessment Report (AR6), 2021.  
[https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC\\_AR6\\_WGIII\\_TS.pdf](https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_TS.pdf)

USDA, NRCS Web Soil Survey. February 21, 2024. Custom Soil Resource Report for Sonoma County, California, Willig Ranch. Accessed at <https://websoilsurvey.nrcs.usda.gov/app/>.

U.S. Department of Energy. <http://www.energy.ca.gov/reports/CEC-500-2004-069/CEC-500-2004-069F.PDF>

U.S. Environmental Protection Agency (U.S.E.P.A.) — 2005. *Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture*. Available at: National Service Center for Environmental Publications. [Epa.gov/nscep](http://epa.gov/nscep)

U.S. Fish & Wildlife Service and National Marine Fisheries Service (FEIS) — 2006. *Final Environmental Impact Statement for Authorization for Incidental Take and Implementation of a Multiple Species Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances*. Green Diamond Resource Company, Del Norte and Humboldt Counties, California

U.S. Fish and Wildlife Service – Arcata Office. *Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California*. 2006.

U.S. Fish and Wildlife Service- Sacramento Office. *Species List*.  
<https://www.fws.gov/office/sacramento-fish-and-wildlife/species>

USGS 7½ minute quadrangle, Camp Meeker and Duncans Mills, CA.

Viessman, Warren, *et.al.*, *Introduction to Hydrology*, Second edition.

Weaver, William E., Hagans, Danny K., Weppner, Eileen, *Handbook for Forest and Ranch Roads*, Mendocino County Resource Conservation District. January 2014.

Wieslander. A. E.; H.A. Jensen. 1945. Vegetation types of California. Berkeley. CA. California Forest and Range Experiment Station. Forest Service, U.S. Department of Agriculture; map.

Williams. D.F. 1986. Mammalian Species of Special Concern. California Department of Fish and Game Report, 112 pp.

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