Section IV

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Section IV – Cumulative Impact Assessment

PART OF PLAN
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

RECEIVED
SEP 22 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

SECTION IV
STATE OF CALIFORNIA
BOARD OF FORESTRY
CUMULATIVE IMPACTS ASSESSMENT

(1) Do the assessment area(s) of resources that may be affected by the proposed project contain any past, present, or reasonably foreseeable, probable, or future projects?

Yes X No

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

The text and pages that follow provide a summary of past, present and future projects. It shows acres logged by silvicultural system and yarding method, percent of the watershed covered and describes the location within the watershed. This THP lies in the 4,628 acre Doty Creek Planning Watershed (1113.810003) (DCPW). Total flood prone area (FPA), also referred to as the floodplain, in the Doty Creek watershed assessment area (WAA) is 245 acres or 5.3%. The THP area contains 211 acres or 86% of the FPA, not all of which is proposed for harvest.

1. Past and Present Projects-

In the past 10 years timber operations have occurred on or were planned for the specified acreage within each of the following CAL WATER planning watersheds within the Watershed Assessment Area (WAA):

Doty Creek: 617 of 4,628 acres, or 13.3% of the watershed is under plan or has been harvested.

Harvesting Within the Flood Prone Area (FPA)

Since the inception of the Forest Practice Act in 1973 most of Little flood prone area stands have been harvested at least once since 1975. This past harvest activity under the selection management system indicates that these stand areas can maintain a harvest reentry cycle of roughly 15 to 20 years. Timber harvesting in the late 1990s to 2000s became problematic for any timberland owner who had flood prone timber areas within their ownership. For various reasons State and Federal agencies were becoming increasingly concerned over perceived potential impacts to watercourses from operating under the Forest Practice Rules at the time; i.e., the regulatory agencies had concerns that the then-existing rules were not sufficiently protective of water resources with a primary focus on anadromous salmonid habitat, health and abundance. Hence, there was a 12-plus-year hiatus of harvesting the FPAs on the ownership until a more restrictive Forest Practice Rule proposal could be developed and approved by the Board of Forestry that had buy-in from all the regulatory agencies. This resulted in the creation of the Anadromous Salmonid Protection Rules of 2009 (ASP). 14 CCR 916.9 (Protection and Restoration of the Beneficial Functions of the Riparian Zone in Watersheds with Listed Anadromous Salmonids). These Rules were created by an interdisciplinary team and vetted through the Board of Forestry's CEQA review process. The Rules are based on recommendations of a paper produced by the Riparian Protection Committee of the Board of Forestry in 2005 titled Flood Prone Area Considerations in the Coast Redwood Zone. This paper was prepared by many experts in the fisheries and hydrology fields. It identified FPA functions and considerations for timber operations on FPAs. It also recommended silvicultural

treatments. The recommendations make a determination that with special care, limited timber operations including tractor skidding, can be conducted in most FPAs without damaging the resources, and that restoration activities including light thinning techniques could improve the functions of the forest as they relate to benefiting habitat for anadromous salmonids with the goal of all operations to lead to recovery of flood prone area functions in impaired watersheds. The ASP Rules for FPAs were designed to implement the restoration recommendations from the 2005 paper.

The total timbered flood prone acreage within the GRT ownership encompasses approximately 2,000 acres of Site I timberlands. These floodplain areas had generally not been harvested since 1999 as the previous owners had determined they would wait until the formulation of the ASP Rules in 2009 prior to submitting FPA THPs. Harvesting on the floodplains did not occur for 12 years or more until the approval and harvest of the Kestrel THP 1-11-087 SON (112 acres selection) in 2014-15 and the pending Dogwood THP 1-15-042 SON (290 acres selection & 52 acres no-cut) which was partially harvested in 2016 (these two plans being predominately located along the South Fork Gualala River); and the Plum THP 1-16-094 MEN (154 acres selection) located along the North Fork Gualala River where harvesting was initiated in 2017. Because of the past decade and a half delay awaiting ASP Rule development, much of the floodplain areas within the GRT ownership are now at or are well past their normal selection harvest reentry schedule of 15-20 years. Thus, harvesting on GRT's FPAs is expected to continue into the next 5 to 10-year planning horizon.

Due to the highly restrictive measures required for harvesting practices in flood prone areas by the ASP Rules, the cumulative impacts of these harvests are expected to be insignificant, as is the intent of the Rules. Sediment delivered from upstream watercourses during flood events that inundates the FPA will either continue to be passed downstream or be trapped by vegetation and deposited on the floodplain as flood water movement slows over the inundated area, allowing both coarse and fine sediments to settle out and drop onto the floodplain surface. The FPA is a net receiver of sediment (acting as a deposition zone) due to this process during flood/inundation events. Erosion and movement of sediment generated from disturbed soils within the FPA is not anticipated under the restrictions of the ASP Rules and other limitations of the THP. Based on analysis of other FPA THPs only 5-10% of the total area in the FPA is operated on by skidding equipment and the low ground impact, flat ground and the roughness created by limbs from felled trees mitigates any potential soil erosion that would cause downstream impacts to water quality and fish habitat. The goals of the ASP Rules are to maintain high canopy levels for stream shading and adjacent streamside thermal temperature control, retain ground vegetative cover and avoid disturbance of critical flood prone area habitat including avoiding wet areas such as abandoned meanders, oxbow lakes and other features that could provide off channel habitat for fish during flood flows. They are also intended to thin the forest to grow larger trees that have more benefit to wildlife, in particular anadromous salmonids due to future recruitment of large wood when these large trees fall into the streams and increased shade canopy keeping water temperatures low and in the favorable range for endangered coho salmon and threatened steelhead trout. In effect, harvest operations are severely constrained to reduce potential impacts to anadromous salmonids and the fluvial functions of the water flows on the FPA and are intended to restore the watercourse functions to benefit the anadromous salmonids. Proper implementation of the ASP restrictions and implementation of this THP and other THPs under the ASP Rules along with the requirements agreed to during the review process makes adverse effects within floodplains in the WAA very unlikely to occur and cumulative impacts to beneficial uses of water are not expected from this operation. The area has been selectively harvested on a periodic basis since the 1950s. The flood plain has not been significantly

RECEIVED
APR 28 2021
COAST AREA
RESOURCE MANAGEMENT

PART OF PLAN

impacted by recent harvests over the past five decades since the implementation of the Z'Berg Nejedly Forest Practice Act of 1973 due to required streamside protection buffers. Past operations that occurred prior to 2000 and had the potential to add impacts to the operations on this THP have had twenty years to stabilize, and we have not found impacts from those operations to be adding to the impacts of this operation to create a cumulative impact to watercourses and anadromous fisheries.

A list of past and present projects in the watershed, by silviculture and logging system and by owner, is included in the THP history tables and maps that follow this section.

2. Future Projects-

Little THP and Future Projects

The harvest planned on the flood plain of the Gualala River under this THP is part of the normal timber management cycle scheduled for the property. The flood plain was originally clearcut at the turn of the 20th century and the old growth tree stumps re-sprouted and grew back into a dense second growth redwood stand. The area has been selectively harvested on a periodic basis since the 1950s. The flood plain has not been significantly impacted by recent harvests over the past five decades since the implementation of the Z'Berg Nejedly Forest Practice Act of 1973 due to required streamside protection buffers. This harvest operation was originally intended to occur on this area in 2001 but was delayed until the Anadromous Salmonid Protection (ASP) Rules were created and added to the Forest Practice Rules in 2009.

ASP rule implementation results in very light and limited harvests in the flood plains of Class I watercourses such as the Gualala River and the main Class I watercourse tributary, the Little North Fork of the Gualala where the plan is located. The ASP Rules require that no timber harvesting occur within 30 feet of the edge of the river within the riparian Core Zone. The Rules also require leaving 13 of the largest trees per acre and 80% overstory canopy within the area from 30 feet out to 150 feet within the Inner Zone (Inner Zone A). Beyond this Inner Zone A, the 13 largest trees per acre and at least 50% overstory canopy must be left in the next zone (Inner Zone B), which extends to the outer edge of the flood prone area at the toe of the slope. There are also strict limitations on road building, skid trail use, slash piling, and a requirement for retention of the larger trees in the flood plain stand with the long-term goal of reducing stand density to 30 to 50 trees per acre of large overstory redwoods. During harvesting, identified wet areas, rare plants, significant depressions with ponded water and secondary overflow channels must be avoided and soil impacts must be negligible so not to affect or alter the hydraulics of flood water as it passes through the floodplain. The ASP Rules are designed to minimize impacts to insignificance. As a result, the harvest is so light that it can be imperceptible within a few years after harvesting. The shady flood plain soils that are disturbed by skidding rapidly revegetate with forbs, ferns, and shrubs, quickly hiding and stabilizing any soil disturbances associated with harvesting. Many precautions are required by the ASP Rules and best management practices included in the THP to avoid disturbance of critical flood prone area habitat. Roughness which is important for slowing water flow and trapping sediment is increased due to limbs added to the forest floor during harvesting. Operations must occur during dry periods to prevent soil compaction. Slash piles must be avoided and slash must be scattered. Water drafting sites in the FPA are to be avoided unless the site is engineered to facilitate properly functioning salmonid habitat and those sites are designed and permitted pursuant to a waste discharge permit from the Water Quality Control Board and a stream alteration agreement from the California Department of Fish and Wildlife. Special features such

PART OF PLAN 126
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

as oxbow lakes, abandoned meanders and other features providing off-channel habitat for fish providing refugia from high flows must be avoided by heavy equipment. To protect these areas any activities that could increase potential for stream diversion or avulsions of flow must be avoided. Deciduous hardwoods are protected in the core area and near stream areas in Inner Zone B as they provide leaf litter that insects graze on and salmonids feed on these insects. Hardwood are also retained as they can be good sources of instream large woody debris that salmonids use for cover from predators and which can alter channel hydraulics to improve sorting of spawning gravels as well as protect stream banks with their root systems.

The goal of the ASP Rules in the flood plains is to grow a forest that improves and restores anadromous salmonid habitat with retention of the largest trees that have the most structure and will provide a high, dense, shade canopy. Eventually the older big trees will topple and fall into the watercourse to provide large woody debris and increase stream habitat complexity, including developing deeper pools, better mixing of spawning gravels and increasing cover from predators for the benefit of anadromous salmonid spawning and rearing. Future entries on these floodplains are expected to occur every 10 to 20 years with light selection harvests that have the goal of restoring the stands to a condition more favorable to providing improved anadromous salmonid habitat.

The restoration type of commercial forestry being practiced on the flood plains by GRT is now becoming more common on redwood lands throughout the state. Similar forest restoration commercial harvesting practices are being used by a number of non-governmental organizations (NGOs) including the Sempervirens Fund and Peninsula Open Space Trust on the San Vincente Redwoods property in Santa Cruz County, the Redwood Forest Foundation on the Usal Forest in Mendocino County, and on a number of private tracts the Save the Redwoods League owns and manages as well as in a partnership with the National Park Service at Redwood National Park (in Humboldt County) called Redwoods Rising where younger stands are managed to decrease stand density and increase heterogeneity of forest structure. The Sempervirens Fund description of the Living Landscape plan for the San Vincente Redwoods states: *Our conservation plan reserves two-thirds of the property for restoration and recovery, so that young redwood trees – akin to a 4-year-old human — can live 2,000 years or more and help re-create a vibrant forest. The plan also identifies limited areas where selective timber harvesting may continue – only with great care, under strict sustainability standards – to generate money for ongoing management and restoration of the property.* https://sempervirens.org/protect-redwoods/success-stories/

GRT's property ownership. In July of 2015 Gualala Redwoods Inc. (GRI) changed ownership, and Gualala Redwood Timber LLC (GRT) was formed. It is GRT's intent to manage the property in a manner similar to GRI's practices. However, GRT has not had time to fully review all aspects of GRI's future management program, and GRT may make changes in the future. References to GRI in the planning history are for informational purposes and for evaluation of past beneficial practices and impacts.

PART OF PLAN

Future harvest acres and projects over the next 5-year planning horizon, excluding the Little THP, that are planned within the watershed that makes up the Watershed Assessment Area (WAA) on GRT are as follows:
(see "Little Future Harvest Plans Map" for this watershed):

Doty Creek Watershed: 435 acres or 9.4% of the watershed area.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Other non-harvest forest management activities can be expected to occur on GRT's ownership in the future. Those projects will or may include:

- **Gravel Mining**. The application process for renewal of the Bed Rock/GRT gravel mining permit on the mainstem South Fork Gualala River and the Wheatfield Fork may be initiated to allow continued mining over the next 10-year permitting period. Averaged annual gravel extractions under the now expired 10-year plan within the Gualala River Watershed on GRT property has been 9,745 cubic yards per year. The gravel mining does not directly affect the WAA of this THP as this plan is upstream of the South Fork Gualala

- **Road Rehabilitation**. Watershed restoration work and road storm proofing is an ongoing activity on GRT lands. In the last 15 years nearly 60% of the ownership's road system has been stabilized to storm proof conditions in association with CDFW habitat improvement grants to reduce potential sediment delivery to the streams within the Gualala River Watershed. This has been accomplished through stream crossing replacements and improvements, removal of legacy earth fill crossings and undersized culverts, storm proofing roads by reconstruction to an outsloped running surface, and hydrologically disconnecting the road surface from nearby watercourses. In all, approximately 295,000 cubic yards of sediment have been prevented from being delivered to the tributaries and the main watercourses of the Gualala River and have been retained on the hillslopes through stabilization work on GRT lands. Within the next 10 years GRT will continue to address treatment of the remaining 40% of its road system through grant funding or as on-site project mitigation through the company's timber harvest management program.

  Fish Habitat Improvement. GRT plans to continue its grant funded work with the Gualala River Watershed Council (GRWC), the California Department of Fish and Wildlife, and NOAA Fisheries to improve the on-property fish habitat with additional instream large woody debris placement. To date it is estimated that more than 111 log truck loads of large wood have been placed in the fish bearing streams on GRT property within the Gualala River Watershed. This work was primarily accomplished through State grant funding and company cost share, and to a limited extent as off-site fish habitat mitigation related to the gravel extraction and mining permit. In 2018 eleven (11) large trees (nearly 14 MBF) were placed in the North Fork of the Gualala River by use of the Option 'v' process in the ASP Rules that allows for site-specific restoration work within the watercourse channel on the Plum THP (1-16-094 MEN). GRT expects it will continue this work into the future in association with GRWC, California Department of Fish and Wildlife, the North Coast Regional Water Quality Control Board, and NOAA Fisheries.

All this past and expected future restoration and stabilization work as addressed above has been evaluated through monitoring efforts by the GRWC and found to be contributing significant improvements to the Gualala River Watershed in terms of reducing sediment, increasing fish habitat associated with large wood, and monitoring changes to stream characteristics at permanent monitoring locations. The State and Federal regulatory agencies support continuing this work into the future as the work is resulting in measurable fish and water quality improvements to the Gualala River Watershed, the WAA and the THP area.

PART OF PLAN

Timber Harvest Scheduling

Harvesting, for practical reasons due to historical past harvest entries, access availability, equipment and manpower

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

mobilization and staging, is often concentrated in one watershed for a period of time and reduced in another watershed during that same time period. This varying harvest intensity must be addressed in a cumulative effects analysis. In the assessment of potential cumulative effects from harvesting, percentage of watershed acres harvested is a not a good indicator by itself. For example, if all silviculture were even-aged then one would expect on a sixty-year rotation to only harvest 16.7% of a watershed within a ten-year period due to adjacent harvest unit constraints imposed by the Forest Practice Rules. However, if the landowner were to fully engage in uneven-aged silviculture over the entire watershed one could expect to selectively harvest 50 to 100% of the acres over a ten to fifteen-year period. Where there is a mixture of silvicultural prescriptions used within a watershed, the areas harvested in a ten to fifteen-year period become more complicated to decipher. This also does not take into account the fact that these are not fully regulated stands but have been harvested in concentrations of activity in the past which have resulted in the majority of these stands becoming harvestable at approximately the same time in many cases. This pattern results in decades with higher harvest rates over an area followed by decades in which little to no harvesting occurs, so potential impacts can fluctuate periodically.

At the present rate of harvest and because of harvest unit adjacency rules it is likely that many of the stands on the landowner's property will not be harvested until they are many decades older than the rules require for minimum stand age using even-aged management. Much of the ownership will continue to be managed using unevenaged selection silviculture, and older stands of mature timber will continue to exist because of a number of restrictions and considerations including watercourse protection rules, geological hazard set-asides, northern spotted owl habitat protection, as well as other plant and animal retention areas being left across the ownership.

Background and Conclusion Statement

The Timberland Productivity Act of 1982 restricts the use of lands zoned Timberland Production Zone (TPZ) to the growing and harvesting of timber and compatible uses and establishes a presumption that timber harvesting is expected to and will occur on such lands. The RPF and the Director (Cal Fire) are to include the above legal consideration regarding project feasibility while giving consideration to measures proposed to reduce or avoid significant adverse impacts of THPs on lands zoned TPZ. On TPZ lands, per 14 CCR Section 898 of the Forest Practice Rules (FPR), the harvesting per se of trees shall not be presumed to have a significant adverse impact on the environment. Per the same rule section, cumulative impacts are to be assessed based upon the methodology described in Board Technical Rule Addendum Number 2, Forest Practice Cumulative Impacts Assessment Process and shall be guided by standards of practicality and reasonableness. After considering the Rules of the Board and those mitigation measures proposed in the plan, the RPF is to indicate whether the proposed timber operation would have any significant adverse impact on the environment. Implementation of the FPRs through the multi-agency review process, is intended to mitigate the environmental impacts of a THP to a less-than-significant level. Once done on an individual THP (project) basis, an evaluation needs to be conducted to determine whether multiple projects across the landscape would constitute or combine to create a cumulative adverse impact on the environment.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

It is important to recognize that cumulative environmental effects can be either adverse or beneficial, and respectively significant or insignificant. Guidance under Addendum No. 2 of the FPRs is intended to meet the requirements of CEQA Guidelines CA Code of Regulations section 15130. **Consistent with section 15130(a)(2), this project, when considered with other past, present and future projects will not have incremental cumulative impacts which could be considered significant. The facts and analysis supporting this conclusion that the cumulative impact is less than significant is set forth below.**

There are several strategies to deal with potentially negative environmental impacts in the implementation of forestry projects:

Avoidance
- Avoid the impact altogether by not taking action or part of the action.

Minimization
- Minimize impacts by limiting the degree or magnitude of the action and its implementation.

Mitigation
- Repair, rehabilitate, or restore degraded environmental resources.

After it is determined which of these strategies to employ in any given situation, there are a number of practices to achieve avoidance, minimization, or mitigation. They are:

Best Management Practices
- Employ a predetermined suite of management practices that are known to avoid or minimize adverse impacts.

Site-Specific Practices
- Employ individual or a combination of practices, or techniques, that are tailored to avoid, minimize, or mitigate adverse impacts that are specific to the project and/or its implementation.

On-Site Mitigation
- Mitigation that is implemented within the footprint of the proposed project or is very closely associated with the project (e.g., correcting road points along an appurtenant road).

PART OF PLAN

Off-Site Mitigation
- A mitigation that is implemented outside the project area. The mitigation measure can be at a far-removed location but is expected to address any unmitigated on-site impacts as an off-set to those remaining at the proposed project location (e.g., mitigation banking).

The methods and practices used during the design and implementation of the present project to address cumulative effects include all the above, and selection of the final suite of practices varies by the resource requiring protection. Selection of final practices employed is an iterative process with feedback and adaptation as the project is developed and reviewed. Drawing upon the final practices to be implemented is not a linear process, but a circular one that

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

may have to be done and redone several times during the course of project design. Often the end goal of the project proponent is not only to achieve the project objective(s) while preventing cumulative environmental effects, but to achieve a positive environmental outcome where feasible. For Flood Prone Area THPs like this one, the silvicultural practices required by the ASP Rules are intended to do just that.

The cumulative impacts analysis is both a qualitative and quantitative process. It is based on the amount of information that is available at the time of project application and is built upon a level of perceived risk. Every attempt is made to compare the current condition with that of the desired outcome on the affected resource. From this comparison, one can gain an understanding as to whether a cumulative impact from past, present, and future projects will occur, and whether it can be expected to improve or degrade the present site and/or assessment area condition.

The cumulative impacts assessment provided here in Section IV, with its developed suite of mitigation measures that are carried over to the operational portion of the plan (i.e., Section II), is our best effort to meet the intent of the Forest Practices Act and its Rules, to comply with the requirements of CEQA, and to provide the most scientifically credible impacts analysis of forest projects that are implemented on lands zoned for timber production in the State of California.

Analysis of Recent THPs on GRT lands within the WAA:

There have not been any recent plans harvested within the WAA.

Maps and documents that follow are:

- Map - Little THP Location Within the Gualala River Watershed
- Map - Doty Creek Watershed Harvest History
- Map - Doty Creek Watershed Potential Future Harvests
- Past, Present, and 5-Year Foreseeable Future Project Assessment Tables,
- Map - Little THP Cumulative Impacts Assessment Areas Map
- Map - Flood Prone Area Map

PART OF PLAN

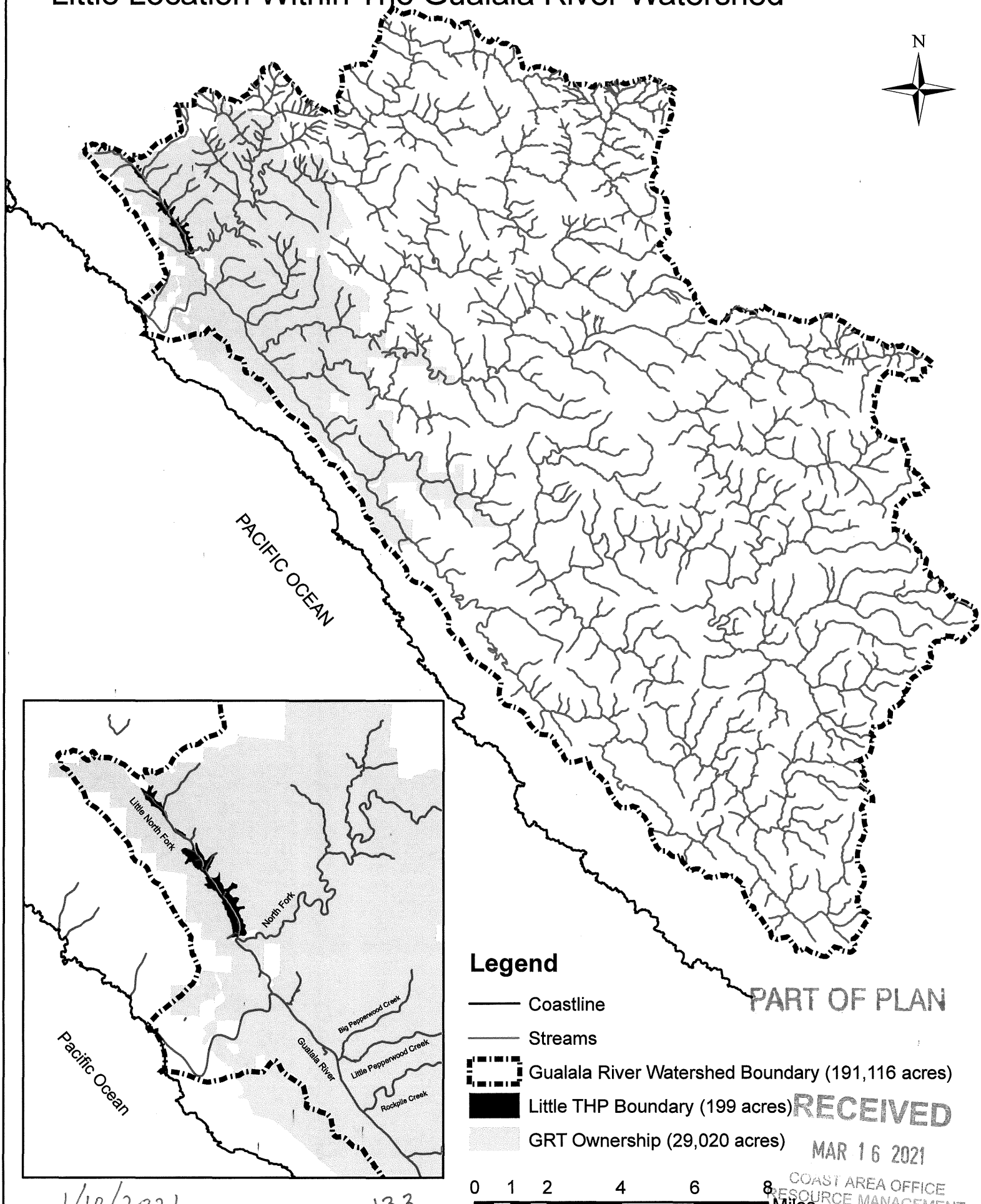
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Little THP
Past, Present, and 5-Year Foreseeable Future Project Assessment

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Little Location Within The Gualala River Watershed



PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/2021

133

Little THP
Doty Creek
Watershed History Map

Date: 4/26/2021

Sec 4, 9, 10, 14, 15, 23
T11N R15W M.D.B.M.

N

1:33,540

CLCT=Evenaged
STRS=Evenaged
GSLN=Unevenaged
SLCN=Unevenaged
TRAN=Unevenaged
VRTN=Special
NHRV=no harvest

CALWNUM 1113.810003

RECEIVED
APR 28 2021
COAST AREA
RESOURCE MANAGEMENT

1-12-078-MEN VRTN
1-12-078-MEN TRAN
1-98NTMP-025 UNEV
1-20-150-MEN SLCN
1-20-150-MEN SLCN
1-20-150-MEN CLCT
1-20-150-MEN SLCN
1-20-150-MEN STRS
1-20-150-MEN SLCN
1-20-150-MEN TRAN
1-20-150-MEN TRAN
1-20-150-MEN TRAN
1-20-150-MEN SLCN
1-20-150-MEN STRS
1-08NTMP-009 GSLN
1-12-029-MEN CLCT
1-11-105-MEN STRC
1-11-105-MEN CLCT
1-11-105-MEN NHRV
1-11-105-MEN SLCN
1-16-094-MEN SLCN

5 4 3 2 1 10 11 12 13 22 23 24

Legend

All Doty creek NTMPs
- 1-08NTMP-009
- 1-98NTMP-025
- Doty Creek Watershed

Doty creek THPs since 2008
- 1-11-105-MEN
- 1-12-029-MEN
- 1-12-078-MEN
- 1-16-094-MEN
- 1-20-150-MEN
- Little THP Boundary

Hydrography
- Class I
- Class II L
- Class II S
- Class III
- Property Boundary

contour interval 40'

PART OF PLAN

134

Little THP
Doty Creek
Potential Future THPs

Date: 4/26/2021

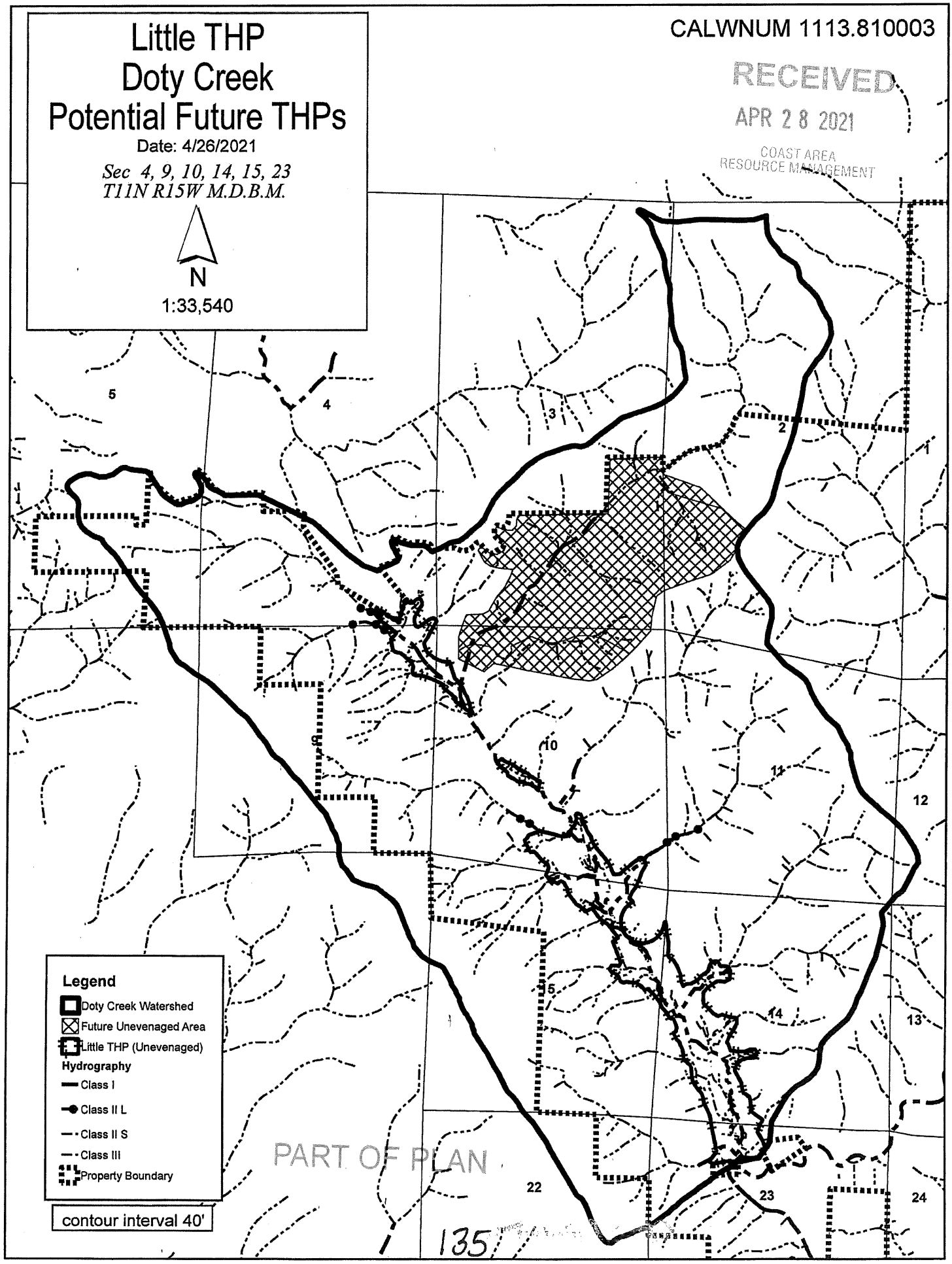
Sec 4, 9, 10, 14, 15, 23
T11N R15W M.D.B.M.

N

1:33,540

CALWNUM 1113.810003

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT



Legend

- Doty Creek Watershed
- Future Unevenaged Area
- Little THP (Unevenaged)

Hydrography

- Class I
- Class II L
- Class II S
- Class III
- Property Boundary

contour interval 40'

PART OF PLAN

135

DOTY CREEK PLANNING WATERSHED SILVICULTURE HISTORY FROM 2008-2021 **4630 acres**

Past and Present Projects:

Silviculture	Acres	% of PWS	Silviculture Category
Clearcut	222	4.79%	evenaged
Seed Tree Removal Step	43	0.93%	evenaged
variable retention	1	0.02%	special
Selection, transition	490	10.59%	unevenaged
Sub Total:	756	16.3%	

Future Projects:

Silviculture	Acres	% of PWS	
Clearcut	0	0.0%	evenaged
Selection	435	9.4%	unevenaged
SRS	0	0.0%	evenaged
Sub Total:	435	9.4%	

	Acres	% of PWS
Total:	1191	25.7%

Last ten years % of watershed unevenaged	% of watershed evenaged	% of watershed special	% of watershed intermediate	totals
10.6%	5.7%	0.0%	0.0%	16.3%

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/2021

DOTY CREEK PLANNING WATERSHED THP HISTORY FROM 2008 - 2021 **4,630 acres**

Past and Present Projects:

Year	THP Num	Silviculture	Yarding	Landowner	Acres	% of PWS	silviculture category
1998	1-98NTMP-025	Group Selection		Merle & Patricia Schreiner	50	1.08%	unevenaged
2008	1-08NTMP-009	Group Selection		Bower Limited Partnership	1	0.03%	unevenaged
2008	1-08NTMP-009	Group Selection	Cable System	John & Margaret Bower	11	0.24%	unevenaged
2008	1-08NTMP-009	Group Selection	Tractor or Skidder	Bower Limited Partnership	2	0.03%	unevenaged
2008	1-08NTMP-009	Group Selection	Tractor or Skidder	John & Margaret Bower	65	1.41%	unevenaged
2011	1-11-105-MEN	Clearcut	Cable System	Gualala Redwoods Inc	37	0.80%	evenaged
2011	1-11-105-MEN	Clearcut	Tractor/Cable option	Gualala Redwoods Inc	40	0.87%	evenaged
2011	1-11-105-MEN	STRS	Tractor/Cable option	Gualala Redwoods Inc	10	0.22%	evenaged
2011	1-11-105-MEN	Selection	Tractor/Cable option	Gualala Redwoods Inc	43	0.93%	unevenaged
2012	1-12-029-MEN	Clearcut	Cable System	Gualala Redwoods Inc	56	1.21%	evenaged
2012	1-12-029-MEN	Clearcut	Tractor/Cable option	Gualala Redwoods Inc	72	1.56%	evenaged
2012	1-12-078-MEN	Transition	Tractor or Skidder	Mendocino Redwood Co	5	0.10%	unevenaged
2012	1-12-078-MEN	Variable Retention	Tractor or Skidder	Mendocino Redwood Co	1	0.03%	special
2016	1-16-094-MEN	Selection	Tractor or Skidder	Gualala Redwood Timber LLC	0.25	0.01%	unevenaged
2018	1-18-095-MEN	Selection	Tractor or Skidder	Gualala Redwood Timber LLC	199	4.30%	unevenaged
2019	1-19-098-MEN	Selection	Tractor or Skidder	Gualala Redwood Timber LLC	23	0.50%	unevenaged
2020	1-20-150-MEN	Clearcut	Cable System	Gualala Redwood Timber LLC	17	0.37%	evenaged
2020	1-20-150-MEN	Selection	Cable System	Gualala Redwood Timber LLC	18	0.39%	unevenaged
2020	1-20-150-MEN	Selection	Tractor or Skidder	Gualala Redwood Timber LLC	37	0.80%	unevenaged
2020	1-20-150-MEN	STRS	Cable System	Gualala Redwood Timber LLC	29	0.63%	evenaged
2020	1-20-150-MEN	STRS	Tractor or Skidder	Gualala Redwood Timber LLC	4	0.09%	evenaged
2020	1-20-150-MEN	Transition	Cable System	Gualala Redwood Timber LLC	5	0.11%	unevenaged
2020	1-20-150-MEN	Transition	Tractor or Skidder	Gualala Redwood Timber LLC	31	0.67%	unevenaged
				Sub Total from 2008 to 2021:	757	16.4%	

Foreseeable Future Projects:

Year	THP Num	Silviculture	Yarding	Landowner	Acres	% of PWS	silviculture category
next five years	no number	selection	tractor	Gualala Redwood Timber LLC	435	9.40%	unevenaged
				Sub Total for next five years	435	9.40%	
				Total:	1192	25.7%	

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

137

1/10/2021

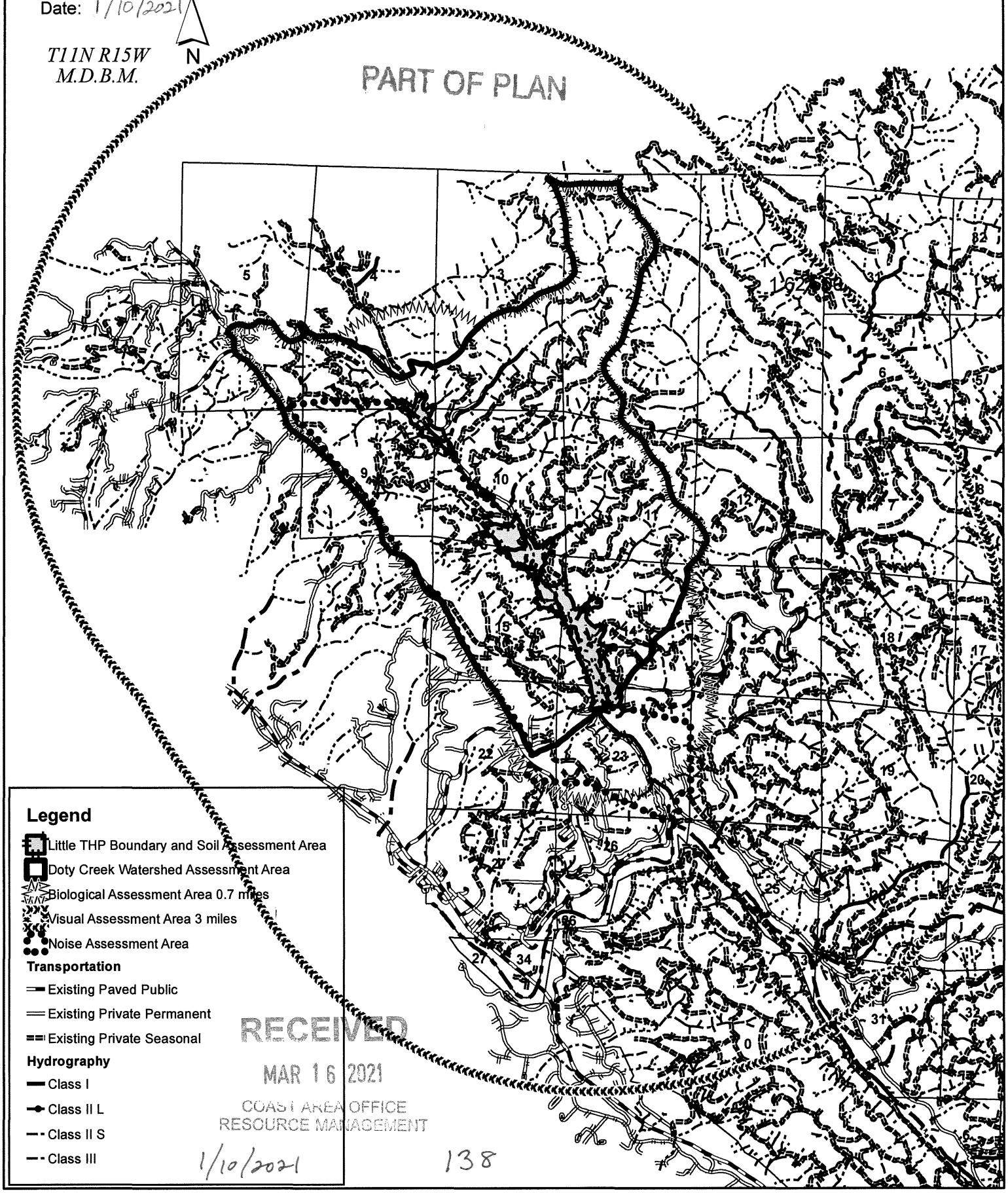
Little THP Assessment Areas Map

Date: 1/10/2021

T11N R15W
M.D.B.M.

N

PART OF PLAN



Legend

- Little THP Boundary and Soil Assessment Area
- Doty Creek Watershed Assessment Area
- Biological Assessment Area 0.7 miles
- Visual Assessment Area 3 miles
- Noise Assessment Area

Transportation

- Existing Paved Public
- Existing Private Permanent
- Existing Private Seasonal

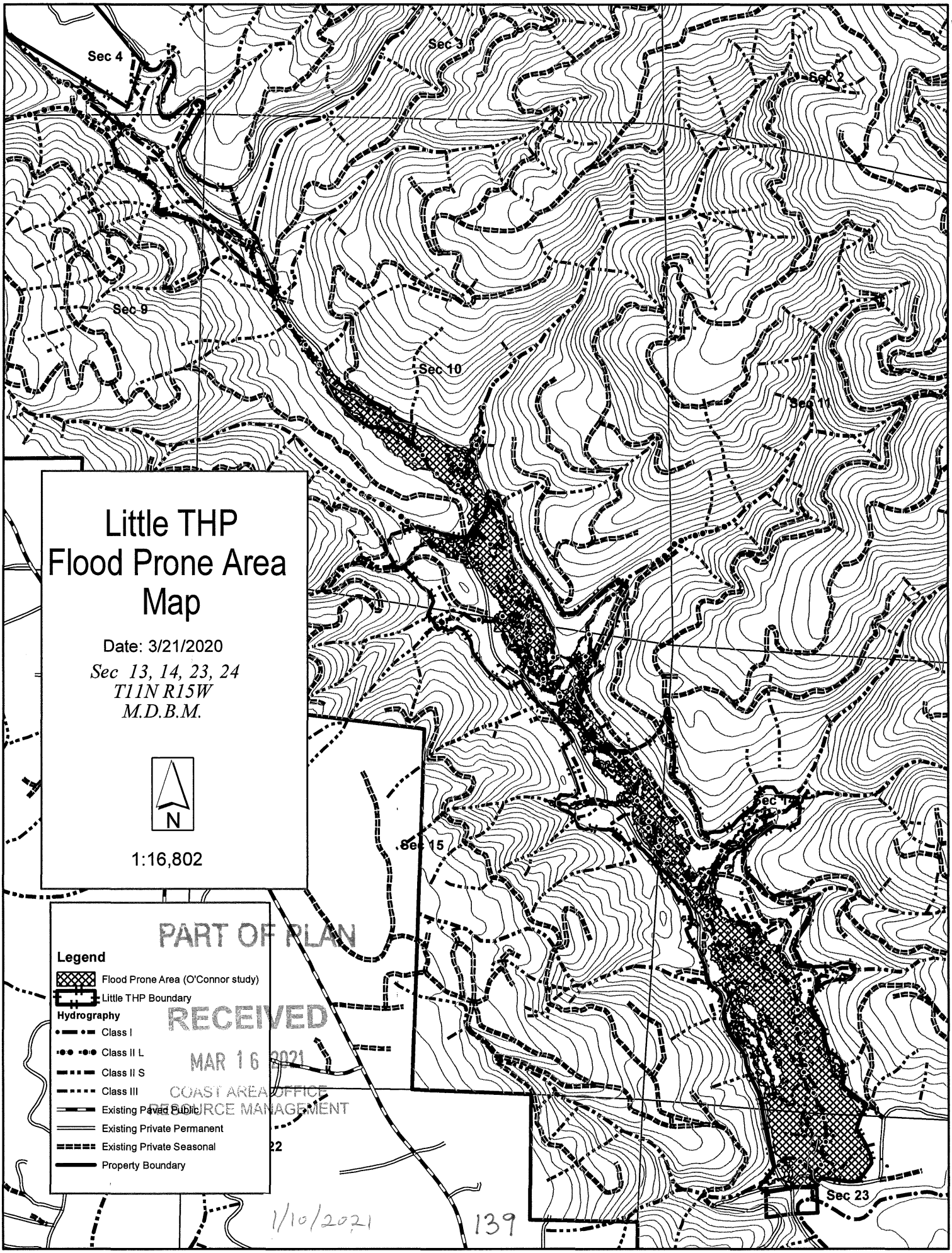
Hydrography

- Class I
- Class II L
- Class II S
- Class III

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/2021

138



PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/2021

139

PART OF PLAN

The resources that are possibly affected by the projects listed above are Watershed, Soil, Biological, Recreational, Visual, Noise and Traffic.

The planned levels of harvesting, when mitigated with the procedures prescribed by the rules, will not create significant adverse cumulative impacts to these assessment areas.

(2) 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, describing their locations, impacts and affected resource subject(s).

The following cumulative effects analysis references the following documents: the Gualala River Watershed Council (GRWC) Monitoring Plan Report 2000-2005 (GRWCMPR) and the North Coast Watershed Assessment Program (NCWAP March 2003). The GRWCMPR is the most comprehensive analysis available and summarizes the data that has been collected as part of the Gualala River Watershed Monitoring Program Plan and includes a Quality Assurance Project Plan (QAPP) vetted by the California Department of Fish and Wildlife and the North Coast Regional Water Quality Control Board. It is part of the ongoing development of a Watershed Management and Enhancement Plan (WMEP) for the Gualala River Watershed. This monitoring plan was funded by grants from the State Water Resource Control Board (SWRCB) 319(h) program and the California Department of Fish and Wildlife (CDFW) SB271 program.

The GRWCMPR and NCWAP reports were published in 2006 and 2003 respectively and contain the most comprehensive and scientifically valid information to date regarding existing conditions and how those conditions relate to past land use practices. NCWAP was developed through cooperative efforts with landowners, government agencies and the public. The Gualala River Watershed Technical Support Document (GRWTSD) prepared by the North Coast Regional Water Quality Control Board in 2001 as supporting documentation for the TMDL analysis by the EPA was also reviewed for this cumulative impacts analysis. The primary objective of the GRWTSD is to identify and quantify sources of sediment in a way that allows a relative comparison of those sources and to provide information for non-point source erosion control measure prioritization and implementation. Data sets and reports including on-going monitoring information for the Gualala River are not common for North Coastal California rivers except for Caspar Creek Watershed at Jackson State Forest, which is an experimental watershed with numerous long-term studies. GRT and the State Agencies reviewing THP impacts in the Gualala River are very fortunate to have this data which shows stream habitat trends as they relate to anadromous fisheries. These studies have been useful in determining current stream conditions and priorities for improvement of fisheries habitat.

Additional references are THP reports prepared for GRI by fisheries experts, in particular a report by fisheries biologist Dennis Halligan of Natural Resources Management Corporation (Halligan 2000). Mr. Halligan's report contained valuable analysis of the available watershed information and some of his conclusions are included in this analysis.

In addition, Mr. Halligan was contacted recently (June 2019) and an email from him set out the concerns associated with operations in the flood prone areas. Basically, he reiterated the critical value of flood prone areas to salmonids, that operations on these areas during dry periods will have no direct impacts to salmonds, and that certain activities,

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

most of which are incorporated into the plan, will mitigate indirect impacts. Finally, he stated that "The FPRs WLPZ Rules for anadromous streams were created to mitigate THP-related impacts on anadromous fish species to a less than significant level. It is incumbent on CalFire to support and defend their Rules."

Watershed analysis is currently being conducted by the Gualala River Watershed Council (GRWC). The GRWC stream monitoring program revisits specific stream reaches on a periodic basis to evaluate trends in water temperature, stream channel characteristics such as depth, width, and thalweg, riparian shade cover, and presence and absence of anadromous salmonids. GRWC crews have been annually monitoring stream reaches since the two reports sited above were published in 2003. GRT is continuing these monitoring programs on its property in the Gualala River Watershed to monitor trend data.

Past Watershed Impacts-

Prehistorically, the greatest impact to the watercourses within the WAA was landslide activity. This resulted in the delivery of sediment into watercourses through large mass wasting events over the course of geologic time. Tim Best, a consulting State Licensed Engineering Geologist studied the Gualala Redwood property for unstable areas and wrote a report on his findings in 1998. This information was updated and reassessed in 2006 by Mr. Best. In that analysis he quantified landslides by time period using aerial photos. Smaller landslides that are found during THP preparation are added to the unstable area database for the property. This unstable area database can be found on the pages titled "Landslide Sites" in Section V (misc. addendums) (THP page 238.1). All known landslides, both historic and prehistoric, are listed on these pages. Although prehistoric slides are not considered "past land use activity" they have been included in the database to be assessed in terms of potential additional watershed impacts.

Historically, timber harvesting (with its associated activities) and road building for timber purposes have been the human activities occurring within this watershed with the greatest potential for impacting watershed resources. The first logging in this watershed occurred approximately 100+ years ago with steam donkeys dragging logs to load onto railroads. Evidence of old railroad spur lines are found along the main watercourses including the North Fork Gualala. The logging patterns in the earlier part of this century made heavy use of draws and watercourse channels as skid and haul roads. Around the early 1940's, timber harvesting methods began to be converted to tractor logging. The seasonal roads within the planning watersheds were sometimes constructed on the old railroad grades. During the early tractor logging operations and up to the early 1970's, roads and skid trails were mostly constructed by cut and fill methods on the slopes and in and around watercourse channels to provide a means to remove the timber. In some cases, water was diverted out of natural watercourse channels or was channeled under the skid trails and roads by means of Humboldt crossings using log chunks placed in the creek with an earth cap as fill material. Between 1952 and 1965 aerial photos show that extensive harvesting took place in the inland portions of the Gualala River Watershed including this THP area, and existing age classes of trees indicate that the majority of harvesting of old growth trees on this property took place earlier (1890-1910), probably because of the property's close proximity to the coast.
Within the assessment area these old fills at skid trail and road crossings have long since been washed out, stabilized, or replaced by more storm proofed crossings. Eroded sediments have mobilized through and out of the Gualala watershed or have become deposits on flatter downstream reaches of the Class I and II watercourses. The majority of the sediment effects associated with the railroad and tractor logging took place before the modern Forest Practice Rules that came into effect in the mid-1970's. Long term impacts from the old logging have been shown by the GRWC stream monitoring data to decrease over time following the activities. Over time, impacted watercourse channels have reached greater levels of stability as sediments deposited from the pre 1970's logging have moved downstream and

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

stream banks have revegetated, though there is still likely to be some watercourse bank erosion where old fills and soil depositions are still actively eroding due to downcutting or bank cutting. These long-term sediment impacts are still taking place upstream of this THP area in the WAA on steeper slopes, but on the THP area here (which is mostly flat) there are no known sediment discharge sites. Natural inner gorge slumping will be an on-going process. Known specific present and past impact locations in the WAA are described in the "Landslide Sites" (THP page 238.1) and "Completed Road Work" document summaries presented in Section V of the THP (THP page 241). Also see THP Road Work database in Section II (THP page 63) with the accompanying maps which describes road and crossing stabilization measures for this THP.

PART OF PLAN

Recent Past and Present Watershed Impacts

Negative Impacts- The recession of 2008 and the collapse of the housing bubble caused a dramatic reduction in timber harvesting across the state with many mills closing and remaining mills working at reduced rates. This was likely a short-term state of affairs, however medium-term trends (i.e. over the last couple of decades) show a steady decline in THPs submitted and acres and volume being harvested statewide.

Not all negative environmental impacts can be attributed to pre-Forest Practice Rule operations. Roads have continued to be constructed during the last forty years (although often the reason has been to switch from tractor logging, which requires roads at the bottom of slopes, to cable logging which needs roads at the top of slopes). Even with much more restrictive Rules regarding the placement of roads and the construction and maintenance of watercourse crossings, new roads can still have potential sediment impacts if they are not designed properly to handle peak flow events or if the crossing is not properly sized and maintained. Culverts have the potential to create negative impacts through failure and the diversion of water onto unstable or erodible ground unless critical dips are placed to prevent diversions.

Surface erosion may occur where bare ground has been exposed and waterbars potentially can fail on roads and skid trails if not constructed properly or maintained. Prior to the 1973 Forest Practice Rules (FPR), skid trails were frequently built on steep slopes by large tractors and were constructed by pushing fill onto the steep slope below the trail. Some of these skid trails have had fill failures over time and usually during peak rain events as fill materials became saturated. Many of these skid trails and the associated fill failures have revegetated with thick conifer reproduction and potential fill failure has since stabilized or fill leaving the slopes has settled out onto lower gradient reaches. More of a problem than the pre-FPR road and skid trail fill failure is the concentration and diversion of the surface flow of water (and sometimes subsurface flow) onto hill side slopes creating eroded rills and gully erosion. Diversions of watercourses on pre-FPR constructed roads and skid trails have also been a major source of human caused erosion in the past.

The practice of storm-proofing roads by outsloping road surfaces and installing rolling dips, armoring watercourse crossings, replacing culverts with rock armored fords or dips whenever feasible has become a standard industry practice in the last decade. "Gualala Redwoods Inc. has storm-proofed more roads as a percentage of their entire road system than any other north coast timber company" (personal comm.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Pacific Watershed Associates). To date nearly 60 percent of GRT's management service roads and old legacy roads have been treated to reduce erosion and/or to prevent any measured sediment delivery to a watercourse. In the Doty Creek Planning Watershed 81.6 percent of the landowner's roads have been hydrologically disconnected (see report THP page 242). GRT intends to continue this road storm-proofing program for the remainder of the roads that have not yet been treated. Storm-proofed roads can withstand the peak flow events that in the past would wash out culverts and road fill or overtop waterbars and inside ditches. This new way of designing or reconstructing road systems is having a significant calculable positive effect. Breached waterbars resulting in deep road gullying are no longer a common site on roads that have been storm proofed. Inside ditches that need constant maintenance no longer exist on these roads and washed out culverts are becoming a rarity. This watershed improvement activity within the Gualala River Watershed on GRT lands is correcting decades of man caused problems, and it often has a noticeable affect the first winter after storm-proofing with associated streams running clearer of sediment.

Other potential impacts that have occurred within these watersheds in the recent past have been 1) the increased use of even-aged silviculture over uneven-aged silviculture by the landowner, which has potential watershed impacts, both negative and positive, 2) trespass by all-terrain vehicles and motorcycles using roads and skid roads in the winter period which impacts the road system by damaging waterbars and creating
small gullies that channel water down the roads, 3) climate change is a serious potential impact, the effects of which are more intense storms and wildfires that can increase soil erosion, and since the main stem of the Gualala River is in the upper range of temperature that is suitable for salmonids, a warmer climate could have serious negative impacts on salmonid health and regeneration, and 4) the potential conversion of land to other uses such as housing or vineyards is an issue in this watershed as societal and economic pressures increase.

PART OF PLAN

Positive Impacts

1) The landowner is continuing to evaluate and rehabilitate their entire road system in order to offset potential sediment impacts that result from their timber harvesting activities and to stabilize old erosion sites as well as disconnect the road surfaces and drainage ditches from watercourses which greatly reduces sediment delivery to the main Gualala River and the North Fork Gualala River. From the period 2003 to 2018 GRI and GRT have improved/stabilized 55.4% of their road system on their lands in the Gualala River Watershed at a cost of $3,433,000.00, not including grant money, and prevented at least 295,000 cubic yards of sediment from being delivered into watercourses. The average cost of road upgrading has been $17,900.00 per mile. GRT has an ongoing goal of assessing their remaining road system over the next ten years and upgrading all roads to a storm-proofed condition over the next twenty years as money is available. In addition, roads are inspected annually and most road erosion sites that develop during the winter that are found that are accessible are repaired immediately so that small erosion problems do not develop into bigger erosion problems.

2) The Threatened and Impaired Watercourse Forest Practice Rules implemented in 2001, and the Anadromous Salmonid Rules of 2009 have resulted in significant amounts of sensitive areas being designated as no-harvest areas for resource protection. Additionally, WLPZs now have higher canopy and Large Woody Debris (LWD) retention requirements. These non-operations areas include Core Zones within

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Class I watercourse floodplains, areas adjacent to Class I watercourses that contain listed salmonids, inner gorge areas, unstable areas, areas for wildlife protection, areas for botanical protection, archaeological sites, and areas on steep slopes near Class I and Class II watercourses. Many areas with difficult access near Class I watercourses end up as virtual no-cut zones because of high canopy retention standards. These areas will continue to age and develop into mature successional stands. Many of these areas on the GRT property already contain a stand cohort that is 100 plus years old. These protection measures have been developed by interdisciplinary teams and are constantly being assessed for effectiveness. These additional retention areas located in sensitive watercourse and other zones reduce impacts to these areas from heavy equipment use and timber removal.

3) Wildlife and botanical surveys that have occurred for harvest plans have resulted in the discovery of many rare plants, listed birds, and listed frogs that otherwise would not be protected. Numerous areas designated for tree protection have been flagged out or designated as no-cut as a result of these surveys to retain and protect habitat for listed species.

Other Impacts

Surface gravel mining of the open bars above the Gualala River summer flow may have an impact on the river but its extent is unknown as to whether the impact is positive or negative. Gravel mining opponents argue that any activity in the stream channel is potentially disruptive by destabilizing stream banks, exposing areas of fine sediment, damaging riparian vegetation or in some cases affecting the water table. Gravel mining advocates argue that removal of gravel actually enhances downstream habitats by reducing the oversupply of gravel in depositional reaches of the river thereby reducing the chance of flooding, increasing pool depth and creating greater channel diversity. State and County permitting requires that measurements are taken annually to ensure that gravel bars are replenished each year and in low replenishment years gravel removal is reduced or stopped altogether.

PART OF PLAN

Potential Biological Impacts-

The major biological impacts in the Biological Assessment Area, which includes all of the WAA and is dominated by timberland that has been under active management for the last 100 years, would primarily be one or more of the following: 1) erosion of the soil with the resulting loss of forest productivity and the sedimentation of the watercourses affecting downstream fisheries and instream habitat for aquatic species; 2) change of habitat for certain groups of species through the conversion of existing eighty to one hundred year old timber stands to younger age classes and a reduction in the diversity of hardwood tree species as forest management favors growth of conifers; 3) the loss of snag recruitment trees and the unintentional knocking down of existing snags (snags being important for a number of species); 4) disturbance of animal species in the summer time through logging and trucking activity; and 5) directly killing certain slow moving or non-mobile plant and animal species through falling, skidding, logging, trucking and road building activities.

Potential Offsetting Actions to Potential Impacts

1) Forestry related: Increased canopy retention and large woody debris standards near watercourses along with no-cut areas implemented for a number of reasons (i.e. avoidance of unstable areas, wildlife protection, botanical protection,

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

archaeological site avoidance, etc.) will result in increasingly older forests adjacent to watercourses and in random locations, resulting over time in development of late seral corridors and islands. As this trend continues it is likely that a significant amount of the property, estimated at 20%, will eventually be forests with late seral type characteristics with only light selection taking place into the future. Flood plains are part of this forest type due to the restrictions of the ASP Rules. These areas are often adjacent to linear features that are contiguous with other no-cut areas and have an added benefit of creating wildlife corridors and islands across the property.

2) Evenage management results in the temporary establishment of low growing vegetation that is different from vegetation in a closed canopy forest, and this shrubby and brushy vegetation increases forage and habitat for a different set of wildlife species and creates edge effect along margins of evenaged units. The impacts of evenaged management are temporary in nature and tend to mimic natural disturbance events such as fire that create variations in age, size and structure of forests. Openings and gaps created by timber management are where rare plants are typically found on the property, and this is often a result of these species preferring recent soil disturbance where invasive and non-native plants have not yet become established.

3) The 2009 ASP Rules expanded Watercourse and Lake Protection Zones with increased canopy retention requirements and increased Large Woody Debris (LWD) retention requirements adjacent to salmonid streams which is expected to result in cooler stream temperatures favorable to salmonids and more structure in the streams which increases pool depths, spawning habitat, and provides cover from predators. Those protection measures have been in place for ten years and the upstream Plum THP has recently been harvested under these measures which should result in improved salmonid habitat and increased incidence of large wood entering the watercourse as the largest trees have been left where they are in a position to naturally fall across the watercourse.

4) GRT is also involved in the facilitation of ongoing stream reach, stream cross sectional, and LWD placement monitoring being conducted annually by the Gualala River Watershed Council (GRWC) on GRT's property in the WAA and within the Gualala River Watershed. This information is used to better understand the condition of and limiting factors for anadromous salmonids, and to help design restoration and rehabilitation projects that can offset any potential impacts that result from their timber harvesting activities.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Will the proposed Project, as presented, in combination with Projects, and Reasonably Foreseeable Probable Future Projects identified in items (a) and (b) above, have a reasonable potential to cause or add to significant adverse Cumulative Impacts in any of the following resource subjects?

Resource Subjects	Yes after mitigation (1)	No after mitigation (2)	No reasonably Potential significant adverse Impacts (3)
A. Watershed		X	
B. Soil Productivity		X	
C. Biological		X	
D. Recreation			X
E. Visual			X
F. Traffic			X
G. Greenhouse Gases (GHG)			X
H. Wildfire Risk and Hazard			X
I. Noise			X

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.

Current harvesting and forest management practices in combination with adherence to regulations of the Forest Practice Rules and beneficial actions developed in this THP should reduce the risk of significant adverse cumulative impacts to the resources. See below for specific beneficial actions.

Project Description –For a description of the current project see the beginning of Section III (preceding the impacts analysis).

PART OF PLAN

RECEIVED
APR 28 2021
COAST AREA
RESOURCE MANAGEMENT

V. 4/26/2021

A Description of the Assessment Area used for each Resource Subject

WATERSHED ASSESSMENT AREA (WAA):

Assessment Area: The watershed assessment area is the 4,628 Doty Creek Planning Watershed (1113.810003) (DCPW).

Total acreage of the assessment area is 4628 acres which is 2.4 percent of the total Gualala River Watershed comprised of 191,116 acres.

Rationale: The THP area is located within this CAL WATER planning watershed and operations from this THP have the most potential to affect water quality within this watershed. This watershed includes a variety of topographic aspects, a variety of slope inclinations from steep to flat, a variety of soil types from very stable to highly unstable, and a variety of watercourses that range from large Class I salmonid bearing watercourses to small ephemeral Class III watercourses. It also includes a flood prone area within the Little North Fork of the Gualala River.

Note: As mapped by CalWater, approximately 3 acres of the plan area appear to be in the Robinson Creek Planning Watershed (1113.810002). The area that crosses the mapped boundary is located on the flood plain near the confluence of the Little North Fork and North Fork of the Gualala River. It is apparent that CalWater drew the boundary in this area arbitrarily as a straight line from the hillslope to the confluence of the two rivers. The RPF conducted a review of a GIS hill shade relief and inspected the area in the field. It was determined that the area in question in fact drains toward the Little North Fork and should be included in the Doty Creek Planning Watershed. For this reason, the Robinson Creek Planning Watershed is not included in this assessment.

SOIL PRODUCTIVITY ASSESSMENT AREA (SAA):

Assessment Area: The area within the THP boundary will be the assessment area.

Rationale: All effects on the soil will occur within the THP area.

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT

BIOLOGICAL RESOURCES ASSESSMENT AREA (BAA):

Assessment Area: The Biological assessment area will be the same as the watershed assessment area plus an additional 0.7 miles perimeter around the THP boundary which is the area assessed for Northern spotted owls and other mobile non-aquatic species. For aquatic species, the assessment area is the Class I and II watercourses, springs, ponds and wet areas within the planning watersheds of the WAA.

Rationale: This area encompasses a large enough area to account for wildlife movement and includes a variety of habitat types representative of the area.

RECREATION ASSESSMENT AREA (RAA):

PART OF PLAN

Assessment Area: Within 300 feet of the THP boundary will be the assessment area.

Rationale: All effects on recreation are most likely to occur within this area.

VISUAL ASSESSMENT AREA (VAA):

Assessment Area: The assessment area for impact to visual aesthetics is the area within 3 miles of the THP.

Rationale: Beyond three miles forestry activities are difficult to discern.

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT

PART OF PLAN

TRAFFIC ASSESSMENT AREA (TAA):
Assessment Area: The assessment area for traffic is the private road system south of the THP to county road 501 and from there to Old State Hwy and then to Hwy 1 or north of the THP to the Fish Rock Road and from there to the Old State Hwy and then to Hwy 1. It is also possible to use the old return road (a private road) to the upper mill and then to Old Stage Road. See appurtenant road map in section II.

Rationale: These are the first roads not part of the logging area on which logging traffic must travel.

NOISE ASSESSMENT AREA (NAA):
Assessment Area: The area south and west of the THP.

Rationale: These are the only populated areas that could conceivably be affected by the noise of the logging operations.

GLOBAL WARMING ASSESSMENT AREA (GWAA):
Assessment Area: The area within the THP boundary will be the assessment area.

Rationale: Virtually all effects relating to the sequestration of carbon will occur in the immediate vicinity of the growing trees on the THP.

WILDFIRE RISK AND HAZARD ASSESSMENT AREA (WRHA):

Assessment Area: The plan area and that area within 300 feet of the plan boundary on the north and west sides. Additionally, that area within a quarter mile on the east, south and southeast side is included.

Rationale: Modification to the vertical and horizontal distribution of forest fuels and the use of tools or vehicles that can affect wildfire risk or hazard associated with proposed timber operations is limited to the plan area. The assessment area outside the plan boundary is consistent with existing notification requirement distances. This allows for assessment of possible ignition sources and forest fuel loading not associated with the proposed project but could combine to produce a cumulative increase in wildfire risk and hazard.
Privately owned parcels occupied by year round residences to the east, south, and southeast of the THP also pose risks.

For a listing of the individuals, organizations, and records consulted please see the end of this CWE analysis.

A. Watershed Resources Assessment

PART OF PLAN

1. Beneficial Uses of Water

The watershed resources that are affected by potential adverse impacts of this project are the beneficial

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

uses of water in the Gualala River which are designated in the Water Quality Control Plan for the North Coast Region (Section 2.2) as: municipal supply and domestic supply, agricultural supply, industrial service supply, water contact recreation, non-water contact recreation, commercial and sport fishing, cold freshwater habitat, wildlife habitat, groundwater recharge, navigation, migration of aquatic organisms, spawning, reproduction and/or early development, estuarine habitat, rare, threatened, or endangered species, water quality enhancement, flood peak attenuation/flood water storage, wetland habitat, water quality enhancement and subsistence fishing. The following table indicates estimated cubic feet per second (cfs) diversions during the year from the entire Gualala River Watershed as determined by the Gualala River Watershed Technical Support Document (GRWTSD) prepared by the Water Quality Control Board (2001).

Estimated Water Uses in the Gualala River Watershed

Water Use	Estimated Maximum Withdrawal Rate (cfs)
SWRCB appropriative rights	8
Vineyards—dry and frost	27-100
Rural Residential	2.5
North Gualala Water Company	2
Sea Ranch	2.8
Potential total diversion amount	**42.3 – 115.3**

2. Watershed Description

The Gualala River Watershed produces high natural volumes of sediment due to the geology and the topography. "The combination of the underlying pervasively sheared and often folded Franciscan rocks, recent uplift, and a distinctive climate accounts for the large sediment yields." (Kelsey et al 1981) (Gualala River Watershed Technical Support Document for Sediment North Coast Regional Water Quality Control Board, pg.31). The THP area is located within the floodplain and on the adjacent slopes of the Little North Fork Gualala River. This Class I watercourse has extensive alluvial flats or floodplains which support a productive second and third growth redwood forest. These alluvial flats act as a buffer between the steeper upslope areas, from which sediment is migrating, and the major watercourse channels. During peak flows sediment that is carried from transport reaches in steep Class I, II and III watercourses at the headwaters of the watersheds drop out of suspension as they cross the lower gradient storage reaches, and deposit sediment on the alluvial flats, that occur adjacent to the river. Some smaller Class III watercourses that feed directly into the alluvial flats disappear into the sandy soil without contributing their sediment load directly to higher order watercourses. Numerous low spots within the flats along the river also act as sediment catch basins when the main tributaries of the Gualala River periodically overflow their banks during peak flow events during the winter and spring seasons. The slopes above the floodplain of the Gualala River are well vegetated with redwood, Douglas-fir, bishop pine, buckeye, tan oak, madrone, big leaf maple, California bay, and several other hardwood species in small amounts. Floodplains are dominated by coastal redwood with intermixed hardwoods of California bay and red alder, all of which can tolerate short term water inundation.

Precipitation within these watersheds is on average 70 inches per year, which comes mainly in the form of rain. Much of the year the area has coastal fog that provides moisture to the redwood forests from leaf drip

PART OF PLAN
149
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

and reduces evaporation by providing cover from solar radiation.

The lower reaches of the Gualala River system have limited ability to retain large woody debris because of the width and size of the channels. The bank vegetation, although thick, is incapable of shading the entire watercourse in many locations due to the wide channel. Sediment that is washed down, often from many miles upstream during peak flow events will drop out of suspension on the alluvial flats due to the slower low gradient flows that occur there. The development of the adjacent floodplains is based on the fact that they are sediment deposition areas. On the South Fork of the Gualala GRI has documented an increase in floodplain elevation between 1953 and 1986 of approximately 3.5 feet. Measurements on the North Fork of the Gualala indicate that at least 1 foot of sediment has been deposited in the flood prone areas within the last thirty years.

The landowner contracted O'Connor Environmental, Inc. to conduct channel migration zone evaluations and determination of flood prone areas (O'Connor's reports can be found in Section V). O'Connor performed both office analysis and modeling and in the field analysis.

Channel Migration: Analysis of aerial photographs covering the period 1953-2010 did not reveal channel migration processes in the Little North Fork Gualala. This is a significant finding in that channel migration processes, where present, are typically evident in historic aerial imagery, and because the ASP regulations apply to channel migration that occurs within the time frame required for the affected area to grow mature conifers. The absence of observable channel migration over a ~60-year period strongly suggests that channel migration processes subject to the ASP regulations do not occur in the Little North Fork Gualala. Field evidence and hydraulic simulations did reveal one instance where potential exists for a significant channel avulsion that could laterally shift the primary channel of the Little North Fork Gualala 200 to 300 feet over a distance of about 1,000 feet. As a result of the analysis this area has been removed or avoided in the THP.

Flood Prone Area: O'Connor utilized hydraulic analysis to determine the 20 year flood prone area on the Little North Fork Gualala. There are no stream gages present in the Little North Fork watershed. O'Connor applied an area-normalized discharge from flood frequency analyses performed on larger gaged watersheds within the same coastal region. The end product was detailed maps depicting the flood prone area of the watershed based on 2 different estimates of magnitude. The THP maps are based on the higher magnitude determination.

CAL FIRE's Pete Cafferata (Watershed Protection Program Manager), Drew Coe (Forest Practice Monitoring Program Coordinator) and Stacy Stanish (Forest Practice Biologist) prepared the Hydrologic and biologic Review of THP 1-18-095 MEN (See THP Section V). In this report they state, "It is our opinion that the plan proponent, Gualala Redwood Timber, Inc. has utilized the key components suggested by the Riparian Protection Committee's final report to determine the flood prone area for the Little THP. We find that the flood prone area delineations flagged on the ground and mapped as part of the Little THP follow the requirements of the California Forest Practice Rules for the following reasons:

PART OF PLAN

RECEIVED

150 MAR 16 2021

COAST AREA OFFICE
RESOURCE MANAGEMENT

(1) The Little North Fork Gualala River channel is laterally stable and generally lacking a channel migration zone, except for the 1000 foot stretch denoted as CDFW No. 4 in the O'Connor Environmental, Inc. channel migration zone report (OCE 2019a) (see Channel Migration Zone discussion above).

(2) The factors listed in the Forest Practice Rule flood prone area definition for determining the outer boundary are to be considered in totality; the BOF did not assign greater weight to any one factor over another.

(3) We observed in the field that there were:

a. No silt lines on the coast redwood trees beyond at the currently flagged edge of the Inner Zone B in the lower Little THP unit, even though Dr. O'Connor (OCE 2019b) documented that approximately a 20 year recurrence interval flood flow event occurred in February 2019 in the Little North Fork of the Gualala River watershed.

b. No fresh fine sediment or silt deposits on the floodplain beyond the designated Inner Zone B boundary in the lower unit.

c. No evidence of floatable debris (flotsam) caught in brush or trees beyond the designated Inner Zone B boundary in the lower unit.

d. No disturbance tree species in the overstory canopy (expect for the designed 1000 foot reach at CDFW Site No. 4).

e. No evidence that the elevation of the surface lies near the elevation of the highest channel features (e.g., log jams and gravel bar surfaces) (except for the designated 1000 foot reach at CDFW Site No. 4).

(4) Given that the vast majority of the Little North Fork can be considered a laterally stable watercourse lacking a Channel Migration Zone, as supported by the analysis in Section III of this report, and the outer boundary of the flood prone area cannot be clearly determined using the field indicators listed in the definition, as per the Forest Practice Rules, it is appropriate to determine the outer boundary of the flood prone area based on the area inundated by a 20-year recurrence interval flood flow event.

(5) The procedures described in the Riparian Protection Committee's final report have been followed and well documented in the three O'Connor Environmental, Inc. reports (OCE 2019a, b, c) written and submitted as part of this THP, as well as verbiage included in the plan by the RPF. The level of modeling and analysis completed is well beyond what is expected for a standard THP and meets the expectations for determining flood prone area delineation.

(6) The protection measures provided for the delineated flood prone area and larger floodplain area (with less frequent inundation recurrence intervals) were found to be appropriate and meeting the Anadromous Salmonid Protection rule requirements. In particular, these measures include (a) pre-flagging all skid trails in the units, (b) requiring ground skidding equipment to remain on designated skid trails, and

PART OF PLAN
151
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

(c) requiring all side channels to remain open and free to flow water. The plan proponent has flagged skid trails to utilize existing skid trails to the maximum extent possible. In flood prone areas, crawler tractors will be required to drive with their blade elevated except as needed to move debris, resulting in no new excavation except at watercourse crossings or to improve conditions at existing site-specific problem areas."

3. Potential Specific Watershed Impacts

Section 916.4 (a)(1) of the Forest Practice Rules states that the RPF or supervised designee shall evaluate areas near, and areas with the potential to directly impact, watercourses and lakes for sensitive conditions including, but not limited to, existing and proposed roads, skid trails and landings, unstable and erodible watercourse banks, unstable upslope areas, debris jam potential, inadequate flow capacity, changeable channels, overflow channels, flood prone areas, and riparian zones wherein the values set forth in 14 CCR §§ 916.4(b) are impaired. The RPF shall consider these conditions, and those measures needed to maintain, and restore to the extent feasible, the functions set forth in 14 CCR §§ 916.4(b), when proposing WLPZ widths and protection measures. The plan shall identify such conditions, including where they may interact with proposed timber operations, that individually or cumulatively significantly and adversely affect the beneficial uses of water, and shall describe measures to protect and restore to the extent feasible the beneficial uses of water. This field assessment was done by the RPF and the following characteristics of the plan area were determined.

1. **Existing and proposed roads, skidtrails and landings** - There are no proposed roads in this plan. In Section II a work order that contains road points has been prepared (THP page 63). These points contain beneficial soil stabilization actions for a number of locations. Probably no aspect of logging has more potential to negatively impact watercourses than the improper creation and maintenance of the road systems. Elsewhere in this analysis information has been given on the efforts being made to stormproof GRT's road system. On the road system that is specific to this plan the following points that relate to Section 916.4 (a) (1) can be made. The majority of the road system is in the WLPZ. Between the road system and the major watercourse of concern (the Little North Fork of the Gualala River) there is a flat, sometimes back tilted buffer of heavily vegetated ground except in a couple of locations which can trap sediment and prevent discharge to the stream. The use of skid trails that enter the WLPZ is proposed in those cases where the alluvial flat is wide. All skid trails have been pre-flagged to avoid sensitive riparian areas and reduce potential erosion hazard. The use of the landings that are located in the WLPZ are existing and do not requiring any new excavation. The use of these landings also reduces the amount of skidding that will be needed on the main haul road and this reduces the production of fines from disturbing the roadbed. Overall, the road system in this plan has a low probability of creating negative impacts to the watershed because of the vegetated buffer that will capture suspended sediments and the low gradient crossings which have low erosion potential. The skid trails and landings are similarly buffered from the Little North Fork Gualala and tributaries on the THP by vegetation and sediment generated from skidding is expected to be filtered or trapped before it can enter the watercourses.

2. **Unstable and erodible watercourse banks** - The banks of the Little North Fork of the Gualala River often have conifers growing down to the water's edge and in general these banks appear stable. The conifers that exist in this zone are relatively large in size and lean out over the river. These trees are the main source of future large woody debris. The first thirty feet of the alluvial flat adjacent to the wetted channel is the Core Zone and is main source of large instream woody debris.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

The roots of large redwood trees in this Core Zone stabilize the streambanks. No trees will be harvested from the Core Zone as required by the new ASP Rules.

3. **Unstable upslope areas** - The CGS map shows that the much of the upslope areas adjacent to the alluvial flats in the WAA are part of ancient landslide features. However, in the areas adjacent to the THP there are few mapped unstable areas. Since no new road construction is occurring there should be no effect on unstable slope areas.

4. **Debris jam potential** - Little North Fork of the Gualala River has a moderate potential for debris jams. The small jams that have occurred from the large woody debris placement program being conducted by the company is seen as a positive development for fish habitat. The small jams that have occurred are the result of a permitted large woody debris placement program being conducted by GRT and the Gualala River Watershed Council on the GRT property using grant funding. These small log jams are seen as positive developments for fish habitat as this large wood acts to help sort spawning gravels, increase pool depth and decrease stream temperature as well as provide cover for fish from predators.

5. **Flood prone areas and inadequate flow capacity** - During the winter, the alluvial flats in this plan periodically flood which indicates inadequate flow capacity in the active channel. Inadequate capacity is sometimes caused by increased deposition which raises the channel bottom causing the banks to flood. The portion of the Gualala River and its tributaries that are within the THP area have low gradient depositional reaches and bed load is transported from high gradient reaches and drops out of suspension in these areas of the river during peak flows when the river flows rise up out of the main channel. Permanent plots that were put into the stands adjacent to the Gualala River several decades ago show that portions of these flats have had as much as three and a half feet of sediment deposited on them in recent decades. Some of this sediment is undoubtedly also coming from upslope Class II and Class III watercourses that drain directly onto these flats and often disappear into the sandy soil without ever reaching the river. Although this process may have been accelerated in the past century due to increased upslope erosion, the process of alluvial flat flooding and aggradation has been going on for thousands of years according to the NCWAP watershed assessment report. Implementation of the THP under the ASP rule prescriptions will have no measurable adverse impact on the flood prone area or alter the flow capacity of the river.

6. **Changeable channels and overflow channels** - On the alluvial flats there is evidence that Class II and III watercourses have, in the past changed location as they cut through the deposited sediments. This is not a common occurrence on the THP area but when sediment builds up in these smaller watercourses there is the possibility of these channels moving. There are also small bays that extend into the alluvial flats from the main Class I channel. These areas may be important for small fish that seek refuge from peak flows in the main stream. It is unusual for these features to extend more than 50 feet from the wetted channel. Due to the limits on operating near the main channel and the requirement to pre-flag skid trails these areas of refugia will not be impacted. The ASP Rules require the protection of these overflow and changeable channels, and they will be avoided. The skid trails that are proposed for use are carefully selected and have been laid out to avoid or run perpendicular to these channels when possible.

7. **Riparian zones** - Portions of this plan are located in the riparian zone of the Little North Fork of the Gualala River (which is listed for sediment and temperature), and any negative effects to riparian zones must be mitigated. In the following sections temperature and sediment concerns and beneficial actions are addressed in depth which mitigate potential impacts including a more

PART OF PLAN

153

RECEIVED

MAR 16 2021

COAST AREA OFFICE
RESOURCE MANAGEMENT

conservative determination of the watercourse transition line than described in the ASP Rules, and minimized site specific use of WLPZ skid trails to avoid sensitive low lying areas, secondary channels and oxbows, and avoidance of wetland obligate plant concentrations. Additionally, the ASP Rules require no removal of Large Woody Debris (LWD) in the WLPZs and very high canopy retention standards throughout the flood prone portions of the plan.

Finding: This plan is not likely to adversely affect existing watershed conditions within the WAA due to the very light harvest, the soil erosion protection measures, the design of the log skidding landing and road system to minimize ground impacts, and the seasonal restrictions on operations to avoid soil compaction and disturbance. The operations on this THP will increase diversity in forest structural development by concentrating growth on the largest trees, which will extend a shaded canopy over the watercourse which are located in the most favorable position to contribute LWD to the watercourse channel.

4. Watershed Effects General Discussion

The Gualala River is 303d listed for sediment and temperature. The Little North Fork of the Gualala River is specifically exempted from the temperature listing.

In attempting to analyze and mitigate watershed effects, several sources of information have been reviewed and an attempt to summarize this information is made on the following pages. The most comprehensive study to date, The North Coast Watershed Assessment Program (NCWAP), has been extensively reviewed and cited as a pertinent source of watershed conditions in this harvest plan. Additional information is taken from reports written for previous harvest plans such as the report by consulting Fisheries Biologist Dennis Halligan of Natural Resources Management Corporation (Halligan 2000). Mr. Halligan's report contained valuable analysis of the available information and some of his conclusions are included on the following pages. The archives at the California Department of Fish and Wildlife have previously been examined for information regarding the Gualala River system and most of that information has also been included in the NCWAP report. Of particular value was the white paper titled Flood Prone Area Considerations in the Coast Redwood Zone dated November 2005.

The Gualala River Watershed Technical Support Document (GRWTSD) prepared by the Water Quality Control Board as supporting documentation for the TMDL analysis by the EPA was also reviewed. The primary objective of the GRWTSD for sediment is to identify and quantify sources of sediment in a way that allows a relative comparison of those sources and to provide information for non-point source assessment, project planning, and implementation.

The following important points have been taken from the executive summary of the NCWAP report:

1) Most of the Gualala River Watershed has improved in terms of sediment delivery from 1984 to 1999/2000, based on aerial photo interpretation of accumulations of sediment that were interpreted as indicative of channel disturbance. Specifically, since 1984 total erosion from upslope areas has not resulted in a net increase of sedimentation within the majority of the tributaries to a degree discernable in 1999/2000 aerial photos. (ES-11)

2) Pool habitat escape and ambush shelter/cover, and water depth are unsuitable for salmonids in some mainstem and tributary stream reaches in the Gualala River Watershed. Large woody debris function in the channel is low throughout the watershed. Increasing the instream habitat complexity is the primary

PART OF PLAN 154

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

recommendation for all of the sub-basins. (ES-12)

3) Water temperatures are suitable in the smaller tributaries for where data was collected. In contrast mainstem temperatures were in the unsuitable range in most of the sub-basins. (ES-12)

4) Gravel and substrate suitable for salmonids is limited in some streams and abundant in others. (ES-12)

5) Harvest of coastal redwood and Douglas-fir actively occurs today, but with substantially improved practices compared to historic logging practices. While some areas of the watershed experienced more improvement of habitat conditions than others during this period, an overall trend towards habitat improvement in the transport reaches was observed. (ES-14)

Also, according to NCWAP-

Based on the information available for the Gualala River Watershed, salmonid populations are currently being limited by

1- General watershed-wide lack of instream habitat complexity;
2- Instream sediment conditions in some areas;
3- High summer water temperatures in the mainstems; and
4- Reduced watershed-wide coho salmon and steelhead trout populations over those observed in the 1960s.

Habitat improvement activities that would most likely lead to more desirable conditions in a timely and cost-effective manner are the following:

A restoration plan that targets the general areas identified below. (ES-14 & 15)

1- Reduce sediment delivery and deposition.
2- Improve riparian canopy density and diversity
3- Continue road assessments, storm proofing, improvements and decommissioning.
4- Evaluate and address non-road sediment sources.
5- Add more large organic debris and shelter structures. (Pool depth and shelter consistently were limiting)
6- Protect high quality habitat from degradation.
7- Reduce livestock and feral pig entry.
8- Evaluate fish rescue activities.
9- Continue in-channel characteristics and stream flow monitoring.
10- Expand aerial photo interpretation of channel characteristics.
11- Expand temperature monitoring into eastern portions of watershed.

PART OF PLAN

Findings: After having studied the information that is available a conclusion can be made that the 303d listing for sediment for the Gualala River was not based on scientific evidence that the river was in fact impaired. The 303d listing was based on limited anecdotal evidence. In contrast to past information, the NCWAP report is a significant amount of new data collected and analyzed by qualified licensed

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

professionals.

The following quotation taken from NCWAP (Gualala Land Use, pg.25) applies to the whole Gualala watershed, **emphasis added**:
"The consequence of active timber harvesting conducted in the watershed since 1990 indicates that contemporary timber operations did not preclude recovery in both fluvial geomorphic stream channel characteristics and riparian canopy cover. Between 1991 to 2001, 45,070 acres or 24% of the watershed has been subject to Timber Harvest Plans. Timber harvest operations include road building, use, and maintenance associated with the active Timber Harvest Plans. **These operations have taken place during the period where CGS NCWAP mapping documents a 30-40 percent improvement in detrimental sediment storage or source attributes between 1984 and 1999/2000. Similarly, riparian canopy cover continued to improve from the midcentury bank to bank clearance operations. By the end of the tractor era in 1968, a range of 40 to 70 percent bank exposure gradually improved to approximately 25% by 1999/2000".**

"The study documented long term trends in overall watershed conditions. None of the improving trendlines have been reversed by any concentration of Timber Harvest Plan activities between 1991 and 2001. This contradicts certain projections of recent land use for cumulative effects by which a high density of Timber Harvest Plans may trigger adverse cumulative impacts in excess of the individual potential contributions from each project alone. No such cumulative processes from any collection of Timber Harvest Plans were realized in the Gualala watershed".

Another conclusion that can be drawn with some degree of certainty is that salmon are not as common today as they have been in the past. This conclusion is derived from reports in NCWAP, GRWTSD and Gualala River Watershed Literature Search assimilated by Patrick Higgins. Studies made in the 1960s noted the presence of coho salmon throughout the watersheds that were studied, but this was during an active fish stocking program that eased in 1999. Fish surveys conducted in the 2006 indicate that coho salmon had fallen to dangerously low levels or were absent entirely from many streams. Similar conclusions cannot be drawn from the data for steelhead even though such a conclusion is tentatively made in the GRWTSD. NCWAP (Appendix 5, pg. 14) reports that steelhead distribution does not appear to have changed over the past 37 years. Natural radical fluctuations in salmon populations have been noted as early as the turn of the century, however, it is a conservative approach to assume that the present declines are man caused and not due to other factors such as climate change. Corrective measures are being taken by the landowner to reduce potential man caused impacts while still maintaining the land for timber production.

As a proactive measure to improve fish habitat, the landowner is investing money in beneficial actions to reduce sediment impacts through extensive road upgrading and storm-proofing. Under miscellaneous addendums in Section V there is a listing of the numerous road upgrades that have occurred within the WAA watersheds involved (THP page 242).

PART OF PLAN

Water Temperature Effects:
The Little North Fork of the Gualala is one of the streams in the larger Gualala River watershed system

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

not listed for temperature.

MWATs taken between 1994 and 2018 show that temperature has ranged in the 14.5C to 16.2C range which is some of the best in the Gualala watershed. The upper end of fully suitable for Coho is considered to be 15.6C.

The NCWAP report states the following about water temperatures, "Overall watershed-wide riparian shade canopy has improved since the 1960s, but still falls short of the 1942 levels of canopy density and coverage." The 1942 levels showed 95% canopy coverage. It is also noted that overstory canopy cover in the lower reaches of the watershed are the highest level (this is the area of GRT ownership). , GRT owns all of the Pepperwood Creek and Groshong tributaries and these tributaries show significantly lower temperatures than the mainstem South Fork Gualala River. Most of the creeks that originate off property have higher temperatures where they enter GRT's land than they do when they reach the main stems. Halligan states in his analysis the following: "Increasing water temperatures in a downstream direction has been identified in streams and rivers throughout the world except where the watercourses become influenced by coastal weather conditions that can result in a cooling pattern. The general tendency for incremental increases in temperature has been attributed to increasing channel width reducing the effectiveness of shading from riparian vegetation, increasing air temperature, increasing stream depth and decreasing proportion of cooling groundwater inflow."

The fact that stream temperatures moderate as they pass through GRT lands may not have as much to do with management and as it has to do with the zone of coastal influence (fog belt). Besides the zone of coastal influence, the Forest Science Project affiliated with Humboldt State University found in their study titled "Regional Assessment of Stream Temperatures Across Northern California and their Relationship to Various Landscape-Level and Site Specific Attributes" (Lewis et.al 2000) that decreasing water temperature has a positive correlation between watershed size, distance from watershed divide, bank full width and canopy cover. Watershed size and distance from watershed divide are often related as are bank full width and canopy cover. In the case of the GRTs location it is the furthest point from the watershed divide and with a very wide bank full width. Therefore, you would expect higher temperatures. This is not the case as temperature decreases towards the coast as water temperatures are influence by cooler coastal air temperatures and onshore winds.

The most comprehensive study regarding shade canopy and its relationship to water temperature changes was done by Dr. Cajun James in 2003 and the following quotation is taken from the abstract of that study.

"Data collected before and after timber harvest operations in years 2000, 2001, and 2002 was analyzed to determine changes in response variables to wider (175 ft.) or narrower (100 ft.) riparian buffers. Angular canopy cover was measured to be 85% at mid-stream and no less than 80% within the riparian buffer regardless of buffer width. Vertical canopy cover was measured to be 50% within the riparian buffer for each harvest unit following the first phase of timber operations. Microclimate results show that edge effects from the adjacent upslope clearcut harvest units had no discernible impact within 40 ft. of the stream bank. In this experiment, no practical difference in the canopy cover, near-stream microclimate, or water temperature patterns were found between the wider 175-ft. and the narrower 100-ft. buffers. Results from

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

this study show that 100-ft. vegetative buffers that maintain at least 50% vertical or 80% angular canopy cover minimize potential negative impacts to the temperature of stream water and the near-stream microclimate from adjacent upslope clearcut harvest operations." (Southern Exposure Research Project: A Study Evaluating the Effectiveness of Riparian Buffers in Minimizing Impacts of Clearcut Timber Harvest Operations on Shade Producing Canopy Cover, Microclimate, and Water Temperature along a Headwater Stream in Northern California, James 2003, pg. 1)

Findings: Canopy and temperature on Class I watercourses will not be significantly changed for the following reasons: no harvesting will take place within 30 feet of the watercourse transition line of the Class I watercourse as part of this plan, the thirteen largest trees per acre are to be left so the maximum canopy height will not change significantly post-harvest, a minimum of 80% canopy will be maintained within Inner Zone A (which is variable in width but is the area between 100 and 150 feet of the transition line) and 50% canopy will be maintained throughout the rest of the flood prone area (Inner Zone B), the majority of the dominant trees will be left within Inner Zone A, and thinning/selection from below is required in both Inner Zone A and B, which leaves the larger trees in these stands which mitigates temperature fluctuations on the flood prone area. All of the Class II watercourses within this plan will maintain at least 50% canopy cover, however, since the Class II watercourses flow primarily within the Class I watercourse WLPZ the higher Class I watercourse canopy retentions standards shall apply. The slight canopy reduction from selection harvest in WLPZs of the Class II watercourses is not expected to have a significant effect on stream water temperatures on the THP or downstream waters as shade levels will remain high.

Organic Debris Effects:
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 increase in acidity or reduction in dissolved oxygen from the proposed project. Acidity and dissolved oxygen levels of water generated from the project watershed will not interact with current or reasonably foreseeable acidity or dissolved oxygen levels in watercourses within the WAA to create or add to a significant adverse cumulative effect to water quality. Nutrients derived from decaying organic debris, especially leaves and small twigs, is an important source of food for small aquatic insects, which form a substantial portion of food for fish populations, and no significant change in leaf litter entering the watercourses is anticipated due to canopy retention standards.

One hundred year old redwoods are established on the edge of the wetted channel along the North Fork of the Gualala. No harvesting will be taking place within the Core Zone, which is the first thirty feet adjacent to the transition line. Also, since there is a flood prone area the 13 trees per acre are retained in inner zone A and inner zone B. As a result, the largest trees in this plan area are being left to provide shade canopy and will provide for future recruitment trees for large woody debris (LWD), which is beneficial to salmonid habitat.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Working with the grants obtained by the Gualala River Watershed Council (GRWC), the owners of the property have placed a large number of logs in Class I watercourses; approximately 538,000 board feet of logs have been placed strategically in watercourses on the property to date and are still functioning within the creeks. GRT intends to continue this program. The placement of these logs has been cataloged with each log photographed, mapped and numbered. This allows the GRWC to record the downstream movement of these pieces (and learn how to place them more effectively) and to record the creation of pools. These logs have also been placed so that, besides creating pools, they provide shade, armor unstable banks, and redirect water flow away from potential sediment sources while creating refugia for both large and small fish. Preliminary measurements indicate that there is substantial pool creation even after the first year of placement and it is expected that these pools will continue to deepen over time. The LWD also helps to sort gravels and improves spawning habitat where the salmonids lay eggs. Through this process it is possible to speed up the recovery of the fish habitat would otherwise take decades due to the need to wait for natural windthrow of the large streamside residual trees. Refer to the Large Wood Retention data in Section V, pages 294-296 for Robinson Creek Watershed. This data shows the large number of logs placed into the Robinson Creek Watershed (29 log truck loads which is 146,105 board feet of logs). The data shows that water depth in pools under logs placed increased during the period 2004 to 2012, indicating the value of LWD in creating deeper pools. Refer to the Large Wood Retention data in Section V, pages 310-311 for Doty Creek Watershed. 54 truckloads of logs were placed in the stream and 271,376 board feet in the main fish bearing sections of streams within Doty Creek watershed including the Little North Fork of the Gualala. Water depth in pools under logs placed increased over the period 2002 to 2012 showing the value of this LWD in creating deeper pools and better fish habitat. These covered pools are shaded by the LWD and temperatures are lower in these micro-sites which are also refugia for salmonids.

Findings: This THP includes buffers and tree retention that will retain high levels of potential organic debris recruitment to watercourses, as well as provisions to remove accidental deposition of limbs and potentially harmful organic debris. A 30-foot no-cut tree retention corridor adjacent to the Class I watercourse shall provide for future large tree (LWD) recruitment. GRT's active LWD recruitment placement program under the auspices of CDFW grants will continue to provide future enhancements to instream fish habitat on the property moving forward, and accelerates the improvement of fisheries habitat with anticipated increases in numbers of fish in the North Fork and upstream tributaries/.LWD is a limiting factor in these watersheds and the GRWC efforts to increase LWD in the watershed will create excellent habitat for salmonids including the coho salmon restocking program planned by NOAA Fisheries for the Little North Fork of the Gualala. GRT has indicated its willingness to allow this restocking on their property to NOAA and CDFW biologists who visited the Little North Fork with the GRT land managers in January of 2020.

PART OF PLAN

Chemical Contamination Effects:

Chemical contamination of watercourses can occur with the introduction of chemicals or petroleum products. Chemical contamination is not known to be a significant impact to watercourses within the WAA. Potential chemical pollution sources associated with this THP are accidental spills or releases of fuels or oils from equipment or vehicles. The LTO shall adhere to 14 CCR 936.3, which states that "...the timber operator shall not place, discharge of or deposit in such a manner as to permit to pass into the water of this state, any substances or materials, including, but not limited to, soil, silt, bark, slash, sawdust, or petroleum, in quantities deleterious to fish, wildlife, or the quality and beneficial uses of water." GRT does not propose

RECEIVED
MAR 16 2021
COAST AREA OFFICE

to use any oil or chemical dust retarding materials on truck roads. Watercourse buffers limit equipment use adjacent to watercourses. Helicopter yarding (a potential source of chemical contamination due to on-site fuel storage) is not proposed for this THP. Herbicides may be used for site preparation in order to achieve stocking in this THP. If herbicides are applied they will be used to favor survival and growth of forest seedlings by reducing hardwood and brush competition for growing space and soil water, and will only be prescribed in the one upslope that is not near the Class I or Class II watercourses.

Although the plan submitter may utilize herbicides on their land following timber harvest as part of their vegetative management strategy, such use is conducted over a very small proportion of any given watershed in any one year. Herbicides are not applied near the active watercourses due to label restrictions on their application and, to an even greater extent, because little or no harvest has taken place in these near stream areas and vegetation management is unnecessary. Best Management Practices and County Agriculture Department requirements to follow label restrictions ensure protection of water quality. Waters passing down and through the project area are not expected to interact with any current or reasonably foreseeable chemical use issues in the WAA or contribute to a significant adverse cumulative effect of such use. No slash pile or broadcast burning, which is a potential source of nutrients being released into watercourses during runoff events, is proposed. Another source of chemical contamination is trespassers on the Gualala River gravel bars with all-terrain vehicles. These vehicles could conceivably puncture an oil pan or gas tank on a rock and pollute the river. They also contribute small amounts of oil every time they drive through the water. GRT personnel will notify their security contractors and the County Sheriff's department when this type of activity is observed to attempt to control this illegal activity

Findings: There are currently no known chemical contamination problems within the assessment area and provisions are taken during harvesting to avoid chemical spills any future proposed chemical use will be regulated to prevent chemical contamination, no significant adverse cumulative watershed effects caused by chemical contamination are expected from operations on this THP.

PART OF PLAN

Peak Flow Effects:

When soils become saturated and excess water is present on sloped ground run-off results. Every watercourse has a maximum limit to which it can handle run-off flows before the peak flow results and flooding occurs. The factors that determine flooding are the timing, intensity, and duration of the rainfall or water source, soil properties and topographic controls that affect the volume and timing of available runoff, and the depth or carrying capacity of the channel. Timing refers to the intervals between storms. Intensity is a measure of the rate of rainfall (i.e. inches per hour). Duration is a measure of how long the rain continues to fall. Depth is the total amount of rain that fell (in inches). It is recognized that there is no reasonable control over the timing, intensity, depth, or duration of rainfall. Simply put, if it rains hard enough and long enough, flooding will result when flow exceeds the confines of the channel.

Heavily harvested watersheds generally have higher peak flows than uncut watersheds from storms occurring early in the season. This is a result of less interception and evapotranspiration by tree canopies. Research in a local coastal watershed shows that early season storm events result in higher peak flows following disturbance from timber harvesting as canopy levels are reduced. The proximity of the THP to the mouth of the Gualala means that any increases in peak flow generated from the THP area would have

RECEIVED
MAR 16 2021
COAST AREA OFFICE

a minor effect on the overall flow during a flood event. The very low level of disturbance from the proposed harvest will not significantly add to past operations within the watersheds, such that no impacts from increased peak flow events such as increased erosion of channel banks downstream is expected to occur from operations on this THP.

Findings: The watercourses in the plan area have been walked, ocular evaluations have been weighed, and peak flows on this property have been considered. Since 85% of the THP is harvested using the selection method or is no-cut, ground and vegetation disturbance shall be minimized and impacts from peak flows are not likely to increase due to the harvest of the THP. Peak flows from water generated from the project area will not interact with current or reasonably foreseeable timing or intensity of peak flows in the WAA from other known operations to create or add to a significant adverse cumulative effects from such peak flow events.

PART OF PLAN

Fog Drip:

Timber stands close to the coast receive significant amounts of moisture from fog drip. Dawson (1996) determined that 8-34% of water used by coastal redwood trees and 6-100% of water used by under-story vegetation originated as fog drip. The closer to the coast the more pronounced the effect since more days have significant fog. The removal of canopy by harvesting would necessarily reduce the amount of fog interception and therefore could reduce fog drip (at least temporally until the canopy closes).

The effect on ground water and stream flow is less clear since although fog drip is reduced by removal of canopy through logging, evapotranspiration is also reduced by the removal of the tree. Loss of evapotranspiration from forest harvest may be a more significant variable to changes in watershed hydrology than fog drip (Keppeler 1998).

Findings: Since this THP is close to the coast vegetation receives a significant amount of moisture from fog drip although this use is balanced by the fact that much of the plan is on the flood prone area of the Gualala River and the water table is significantly higher with soil water more available to the standing timber than in upslope areas. In addition, the high canopy retention standards in the FPA result in a short-term effect on the amount of fog drip water available from selective harvest as the canopy grows back rapidly. Any reduction in timber growth from less fog drip will probably be more than made up for by the increase in sunlight available to the residual stand. No significant effects on stream flow either positive or negative would be expected from this light harvest where only approximately 15-20%of the current basal area of conifers is removed through harvest in the FPA. Impacts on water captured by fog drip will not be significant in the FPA due to the light selection harvest and in upslope areas water loss to fog drip will be offset by reduction in evapotranspiration.

5. Watercourse Conditions Assessment (Stream Morphology):

The major watercourses in this watershed are the Little North Fork of the Gualala River, Doty Creek and Log Cabin Creek. Two monitoring reaches have been established in this watershed. Site 203 on the Little North Fork is a monitoring reach and is measured every year.

Following are the conclusions of NCWAP with modifying notes of more recent stream measurements when

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

available from the Gualala Watershed Council and GRT stream reports.

PART OF PLAN

Embeddedness - NCWAP reports that embeddedness was moderately suitable on the Little North Fork and somewhat suitable on Log Cabin Creek. Note-(Target values are that greater than 50% of the stream length is less than 50% embedded).

Stream Aggradation – NCWAP report indicates that aggradation is not occurring in the Gualala River watershed. The conclusion of the NCWAP (Executive summary ES-18) report is that "Instream sediment depositions indicative of disturbance occur along 33 of 140 miles of blue line streams, representing a 42 percent reduction from 1984 observations." Reductions in streambed aggradation were determined by comparing aerial photos from 1942 to1999/2000. Several years of Thalweg profiles surveyed in GRWC monitoring reaches supports a conclusion that stream aggradation is not now occurring in the WAA. Evidence suggests thalwegs are slightly increasing in average depth on the monitoring reaches in the WAA or degrading as sediments from old logging practices before the 1973 Forest Practices Act continue to wash downstream. Variation Index (VI) measures the complexity of the channel bed; reduction of complexity occurs with excessive sediment introduction; increased complexity indicates a recovery from such a condition. A variation index above 20 is a good indication of recovery. The variation index in the Doty Creek watershed is between 20 and 57 with an average of 32.

Stream Channel Characteristics - Pool depth and frequency have been reported in NCWAP as lacking in almost all of the sub basins including the ones listed above. Placement of large woody debris by GRWC in the WAA watercourses for several years has been monitored and there is a resulting increase in pool depth and frequency. See Thalweg reports in Section V (THP page 254). For the Little North Fork pool depth, although increasing significantly is still lacking in deeper pools (3 feet plus). The landowner has agreed conceptually with the NMFS to improve upstream back flooding in the Little North Fork. This would involve installing instream structures at a naturally formed choke point formed by the valley walls. The landowner has agreed to work with NMFS on this project but both parties have decided the project would be better served being implemented outside of the THP process (See NMFS letter THP Section V).

Temperature and Canopy Cover - The average stream temperature measurements (MWAT) is fully suitable as discussed above. On the study reaches the average canopy density in the WLPZ is between 76 and 97, bank full canopy density is between 90 and 97 and channel center density is between 89 and 96. See 'Stream Monitoring Reports' in Section V.

Pool Filling - Pool filling is not an issue according to measurements. In lower Doty Creek Variation Index longitudinal cross sectional area of pools >1 foot deep, and percent of pools >3 feet deep increased from 1998 until 2014, but trended down in 2015-2016, which may have been a result of the drought of 2012-2015 as there were few peak flows to wash sediment out of this lower gradient reach (Station 211) .

Bank Cutting and Bank Mass Wasting - Bank cutting and bank mass wasting, appears to be happening along the banks of the Little North Fork more dramatically than in the main stem North Fork where the elevation change between the flats and the creek are not as dramatic. This may be partially a result of the

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT

Thalweg drop mentioned above as sediment flushes of the system thereby increasing the steepness of the banks. These are not study reach measurements but the RPF's observations during plan layout.

Scouring and Downcutting - No areas of scouring have been noted. Channel avulsion has occurred in the past along the Little North Fork as evidenced by abandoned channels. These side channels appear to have been stable for the last twenty years based on observations by the RPF but indicate past disturbance.

Woody Debris – Class I watercourses have been discussed earlier but have very high amounts of LWD as part of the restoration efforts. Class II watercourses in this THP have average, or moderate, amounts of large woody debris and this level is expected to increase as stands age within the associated WLPZs. Bank full LWD measurements can be found in the stream report in section V.

Bank Vegetation (includes understory and low-lying vegetation) – Unvegetated areas adjacent to the main watercourses are very rare. WLPZ protections require mulching and seeding any bare areas created by timber operations greater than 100 square feet at close of operations. Canopy retention standards and no-cut zones in some locations maintain a large tree canopy adjacent to Class I and II watercourses. An analysis of aerial photos by NCWAP notes that there has generally been a significant increase in stream side canopy in the last thirty years in the Gualala River Watershed in general. NCWAP (Executive Summary ES-13) notes that "overall, watershed-wide riparian shade canopy has improved since the 1960's but still falls short of the 1942 levels... however riparian zones in the western portion have largely recovered from the first round of logging". Class II watercourses in this THP generally have dense bank vegetation cover.

Recent Floods – Flooding in this small watershed only seems to be occurring in the extreme southern portion of it before reaching the north fork. From there, until reaching the ocean, the Gualala regularly floods its banks.

Restorable Class II Watercourses – There are no restorable Class II watercourses in or near the THP area.

Beneficial Efforts to Mitigate Impacts and Improve Watershed Conditions Specific to the THP –

Beneficial Efforts for Sediment Reduction:

1) The GRWC in partnership with Sotoyome Resource Conservation District, the California Department of Fish and Game and the landowner has completed the restoration of all the high and medium priority timber and ranch roads within the Doty Creek Watershed.
2) The previous owners GRI have stabilized thousands of yards of sediment sources in the last two decades within this and adjacent watersheds.
3) No additional LWD placement is proposed as part of this harvest since it is felt that enough LWD has been placed in the Little North Fork of the Gualala and it is best to wait and evaluate the effects before progressing. The landowner continues to place LWD in other major watercourses.
4) Longlining of trees from the main haul road will occur when possible. WLPZ skid trails have all been flagged and LTO will be limited to using these. This will require extra effort and expense on the part of the landowner and LTO. Many skid trails have been preflagged throughout the plan even when outside of the WLPZ in order to limit the disturbance of soil and vegetation.
5) No log hauling shall occur when turbid water is running in the inside ditch or when water is

PART OF PLAN

running across the road that has direct access to a watercourse. Seasonal roads and landings shall be used only during dry rainless periods when they are generally firm and easily passable.

6) No winter operations are proposed for the period between Nov 15th and April 1st.
7) The L.T.O. shall install waterbars on skidtrails and unrocked landings prior to the next working day, extended periods of shutdown, or weekends whenever the national Weather Service forecasts a 30% or greater chance of rain within any 24 hour period. LTO shall be responsible for monitoring the weather forecasts.

Beneficial Efforts for Temperature Effects -

In order to not impact stream temperatures negatively the following standard FPR beneficial actions are included.

1) Conservative interpretation of the Rules regarding transition line location has resulted in an expanded Class I watercourse WLPZ. Also, the entire floodplain is now a riparian protected zone.
2) A no-cut zone for the first 30 feet past this transition line will result in an approximately seventy-foot-wide heavily forested zone adjacent to the river channel consisting of the largest trees next to the river all being left. This zone along with the thirteen largest trees per acre and a minimum of 80% canopy left in the Inner Zone A and a minimum of 50% canopy left in inner zone B means that there will be no significant impact on the shade canopy of the river.
3) Stream canopy retention standards on all Class II watercourses (see item 26 above) and the leaving of all hardwoods within the WLPZ should maintain good canopy cover on class II watercourses.

Beneficial Efforts for Organic Debris Recruitment -

1) No removal of Large Woody Debris (LWD) from WLPZs will be allowed in this plan.
2) The landowner has proactively introduced LWD into the watercourses in this watershed. GRT plans to continue this practice under the auspices of CDFW and NOAA Fisheries grants.
3) Thirteen largest trees per acre are being left along with most trees that are leaning toward the watercourse.

Beneficial Efforts to Prevent Chemical Contamination -

1) All state and federal regulations pertaining to the handling and storage of fuel must be adhered to during logging operations.
2) All state and federal regulations pertaining to herbicide use must be adhered to.

PART OF PLAN

Findings: Summary of Watershed Analysis Specific to this THP

This THP includes a number of site-specific protection and mitigation measures designed to protect watershed resources. These measures include buffer zones and site-specific design of the log skidding system to reduce potential soil disturbance near watercourses and within the flood plains, seasonal restrictions to limit wet weather operations, and specific actions to stabilize roads surfaces and watercourse crossings. Although timber operations have occurred and are planned to occur elsewhere within the WAA, those operations have been and are expected to be identified by the RPF preparing the plan and by the responsible agencies reviewing the plan and mitigated to prevent significant adverse impacts. In terms of

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

cumulative impacts, the very limited potential of sediment discharge from operations on this THP and other recent THPs in the WAA are not expected to combine to create cumulative adverse effects on beneficial uses of water resources. Additionally, the road stabilization and watercourse restoration efforts that have been performed within the WAA during the past fifteen years under the auspices of stream and habitat improvement grants awarded to the GRWC and completed on the GRT lands within the WAA have had a significant positive impact in reducing significant amounts of sediment that would have entered the watersheds in the WAA. More than 295,000 cubic yards of sediment discharge have been avoided on the property as a whole since these restoration efforts were initiated from road stabilization work and hydrological disconnection of those roads from the watercourses. Trends in the watersheds within the WAA are showing improvements based on monitoring studies conducted by the GRWC including deepening of pools, lowering of water temperatures, increases in variability index in streams, increase of LWD for cover, pool formation and gravel sorting all of which benefit listed salmonids. In summary the operations on this THP, and on recent and future planned THPs within the WAA indicate that no cumulative watershed impacts will occur with the implementation of this plan.

B. SOIL PRODUCTIVITY ASSESSMENT

Past Projects- The following Table shows past THPs that have been conducted within the same footprint of the proposed plan going back to 1975 following the passage of the Z'Berg-Nejedly Forest Practice Act of 1973.

THP number	Unit from this plan that overlaps old THP number
1-92-015men	1
1-92-039men	1
1-91-482men	2, 3
1-87-140men	3
1-77-209men	1

PART OF PLAN

Site factors to be addressed for cumulative soil productivity impacts include:

1. **Organic matter loss**
2. **Surface soil loss**

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

3. **Soil compaction**
4. **Growing space loss**

PART OF PLAN

Organic Matter Loss: Loss or displacement of organic matter is primarily caused by use of heavy equipment for skidding and site preparation, surface erosion, and high intensity fires. Organic matter loss can cause loss of nutrients contained in the topsoil and biomass associated with the harvest area. Most of the biomass nutrients are contained in the topsoil and foliage of the existing vegetation. Use of a limited number of existing skid trails per plan mitigations will help to limit the amount of organic matter disturbance on the plan. Pre-flagged skid trails within the flood prone area (FPA) have been located to access timber efficiently, with a minimum of ground disturbance.

Specific Mitigation: In order to ensure minimal ground disturbance from ground based yarding, tractors may not drive with their blade lowered within the FPA, except as needed to move debris. No excavation shall occur on FPA except at watercourse crossings described in Section II of the plan or as needed to improve drainage or resolve access problems resulting from previous logging operations. This mitigation shall reduce the potential for significant impacts in combination with past, present, and reasonably foreseeable probable future projects identified above, from having a reasonable potential to cause or add to significant cumulative impacts to organic matter loss.
The use of selection and thinning from below silviculture prescriptions for the majority of the plan will retain a canopy cover that will continue to contribute organic matter to the heavy duff layer within the FPA.

Surface Soil Loss: Loss of topsoil can significantly reduce soil productivity as the highest nutrient content is contained in the top layer of the soil. Surface soils can be lost due to erosion and displacement by heavy equipment. While displacement of some topsoil and organic matter is unavoidable on haul roads and skid trails, the loss will be minimized by proper installation and maintenance of erosion control structures, and straw mulching and grass seeding where needed as specified in Section II, Item #18, of the THP. With skidding equipment 1) limited to primarily rolling over existing understory vegetation and the heavy duff layer without any blade use in the FPA, 2) skid access confined to limited existing pre-flagged skid trails used by past harvest entries, and 3) with the objective to minimize skid trail use to access marked timber by end-lining where feasible, disturbance to soil within the flood prone area shall be minimal. Observations from the impact of past harvest entries on these areas or similar areas on the property have shown that no measured soil exposure occurs when harvest operations are conducted under the similar mitigated conditions.

Soil Compaction: Within the plan area soil compaction is associated with the use of heavy equipment, especially during saturated conditions. Soil compaction can affect site productivity through the loss of the ability to transmit air and water and by restricting root penetration. The restrictions of the operations during the winter period as specified in Section II, Item #18 and Item #23 will prohibit tractor operations during periods when soil moisture is high, and compaction is most likely to occur. Also, outside of the winter period, the plan has wet weather restrictions for heavy equipment use well. Skidding will occur on pre-flagged skid trails some of which were compacted in the past prior to the inception of the 1973 Forest Practice Act, but this operation is not anticipated to compact those trails further. This operation will not result in or create a significant level of soil compaction.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Growing Space Loss: Loss of growing space to road, landing and permanent skid trail construction is an unavoidable factor in most harvest systems. It will not be necessary to build any new roads for this THP and existing skid trails will be sufficient to access the plan areas. Many old skid trails will not be used and all necessary skid access within the WLPZ has been flagged. No foreseeable net loss of growing space will occur.

Findings: The soil productivity assessment area includes the area within the THP boundary where potential adverse impacts are most direct and is exclusive of the appurtenant road system accessing the plan. As indicated in the soil impacts analysis above, any impacts to the soil resources are expected to be very limited with no discernable adverse impacts with the mitigation measures incorporated regarding skidding of logs. An Erosion Control Plan (ECP) is imbedded as an active operation feature of the THP as well to facilitate enrollment with the State Regional Water Quality Control Board's General Waste Discharge Requirements (GWDRs) program. This ECP reiterates the measures to be taken to control and monitor sediment discharge off the project area. Along with the THP the ECP addresses any necessary mitigations for the protection of the soil resource, the drainage off truck roads, and the installation and monitoring of sediment control structures. Little to no change in soil productivity is expected to occur as the result of this harvest operation.

This project combined with past and expected future projects will not result in significant adverse cumulative impacts to the soils within the assessment area due to requirements and mitigations included in the THP to protect soil resources.

C. BIOLOGICAL RESOURCES ASSESSMENT:

Biological Resources:

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Animals (non-aquatic): The scoping process involved doing a query of the Natural Diversity Database on June 2018 for the Gualala 7.5 min map and the quads surrounding them. Although the biological assessment area is the Doty Creek watershed (except for spotted owls) this NDDB search gives a wider geographic assessment of possible occurrences in the general vicinity of the THP. The NDDB printout can be found in section V (miscellaneous addendums). The following animal species (grasshopper sparrow, point arena mountain beaver, Sonoma tree vole, pacific tailed frog, obscure bumble bee, western bumble bee, rhinoceros auklet, Townsend's big eared bat, monarch butterfly, California giant salamander, western pond turtle, North American porcupine, tufted puffin, Bald Eagle, foothill yellow legged frog, California red-legged frog, tidewater goby, pink salmon, coho salmon, steelhead, and Gualala Roach, Behrens silver spot butterfly, red bellied newt, American Badger) occurred on the Natural Diversity Database nine quad search . The scoping process also involved reading adjacent THPs, reading the Gualala River Watershed Assessment Report, reading Lawrence Kobernus' report titled "Wildlife Species with Special Status that may be present On Gualala Redwoods or other HJW managed properties" (updated May 1999). The stream reports referenced in the sources list commissioned by GRT were also studied.

GRT's GIS database, which is updated continually with new findings, was also consulted for known listed wildlife in the scoping area. Spotted owls are reported within 0.7 miles in a CNDDB query. Coho salmon have been known to occur when there was an active fish planting program, and steelhead trout occur naturally within watercourses in the scoping area of the Gualala River Watershed.

Plants: Near the end of this section is the rare plant scoping summary and the plant survey.

The following reference sources were used to determine the range and habitat requirements of listed species and to aid in field identification.

California Native Plant Society website

PART OF PLAN

California Natural Diversity Data Base, June 2018

Raptors of California, Hans and Pam Peeters, 2005 University of California Press

The Audubon Society Field Guide to North American Bird, John Whitaker, Alfred Knopf Inc 1992

The Audubon Society Field Guide to North American Bird, Bebler and King, Alfred Knopf Inc 1992

California Mammals, E.W. Jameson and Hans Peeters, University of California Press, Berkeley, 1988.

California's Wildlife, Vol. I - Amphibians and Reptiles, California Statewide Wildlife Habitat Relationships System, May 2, 1988.

California's Wildlife, Vol. II - Birds, California Statewide Wildlife Habitat Relationships System, November, 1990.

California's Wildlife, Vol. III - Mammals, California Statewide Wildlife Habitat Relationships System, April, 1990.

Field Guide to the Birds of North America, National Geographic Society, 1987.

Scats and Tracks of the Pacific Coast, James Halfpenny, 1999 Falcon Publishing

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

SENSITIVE AQUATIC SPECIES

Sensitive Fish species

Fisheries Habitat

The following are the Class I watercourses within the Biological assessment area for aquatic life. The major watercourses in the Doty Creek watershed are the Little North Fork of the Gualala River, Doty Creek, Log Cabin Creek and several unnamed watercourses. Additional information may be included below for upstream and downstream areas even though they are outside the assessment area.

Current Fish Species in the Gualala River Watershed, California

Common Name, Scientific Name

Anadromous

Coho salmon, *Oncorhynchus kisutch*
Steelhead trout, *Oncorhynchus mykiss*
Pacific lamprey, *Lampetra tridentata*

Freshwater

Gualala Roach, *Lavinia symmetricus parvipinnis*
Coast range, sculpin *Cottus aleuticus*
Prickly sculpin, *Cottus asper*
Riffle sculpin, *Cottus gulosus*
Threespine stickleback, *Gasterosteus aculeatus*

Marine or Estuarine

Surf smelt, *Hypomesus pretiosus*
Pacific herring, *Clupea pallasii*
Staghorn sculpin, *Leptocottus armatus*
Starry flounder, *Platicthys stellatus*

PART OF PLAN

Many of the issues that affect fish survival such as large woody debris, sedimentation and temperature are addressed above in the watershed assessment.

The following aquatic species, Southern Torrent Salamander, California Red-legged Frog, Tailed Frog, Foothill Yellow Legged Frog, and the Western Pond Turtle have potential habitat in the watercourses and will be protected by WLPZ protections and other FPA rules as listed elsewhere in the THP.

Coho Salmon (Oncorhynchus kisutch), Steelhead (Oncorhynchus mykiss), and Chinook Salmon (Oncorhynchus tshawytscha)

The life cycles of anadromous fish involve habitation of both inland freshwater streams and the ocean. Adult fish migrate into inland fresh water from the ocean and spawn. The offspring hatch and live a portion of their lives in freshwater and then migrate into the ocean. In the ocean the fish continue to grow and mature. After several years the fish return to the streams (usually of their birth) and spawn.

The decline of anadromous fish populations in the Gualala River and on the north coast of California has been attributed to many factors. Quantitative assessment of what the decline is caused by is somewhat lacking. Possible factors affecting the anadromous fish include stream habitat conditions, water diversion, ocean conditions, global and regional climate changes, introduction of hatchery bred fish, introduction of exotic species, spread of disease by hatchery stock, predation by birds and mammals, commercial, sport and subsistence fishing, and poaching. Most likely, declines in coho and steelhead populations are caused by a combination of factors with higher temperatures, shallower pools, and limited ocean access to the river (because the mouth is often closed by the gravel bar) being primary causes for declines in populations.

Chinook Salmon (Oncorynchus tshawytscha) Status: Federal- Threatened- Past surveys do not show this

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

species to be present. Anecdotal evidence may indicate that the species was in the Gualala watershed in the past. Small runs of Chinook reportedly were observed in the 1990's (CFL 1997).

Silver Salmon / Coho (Oncorynchus kisutch). Status: Federal – Threatened, California – Endangered. See below for summary for what is known about this species.

Steelhead (Oncorynchus mykiss) Status: Federal-Threatened. See below for summary for what is known about this species.

Summary of Historic (1964-1981) Stream Surveys Conducted in the Gualala Mainstem/South Fork Sub-basin (from NCWAP, Appendix 5, pg. 8-11)

Mainstem South Fork Subbasin	Date Surveyed	Habitat Comments	Barrier Comments	Recommendations Management
South Fork	9/23 and 9/24 1964 5/17 and 18/1977	Plentiful spawning areas throughout the stream. Pool: Riffle 95:5. Generally poor shelter consisting of overhanging banks, boulders, logs, aquatic plants and overhanging aquatic plants. Summer flows are limited. Pool: Riffle ratio 7:3. The majority of pools had little to no shelter. Shelter consisted of boulders, aquatic plants, logs, undercut banks, and overhead canopy	Old Log Jams. None Complete. No barriers observed. Each summer a dam is constructed approximately ½ mile below the Wheatfield Fork.	Continue to manage for production of juvenile steelhead trout and coho salmon.
Marshall Creek Marshall Creek Tributary #3 Marshall Creek Tributary #5	9/28/1964	Deposits of good spawning gravel exist throughout the stream from the mouth to the upper fisheries value. Pool: Riffle ratio 50:50. Good shelter provided by logs, boulders, undercut banks, roots, and trees.	No complete barriers.	Should be managed as a steelhead trout and coho salmon spawning and nursery stream.
	9/28/1964	Very limited fisheries value. Watershed severely burned 10 years ago. Lower half mile has spawning gravel available, but summer flow is very low.	Total barrier to fish a half mile above the mouth.	None
	9/29/1964	Summer flows are limited. Some suitable spawning gravel directly above large log jams.	Over 40 log jams in a 1 mile stretch of stream. A number form complete fish passage barriers.	Remove log jams.
McKenzie Creek	9/23 and 24/1964	Spawning areas fair to good in the lower 1/3 of stream, excellent in the middle section of stream, and fair in the upper 1/3 of stream; Pool: Riffle ratio 60:40; Good shelter provided by rocks and undercut banks.	7 partial barriers; Large 7 feet high 40 feet dam present 1/6 mile upstream from mouth; Large bedrock falls 1-1/4 miles upstream	Continue to manage as a coho salmon, steelhead trout spawning and nursery area. After removal of falls, possible planting of coho salmon to re-establish a self-sustaining population.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Coho Salmon and Steelhead Trout Data Summary by Decade, Gualala River Watershed, California

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Decade	Coho Salmon	Steelhead Trout
1940s	A.C. Taft, chief of the Bureau of Fish Conservation, noted that the fishing pressure on the Gualala River increased 200-300% immediately after World War II ended in 1945	A.C. Taft, chief of the Bureau of Fish Conservation, requested that the entire Gualala River and its tributaries be closed to fishing for small and immature steelhead trout and salmon. Upon his recommendation, the summer closure began in 1945 and remained until 1982.
1950s	In 1952, electrofishing below the confluence of the North Fork revealed that the length frequencies of the fish removed showed a healthy condition (Kimsey 1952). Bruer (1953) wrote that there are millions of young steelhead trout and coho salmon in the Gualala watershed. In 1957, Fisher, cited that the adverse logging conditions and past improper practices had done considerable damage to the headwaters. This was primarily in the form of old logjams, debris and siltation. By 1959, the summer opening was not worth while for a person who must travel any distance (Kastner 1959).	During December 1954 through February of 1955, creel surveys were conducted to determine the quality of the steelhead trout fishery on the Gualala River. Five hundred and seven fish were checked. A total catch estimate of 1,352 fish for the season was extrapolated with data from a use count. In 1956, Fisher, concluded that the Gualala remained one of the better Region III steelhead trout streams. It appeared to sustain a good steelhead trout population despite the poor environmental conditions over a considerable portion of its headwaters. He speculated that unaffected tributary streams must have provided good spawning conditions.
1960s	Stream surveys were conducted in 1964. The species presence and relative abundance of salmonids were estimated from observations recorded while walking upstream along the banks. These surveys had no quantitative basis from which to estimate populations. Where coho salmon were observed during these stream surveys the management recommendations included "possible planting to re-establish a self supporting run" (Table 3-5). Based on CDFG's management prescriptions of the time, this recommendation likely indicated that the native coho salmon populations were not self-sustaining prior to 1964. CDFG reported population estimates of 4000 coho salmon in 1965. This population estimate was made without any supporting data thus is not reliable. The estimate was ranked "C without data" the lowest quality rating designated by the California Fish and Wildlife Plan, Volume III. In 1969, 90,000 coho salmon were planted.	Steelhead trout were present during stream surveys in 1964. Only one creel census survey was conducted on January 24, 1962. The result of the survey showed 11 steelhead trout caught by 18 anglers. Total angler hours were 56.5 resulting in a catch-per-unit-effort of 0.20 fish/hour. CDFG reported steelhead trout population estimates of 16,000 in 1965. This population estimate was made without any supporting data, thus is not reliable. The estimate was ranked "C without data", the lowest quality rating designated by the California Fish and Wildlife Plan, Volume III.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1970s	Hatchery plants of coho salmon; 1970, *30,000*; 1971, *30,000*; 1972, *15,000*; 1973, *20,000*; 1975, *10,000*. Total number of coho salmon planted in the 70s, *105,000*. Some streams were surveyed in 1970 with methods similar to those conducted in 1964 (Table 3-5). It is not known how many of the coho salmon observed during these stream surveys were from the 120,000 planted in 1969-1970. No mention of marked or unmarked hatchery coho salmon were found in the planting records or stream reports In the mid-1970s, the CDFG's Coastal Steelhead Project was conducted, in part, on the Gualala River, California. In 1972-73, the creel censuses began in November and resulted in high counts of coho salmon catches with 831 total coho salmon counted. All other years, the creel censuses began in December after the peak of the coho salmon run had passed. In the 1973-74 survey fifty-two coho salmon were counted, in the 1974-75 survey ten coho salmon were counted, in the 1975-76 survey ten coho salmon were counted and in the 1976-77 survey no coho salmon were counted. California Drought PART OF PLAN	Some streams were surveyed in 1970 with methods similar to those conducted in 1964 (Table 3-5). The steelhead trout observed during these stream surveys were assumed native as planting did not occur until 1972. The steelhead trout planted during the 1970s were 12,750 in 1972; 20,300 in 1973; 15,600 in 1974; 24,600 in 1975; and 10,070 in 1976, a total of 83,320. The Mad River Hatchery yearling steelhead trout were marked by a fin-clip. CDFG reports cite origins of brood stocks as Mad River Hatchery, South Fork Eel River and San Lorenzo River. In 1972-73, L.B. Boydstun, CDFG fish biologist, estimated that the fishing effort on the Gualala River had probably increased over 60% since the early 1950s, when the only other creel censuses were conducted. In spite of the increased pressure during the 1972-73 season, the steelhead trout catch was around 25% of what it was during the 1953-54 and 1954-55 seasons. He attributed the poor catch to smaller populations. During the 1972-73 creel census, 288 steelhead trout were caught. No recognizable hatchery fish from the spring planting in 1972 were observed. During 1975-76 and 1976-77, steelhead trout population estimates were made as part of a five-year study. This study utilized creel census, use counts, adult tagging, and downstream migrant trapping in conjunction with the planting of steelhead trout. The goal of the project was to estimate winter adult steelhead trout populations, estimate angler harvest rates and evaluate the contribution of hatchery steelhead trout to the fishery. This program focused on enhancing the Gualala River as a sport-fishing stream. The steelhead trout population estimate was 7,608 in 1975-76 and 4,324 in 1976-77, 95% confidence intervals. Two years of data is not sufficient to establish a population trend. Adult steelhead trout population data does not exist after 1977. Harvest estimates were made at the end of the fishing seasons for each of the five years studied. In the 1972-73 season, 288 fish were surveyed. In 1973-74, 1682 steelhead trout were marked for possible recapture. In 1974-75, there were 793 fish counted and in 1975-76, there were 1418 fish counted. Eleven percent of the fish surveyed in 1975-76 were hatchery fish, and a 20.3 % harvest rate was calculated. In the 1976-77 season, there was a 19.8% harvest rate with no hatchery fish recorded. No creel census results were documented from the 76-77 season. The surveys typically began in December. The 1972-73 survey began in November.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1980s	From 1985-1989, 102,000 coho salmon were planted.	From 1983-89, 301,770 steelhead trout were planted in the Gualala River. The year totals of steelhead trout planted were; 12,500 in 1983; 13,400 in 1984; 9,700 in 1985; 57,450 in 1986; 26,250 in 1987; 108,750 in 1988 and; 73,700 in 1989. Bag seines were employed five times during the years of 1984-1986, to sample the game and non game fishes of the Gualala River estuary. The purpose of this survey was to assess the impact of proposed water diversions on aquatic species, in general, and juvenile salmonids, in particular. On Robinson Creek, one station was three-pass electro fished and showed a steelhead trout density of 0.85 per meter. Since electrofishing data were collected only in 1983 on Robinson Creek, insufficient data exists in which to make comparisons. Three pass electrofishing data were collected on a lower and upper site in the Little North Fork in 1988 and 1989. The surveys resulted in an average steelhead trout density of 0.45 per meter on the Little North Fork. In 1989, juvenile steelhead trout population on Fuller Creek (approx. 6 mile long, 3 rd order stream) was estimated at 62 with a standard error of 8.599. Four stations were fished with a two or three pass depletion electro-fish method. These stations were located on South Fork and Mainstem of Fuller Creek. The intent of this survey was to assess the impacts from the upstream logging. Station 4 was upstream of the falls on the South Fork, where resident rainbow trout were observed. Young-of-the-year and one year and older steelhead trout, western roach, and three-spined stickleback were found during these surveys.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1990s	Over three years, 45,000 juvenile coho salmon from the 1995-1998 brood years were planted in the Little North Fork. The juveniles were from the Noyo River Egg Collecting Station run by CDFG in Fort Bragg, CA. During snorkel surveys, Gualala Redwoods, Inc. observed coho salmon young-of-the-year on the Little North Fork, Robinson and Dry Creek in 1998 Between July 1, 1999 and June 30, 2000, spawner and electrofishing surveys were conducted on the Little North Fork Gualala River. These surveys were conducted to determine whether the planting of coho salmon during the 1996-98 periods was effective. No coho salmon were found.	In 1990, a total of 41,300 steelhead trout were planted in the Gualala River. Since1993, the Gualala River Steelhead Project rescued steelhead trout juveniles from streams in danger of drying up during the summer months. Rescued fish were kept in two Doughboy pools at the hatchery on Doty Creek, a tributary to the Little North Fork of the Gualala River. The fish are released in the North Fork Subbasin and main stem Gualala River after the first substantial winter rains increase stream flows. From 1993-1997 and 1999-2000, 37,030 steelhead trout have been rescued and 20,328 have been released. During 1990-93, 95, 98, 99 and 2000 three-pass electrofishing data were collected on a lower and upper site in the Little North Fork. No effort was recorded in 1990-1992. Both sites showed small fluctuations in young-of–the year populations. Both sites showed a slight increase in one year old fish from 1995-2000. Two year and older steelhead trout numbers were identical at the lower site and slightly increased at the upper site from 1998-2000. In 1995, one-pass electrofishing surveys were conducted on Fuller Creek and South Fork Fuller Creek. Young of the year, year plus and two year plus steelhead trout were observed. The results were not comparable to the 1989 survey, due to differences in sampling techniques. Gualala Redwoods, Inc. conducted snorkel surveys in 1997, 1998 and 1999. In 1997-98, one year and older steelhead trout were observed in Buckeye Creek and South Fork. In 1998, one year and older steelhead trout were observed in the Wheatfield Fork. In 1999, one year and older steelhead trout were observed in Little North Fork, Robinson Creek, North Fork and Doty Creek.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

2000-2002	Between July 1, 1999 and June 30, 2000, spawner and electrofishing surveys were conducted on the Little North Fork, a tributary to the North Fork by CDFG. These surveys were conducted to determine whether the planting of coho salmon during the three-year period of 1995/96-1997/98 were effective. Robinson Creek and Dry Creek were surveyed in 1999, 2000, and 2001, no coho salmon were found (CDFG unpubl. data) Historical coho salmon streams listed by Brown and Moyle (1991) were electro-fished in September, 2001. The method used was the modified ten-pool protocol (Attachment D). The streams electro-fished were North Fork, Doty Creek, South Fork, Franchini Creek, Wheatfield Fork, Haupt Creek, Tombs Creek, House Creek, Pepperwood Creek and Marshall Creek. This survey was specifically aimed at establishing coho salmon presence in the streams sampled. Coho salmon were not found in any of the streams surveyed. Coho Salmon Status Review (2001) stated no known remaining viable coho salmon populations in the Gualala River system. In September 2002, coho salmon young-of-the year were present on Dry Creek, a tributary of the North Fork during a snorkel survey and two sites on the Little North Fork and Doty Creek during electrofishing. Coho young-of-the-year were present on McGann Creek, rescued and released (R. Dingman, pers. comm.)	In 2000-2001, 7,600 and 5,450 steelhead trout were planted on the North Fork between Elk Prairie and Dry Creek. During snorkel surveys, Gualala Redwoods, Inc. observed one year and older steelhead trout on: Little North Fork, Robinson, North Fork, and Dry Creek in 2000 and 2001; on the mainstem of Buckeye Creek in 2000 and 2001; and on the South Fork in 2000 and 2001. February-April 2001, a volunteer effort steelhead trout spawning surveys observed redds on Wheatfield Fork, Tombs Creek, Britain Creek, House Creek, and South Fork. Redds were observed on Rockpile Creek in 2001 (K. Morgan, pers. comm).

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

2003 to 2019	The last observed coho were in Dry Creek in 2004.	The survey in 2008 shows steelhead in every creek surveyed which included Dry, Robinson, Big and Little Pepperwood, Buckeye the Little North Fork , the North Fork, the South Fork and Wheatfield forks of the Gualala. Since then surveys have been conducted in 2009 and 2011to 2018 in most of the watercourses listed above with steelhead present in all surveys although numbers have been depressed since 2016 probably as a result of the drought. For additional population data on Steelhead see Stream Monitoring Reports for Robinson Creek and Doty Creek Planning Watersheds in Section V.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Gualala Roach (Lavinia symmetricus parvipinnis) Status California-Special Concern- Eleven specimens of Gualala Roach were collected by Wendy Jones in 1999 on the South Fork of the Gualala River near the Annapolis road at Valley crossing and the confluence of the Wheatfield fork Gualala River. Numerous other records of this fish in the past are noted in the Gualala River Watershed Technical Support Document (GRWTSD).

Although no population estimates have been conducted, the bulk of stream surveys show that roach have increased in abundance while coho have disappeared and steelhead have decreased in most tributaries of the Gualala.

Snorkel surveys conducted in 2018 – Snorkel surveys which covered the North Fork and Little North Fork did not find coho salmon in 2018. Steelhead were found in every creek surveyed. Additionally, Gualala Roach have been observed during surveys as well as Sculpin, three spine stickleback and lamprey eels. Refer to GRWC Biological Report in Section V, for data summarized from snorkel surveys for salmonids from 1998-2018 in the Robinson Creek Planning Watershed, pages 290-292, and Doty Creek Planning Watershed, pages 308-309.

PART OF PLAN

Beneficial actions for Fish Populations-

Almost all of the beneficial actions that are stated above in the watershed section of this report are intended for the benefit of the salmonid populations in the Class I watercourses in the BAA and WAA. Sediment production and stream temperature effects will be minimized by application of the Forest Practice Rules in addition to the raised standards applicable to this plan. Road storm-proofing has already occurred on much of the BAA and WAA which is significantly reducing sediment delivery to the Class I watercourses.

Many of the factors that affect anadromous fish populations are beyond the control of GRT. Factors that GRT could potentially influence have been addressed by protection measures included in the Forest Practice Rules and site specific mitigations in the Erosion Control Plan for the THP.

The following measures have been incorporated into this THP to provide for the protection of anadromous fish habitat resources:

- Section II under Item 18, Soil Protection and 26, Watercourse Protection. The watercourse buffer zones, canopy requirements, and other watercourse protection requirements are designed for the protection of anadromous fish habitat and for the other listed and unlisted aquatic species.

- Tree marking within the WLPZs within the THP shall be completed before the preharvest inspection to ensure an adequate opportunity for evaluation by the reviewing agencies.

- No winter period operations are proposed to reduce potential impacts on soils and potential for sediment being transported during peak flows during the wet weather season.

- Forty-six of the 251 acres of this plan are no-cut zones because of the ASP WLPZ protection rules.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

- At least 80% overstory canopy shall be retained for water temperature regulation within the Inner Zone A WLPZs of the Class I watercourse. At least 50% overstory canopy shall be retained for water temperature regulation within the Inner zone B WLPZs of the Class I watercourse.
- All hardwoods will be left uncut within the WLPZs except where they are a safety hazard.
- All Class I and Class II watercourse core zones and channel zones are no-cut zones.
- Recruitment of large woody debris for instream habitat and shade canopy will be provided by retaining the 13 largest trees per acre in the class I inner zones and large Class II watercourse WLPZ.
- All road work order points as described in the road work database in Section II have been included in order to minimize sediment production from the existing road system.
- An Erosion Control Plan is included in this THP.

The application of the Forest Practice Rules and specific beneficial actions for soil stabilization, winter operations, and watercourse protection, as described in this timber harvest plan will prevent significant impact to coho salmon and steelhead.

PART OF PLAN

Reptiles

Northwestern Pond Turtle (Clemmys marmorata marmorata). Status: California - Species of special Concern: In California, this species ranges from the Oregon border south to Kern County (Bury 1962). The specific habitat of this species includes areas of permanent water such as ponds, lakes, rivers, marshes, sloughs, and drainage ditches. This species can range up to four hundred meters from their water habitat. It is known that western pond turtles exist and breed within the assessment area. They may be found within the Gualala River and probably in most if not all of its tributaries. There are wet areas that remain wet well into the year during a normal year. There are Class I watercourses that could support pond turtles either within or near the THP area. No turtles have been observed within the THP area, and the Core Zone protection measures will protect this species, which typically resides on the banks of streams and rivers.

Amphibians

Southern Torrent Salamander (Rhyacotriton variagatus) Status: California – Species of Special Concern- The range of this species in California coincides with the extent of humid coastal forests in the northwestern part of the state, up to approximately 3,900' above sea level, south to Mendocino County (Anderson 1968). The specific habitat of southern torrent salamanders includes cold mountain streams, springs, seeps, waterfalls, and moss-covered rock rubble with flowing water in humid coastal coniferous forests (Anderson 1968, CWHR 1979, Bury and Corn 1988, Welsh 1990). These salamanders seem to inhabit the splash zone and are rarely found more than one meter from water (Anderson 1968, and Nussbaum and Tait 1977). Southern torrent salamanders' range includes Del Norte, Humboldt, western Siskiyou, Trinity and Mendocino Counties. Marginal suitable habitat does exist within the watershed and but not within the THP. The THP is south of the recognized range. The RPF has had the training to recognize southern torrent

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

salamander habitat. None of these salamanders have been discovered on GRT property.

Tailed Frog (Ascaphus truei). Status: California - Special of Special Concern. Tailed frogs range from southern Mendocino County north through the coastal ranges into Oregon and Washington. THP area falls south of traditional range. Suitable fast rushing creeks do exist within parts of the watershed but not within the THP boundaries. Limitations on equipment operations and canopy retention standards within the WLPZs will reduce potential impacts on this species if they are present.

California Red-Legged Frog (Rana aurora draytonii). Status: Federal- endangered California - Species of Special Concern. Some of the following habitat description is excerpted from: U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California Red-legged Frog (Rana aurora draytonii). U.S. Fish and Wildlife Service, Portland, Oregon. viii + 173 pp.

General Habitat. The frog uses a variety of areas, including various aquatic, riparian, and upland habitats usually below 3,500 feet in elevation.

Breeding Habitat. Breeding sites of the California red-legged frog are in a variety of aquatic habitats; larvae, tadpoles, and metamorphs have been collected from streams, deep pools, backwaters within streams and creeks, ponds, marshes, sag ponds, dune ponds, springs and lagoons. Breeding adults are often associated with deep (greater than 0.7 meter [2 feet]) still or slow moving water and dense, shrubby riparian or emergent vegetation (Hayes and Jennings 1988), Reis (1999) found the greatest number of tadpoles occurring in study plots with water depths of 0.26 to 0.5 meters (10 to 20 inches). California red-legged frogs also frequently breed in artificial impoundments such as stock ponds.

Dispersal and Use of Uplands and Riparian Areas. During periods of wet weather, starting with the first rains of fall, some individuals may make overland excursions through upland habitats. Most of these overland movements occur at night. Frogs have been observed to make long-distance movements that are straight-line, point to point migrations rather than using corridors for moving in between habitats. During dry periods, the California red-legged frog is rarely encountered far from water. California red-legged frogs have been known to travel up to 1.4 km straight line from the breeding site however the majority of frogs never travel further than 30 meters from the breeding site.

Summer Habitat. California red-legged frogs often disperse from their breeding habitat to forage and seek summer habitat if water is not available. This summer habitat could include spaces under boulders or rocks and organic debris, such as downed trees or logs, or in mammal burrows and moist leaf litter; industrial debris; and agricultural features, such as drains, watering troughs, abandoned sheds, or hay-ricks. California red-legged frogs use large cracks in the bottom of dried ponds as refugia.

Water Quality: California red-legged frogs are sensitive to high salinity, which often occurs in coastal lagoon habitats. Observations indicate that California red-legged frogs were absent when temperatures exceed 22 degrees Celsius (70 degrees Fahrenheit), particularly when the temperature throughout a pool was this high and there are no cool, deep portions.

Wet Season defined: Wet Season starts with the first frontal rain system depositing a minimum of 0.25 inches of rain after October 15 and ends on April 15.

Dry Season defined: Dry Season starts April 16 and ends with the first frontal rain system depositing a minimum of 0.25 inches of rain after October 15.

Predators and Disturbance:

Raptors, bobcats, racoons, foxes, rough-skinned newts, otters, herons (both great blue and green) and

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

other predators are known to be in or around the project area. The wider assessment area includes developed areas of The Sea Ranch and associated paved roads. Dogs, domestic cats, vehicles, lawn mowers, pesticides and livestock associated with developed areas are a threat to frogs. Residential lighting may affect frogs during migration. Bullfrogs (a predator of red-legged frogs have been heard and seen in ponds in the assessment area. Falling, skidding, log hauling and other vehicle traffic associated with logging could disturb or kill individuals.

Nearest recorded sighting:

Although positive identification has not been made because of restrictions on handling it is believed that red legged frogs exist adjacent to the plan boundaries along the main haul road in a wet inside ditch. They are also thought to exist in the drafting holes dug in the gravel bar along the south fork of the Gualala River.

Timber Harvest Plan Habitat: The THP area contains Class I, Class II and Class III watercourses and some ephemeral wet areas. Two areas in Unit #1 have been designated as potential red legged frog habitat and will receive additional protections and one inside ditch is believed to contain red-legged frogs and protection measures will be developed in consultation with CDFW. The Class III watercourses flow only in response to rain and do not offer potential habitat. Class II watercourses in the plan area may exhibit shallow pools but when flowing the current may be too fast to offer breeding habitat. Class II watercourses may have water present into spring and summer. The flood prone area of the THP may provide habitat in the form of shallow standing water but the canopy is quite dense and the flooded areas dry out early in the year so the habitat does not appear to be optimal. The class I and II watercourses have no-cut zones adjacent to them and then have limited selection harvesting outside of that zone. See item 26 for specifics on watercourse protection measures.

Assessment Area Habitat:

Within the assessment area there are known ponds that include; sag ponds, several unclassified ponds and numerous seasonal wet areas (low spots that collect water). The sag ponds are generally shallow (less than 2 feet) and dry partially or completely during the spring and summer. Some ponds do have emergent vegetation in the form of pond lilies or cattails. The seasonal wet areas may hold water after rainfall. These areas may be up to several feet deep during the winter but tend to be dry during the summer.

The major watercourses in this watershed are the Little North Fork of the Gualala River, Doty Creek, Log Cabin Creek and several unnamed watercourses. Class II watercourses in the assessment area may exhibit shallow pools but when flowing the current would be too fast to offer breeding habitat. Class II watercourses may have water present into spring and summer and can act as a corridor for migration however telemetry studies indicate that the frogs that do migrate usually just go in a straight line to their destination.

The Class III watercourses flow only in response to rain and do not offer potential habitat.

Foothill Yellow-Legged Frog (Rana boylii). North Coast population are abundant in the Gualala River and other stream systems and are not listed. Adult foothill yellow-legged frogs are moderately sized (between 1.5 and 3 inches long) with yellow color under their legs. They inhabit partially shaded, rocky perennial streams and their life cycle is synchronized with the seasonal timing of streamflow conditions.

COAST AREA OFFICE
RESOURCE MANAGEMENT

Adult frogs move throughout stream networks from winter refugia to mating habitat where eggs are laid in spring and tadpoles rear in summer. These frogs need perennial water where they can forage through the summer and fall months and the primary cause for mortality in eggs is desiccation. This makes drafting from shallow watercourses where the water level is lowered a concern for this species. Eggs and tadpoles prefer stream temperatures higher than those required for salmonids, with tadpoles selecting temperatures between 16.5C and 22.2C. The installation of crossings on watercourses is another area where this frog or its egg masses can be impacted.

This species is also occasionally found in other riparian habitats including moderately vegetated backwaters, isolated pools, and slow moving rivers with mud substrates. (Don T. Ashton, Amy J. Lind, and Kary E. Schlick; 1997) Threats include predators such as garter snakes, bullfrogs, herons and raccoons. Other threats include droughts, floods and human disturbance. Populations of R. boylii have declined in southern and central California south of the Salinas River, Monterey County, and also in the west slope drainages of the Sierra Nevada and southern Cascade Mountains east of the Sacramento and San Joaquin Rivers. In the Coast Ranges north of the Salinas River R. boylii stills occurs in significant numbers in some coastal drainages. (Jennings and Hayes 1994).

These frogs do occur in suitable habitat in the assessment area. Any adult frogs that may exist near the THP will be protected by WLPZ requirements. This frog's egg masses will also be protected by the limitations that are part of the 1600 agreement which severely limit the reduction of water levels that are allowed during water drafting. Class I crossings are cleared of fish during installation and frogs will be cleared from the immediate area at the same time. The mitigations contained in the plan for protection of the red-legged frog, as well as fish, will also protect the foothill yellow-legged frog and its habitat. Operations of this THP under stated plan restrictions and mitigations will not likely result in a take, nor have any adverse impact on the species.

Sensitive Bird Species

During layout of this plan the THP area was traversed numerous times. Recordings of sharp-shinned hawks, Coopers hawks and Goshawks (both adult and juvenile) were played repeatedly at numerous locations throughout the THP in May and June 2018 without eliciting a response. Signs of possible raptor predation have been seen on the appurtenant road system but no raptor nests, plucking posts or concentration of mutes were discovered.

PART OF PLAN

Species that are of special concern-

Bald Eagle (Haliaetus leucocephalus). Status: California - Endangered (1971), Federal - Delisted 2007. In California, bald eagles breed in the northern quarter of the state. The species winters throughout most of their breeding range, with half of the state's population wintering in the Klamath Basin (Zeiner et al. 1990b). Specific winter habitat of this species is generally large trees with open crowns near large creeks,

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

rivers, or lakes that have a fish supply.
In Mendocino and Sonoma County bald eagles are a rare winter migrant; only a few individuals are observed annually. These wintering eagles are opportunistic hunters and scavengers, normally passing through the area during their winter migration. The Gualala River drainage provides foraging habitat. Bald eagles prefer large trees to hunt from. The proposed project will have no effect on bald eagles foraging opportunities.
There are no known nests of bald eagles in the assessment area. Bald eagles are a premier species and are quite visible. If nesting was occurring in the area it is doubtful that it would be missed by local residents or by foresters or biologists working for the company. A mature bald eagle was seen wintering on the estuary of the Gualala River in December 2007 and again in the winter of 2013, and a pair have been seen in the vicinity of the lower estuary of the Gualala on a number of occasions in 2017 and 2018.

Golden Eagle (Aquila chrysaetos). Status: California - Special Concern.

PART OF PLAN

The range of golden eagles in California is throughout the state, scarce in the southeastern desert region, and they are found in rolling country with lightly wooded areas, savannas, grasslands, desert edges, farms, or ranches. The species is a rare to uncommon resident and breeder (Harris 1991). The overall breeding densities of this species are relatively low, due to territorial spacing of nesting and foraging habitats. Overall population densities of this species currently appear stable, but excessive disturbance at nest sites can cause nest failure.

In Mendocino County and Sonoma County the golden eagle is an uncommon permanent resident and local breeder. Locally, golden eagles use a variety of habitats, including conifer and hardwood forests, mixed conifer-hardwood woodlands, coastal oak woodlands, and grasslands. Golden eagle forage and roosting habitat with some nesting habitat can be found in the assessment area and golden eagles have been infrequently observed soaring over landowner's property. Usually golden eagles prefer cliff ledges or large wolfy trees in more upslope and remote areas. Adjacent clearcuts provide foraging habitat. No large nest structures were observed and no golden eagle nests are known to exist in the assessment area.

Northern Goshawk (Accipiter gentilis). Status: California - Species of Special Concern.
In California the northern goshawk is an uncommon resident. Goshawks typically breed on north slopes, near water in the densest parts of mature conifer forests but close to openings. The nest is usually located in fork of large horizontal limbs in large live trees at the bottom of the live canopy. In the north coast redwood belt goshawks are extremely rare nesters and irregular transients. They are not known to breed this far south in the coast range. It is unlikely but possible that goshawks will use the type of second growth redwood forest present on this THP however the RPF has searched for visible evidence of goshawks, such as adults or juveniles, plucking posts, or nest structures and played recordings of goshawks repeatedly. It is unlikely that goshawks are present within the THP area or the assessment area.

Cooper's Hawk, (Accipiter cooperi)-Status: California species of special concern.
In California, this species ranges throughout the state, but is not common in the northwest and southeast. In the north coast region, they are an uncommon resident, more regularly seen in winter, and breed sparingly throughout (Harris 1991). Incidental sightings on this ownership corroborate this assessment. Nesting habitat of this species in California is most frequently in dense stands of live oak, deciduous riparian

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

stands, and other forested habitats near water.
The potential nesting habitat for this species within the THP is possibly in the hardwoods or small conifers that exist adjacent to the watercourses. Since all harvest trees within the WLPZs will be premarked destruction of any possible nests will be less likely. Coopers hawks have been observed on the east side of the Gualala River downstream of the THP area.

PART OF PLAN

Sharp-Shinned Hawk (Accipiter striatus)- Status: California species of special concern.
Both the breeding and wintering habitats of this species have been characterized as woodlands of young or open forests with a variety of plant life forms (Johnsgard 1990). Remsen (1978) suggested that timber harvest may be a threat to nesting habitat of this species, but the work of other authors indicates that forest harvest resulting in younger stands benefits the species (Postovit and Postovit 1987, Reynolds et al. 1982). Sharp-shinned hawks prefer to breed in young stands of conifer and tanoak. Habitat does exist within the THP for this hawk. Sharp-shinned hawks are regularly observed hunting on landowner's property. No sharp-shinned hawks or nests were observed during plan layout. Prey remains of small birds are commonly found on the landowner's property and these are most likely from Sharp shinned hawks.

American Peregrine Falcon (Falco peregrinus anatum). Status: California - Endangered (1971), Federal – Delisted
In California, the species breeds and winters throughout the state, with the exception of desert areas (CDF&G 1990). In the north coast region, they are an uncommon migrant and winter visitor; a rare, local breeder, and summer resident (Harris 1991). The specific habitat of this species is tall cliffs for nest and perch sites with protection from mammalian predators and the weather, most often close to water and adequate prey populations. Peregrines are not known to be present in the vicinity of the project and there are no large vertical cliffs within the biological assessment area. It is known that peregrines forage up and down the coast, up some of the major river valleys and over the clearcut blocks, which fall within the biological assessment area. This foraging area will not be affected by operations. Logging activities should not negatively impact the birds' ability to capture prey. The proposed project will have no effect on Peregrine Falcons.

Northern Spotted Owl (Strix occidentalis). Status: Federal - Threatened (1990), State Threatened (2019). An uncommon, permanent resident in suitable habitat. The Northern Spotted Owl primarily inhabits old growth forests in the northern part of its range (Canada to southern Oregon) and landscapes with a mix of old and younger forest types in the southern part of its range (Klamath region and California) . The species' range is the Pacific coast from extreme southern British Columbia to Marin County in northern California. It nests in cavities or on platforms in large trees and will use abandoned nests of other species. The Northern Spotted Owl is primarily nocturnal. Its diet consists mainly of wood rats (Neotoma sp.) and flying squirrels, although it will also eat other small mammals, reptiles, birds and insects.

One threat to spotted owl populations, at least in the northern part of its range, has been the loss of old-growth and mature late-seral forest, which contains large dead trees for nesting and prey habitat, as well as cool, dark roosts under the dense overstory canopy. Fragmentation of remaining habitat results from logging and roads and may have increased predation by Great Horned Owls and other species. More recently (since 1960s), a related eastern species, the Barred Owl (Strix varia), has invaded the Pacific

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Northwest. Barred owls are larger, more aggressive, and compete for both nest-sites and food. It is believed that Barred Owls occasionally attack spotted owls but the evidence for this is sparse. More likely the slightly larger barred owl displaces Spotted Owls from their territory. Barred Owls will also mate and hybridize with spotted owls. Barred Owls in the west occur in both young and old forest and are thought to displace spotted owls from their territories in old growth and mature forests. Additional threats to Spotted Owls include loss of habitat to wildfire and forest diseases, and also the West Nile Virus.

The habitat typing used in this assessment is consistent with the USF&WS Coastal Northern Spotted Owl Habitat Description.

Nesting-roosting habitat includes: 60% (or greater) canopy cover of trees 11 inches (or larger) diameter at breast height.

Foraging habitat includes: 40% (or greater) canopy cover of trees 11 inches (or larger) diameter at breast height. Basal area of 75 (or greater) sq. ft. of trees 11 inches (or larger) diameter at breast height.

The timberland owner is working with Forest Ecosystem Management (FEM) to develop and refine the Northern Spotted Owl habitat classification in GIS, which will allow for more accurate habitat mapping and analysis. FEM biologists ground truth habitat typing during NSO surveys and Activity Center walk-in visits. FEM's preliminary overview finds that company has correctly mapped the NSO habitat, and in some cases is more conservative than the FEM surveyor's typing.

Priority Ranking of Habitat Retention Areas.

Tree Species Composition.

Mixed conifer stands should be selected over pine-dominated stands.

PART OF PLAN

A. Abiotic Considerations include the following:

i. Distance to Nest.

I. Nesting-roosting and foraging habitat should be located closest to identified nest tree(s), or closest to roosting tree(s), if no nesting trees are identified.

ii. Contiguity.

I. Nesting-roosting habitat within the 0.5-radius circle around an activity center must be as contiguous as possible.

II. Fragmentation of foraging habitat must be minimized as much as possible.

iii. Slope Position.

I. Habitats located on the lower one-third of slopes provide optimal microclimatological conditions and an increased potential for the presence of intermittent or year-round water resources.

iv. Aspect.

I. Habitats located on northern aspects provide optimal vegetation composition and cooler site conditions.

v. Elevation.

I. Habitat should be located at elevations of less than 6000 feet, although the elevation of some activity centers (primarily east of Interstate 5) may necessitate inclusion of habitat at elevations greater than 6000 feet.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Size and Shape of Habitat Patch

a. Narrow strips of habitat (WLPZs, retention areas between clearcuts, etc.) may contain the characteristics of nesting-roosting habitat. However, when these narrow strips of habitat are surrounded by unsuitable or low quality habitats, they function as foraging habitat at best.

b. Narrow strips of habitat (100 meters or less) provide for a lot of edge habitat and little or no interior habitat. Franklin et al (2000) describe interior habitats as the amount of spotted owl habitat ≥100 meters from an edge. They describe edge habitat as edge between spotted owl habitat and all other vegetation types.

c. Because WLPZs, for example, are 100 meters or less in total width, they are considered edge habitats surrounded by unsuitable habitat. Edge habitats do not provide for protection from predators nor do they provide the microclimates of interior habitats.

PART OF PLAN

No take discussion-

The THP as proposed will not 'take' NSOs nor will NSO habitat within the assessment area be reduced below threshold levels established by the Forest Practice Rules or guidelines recommended by USFWS. Approval of this THP will require the Director to determine there will not be a take of Northern Spotted Owl (NSO) as a result of timber operations. This determination will be based on the fact that the plan is in conformance with 14CCR 919.9 (e) and current guidelines developed by USF&WS specifically to avoid take of NSO. The USF&WS guidelines are intentionally ultraconservative to ensure that, if followed, the Director can confidently determine no take will occur. THP Section II, Item 32 contains operational actions to avoid take of NSO. THP Section V contains non-operational information such as CNDDB reports, activity center walk-in survey results, evening survey results, pre and post-harvest habitat maps, a map of survey routes and tables of activity center habitat acreage summaries. This non-operational information provides the Director supporting evidence that the THP conforms to the USF&WS guidelines and 14CCR 919.9 (e). Methods to avoid take of NSO include locating the birds, seasonal restrictions, restrictions based on proximity to NSO activity centers and prohibitions on reducing acres of habitat below thresholds determined by USF&W and the Rules of the Board of Forestry. Because this THP will not result in take and conforms to USF&WS guidelines, cumulative negative impacts are avoided. The effects of the proposed operations cannot accumulate with effects of past or foreseeable future projects to negatively impact NSO. Additional information on the Spotted Owl has been attached in Section II and Section V of the plan.

Marbled Murrelet (Brachyramphus marmoratus). Status: California - Endangered (1992), Federal - Threatened (1992). In California the species ranges from the Oregon border south to Santa Cruz County. Specific nesting habitat of this species is large, older, sometimes decadent trees (Carter and Erickson 1988, and others). Although marbled murrelets have been found nesting in some cases in younger trees, and also on the ground, they have primarily been found nesting in over mature coniferous forest throughout most of their range (Carter and Erickson 1988, Paton and Ralph 1988, Hamer and Cummins 1990, 1991. Throughout most of the year this species is found in small groupings in near shore coastal waters where they feed on small baitfish. Habitat loss, gillnetting, and catastrophic events such as oil spills and wildfire are potential threats to this species.

Department of Fish and Game biologists using radar near where the Annapolis Road crosses the South Fork and Wheatfield Fork also suspect that murrelets fly up the Gualala River although at this time murrelets have not been visually confirmed. Private biologists working for landowner have conducted

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

extensive surveys along the South Fork Gualala River and at the confluence of the North Fork and South Fork. The nearest known Murrelets are approximately 5 miles south of the THP area near Clipper Mill Bridge. CDFW documented these birds in 1999 and recent information indicates they may still be in that area.
Surveys for this species were conducted in 2013 and 2014 along the mainstem South Fork Gualala, and potential habitat structure was surveyed again in 2017 and 2018 at the confluence of the North Fork and South Fork near the Green Bridge. No Murrelets were detected during these surveys and the habitat available within the THP area is not conducive to murrelet nesting.

Osprey (Pandion haliaetus). Status: California - Special Concern. The range of this species in California is the northern portion of the state where their nest sites are associated with large fish-bearing bodies of water. In the north coast region this species is a common summer resident and breeder; but rare in winter (Harris 1991). Typical habitat consists of large, elevated trees or artificial structures for nesting within a few kilometers of a fish source (Johnsgard 1990). Although ospreys are most often very tolerant of human activity and often nest adjacent to roads and other conspicuous locations, disturbance of nest sites during the nest season (April-early October) can cause nest abandonment.
Osprey nests have been continually monitored on landowner's property since at least 1975. There are no known nests within the buffer zones given under FPR 919.3b(5) for this species. There are several known osprey nests clustered around the mouth of the Gualala River. There are also at least five known nests facing the Pacific Ocean either on the German Rancho side of the Gualala or on the north side of the Gualala in China Gulch. None of these nests are close to any units of this plan. There have historically been nests along the south fork of the Gualala and up Buckeye Creek but at this time there are no known occupied nests in those areas.

PART OF PLAN

Great Blue Heron (Ardea herodias) Status: California - Special concern- In California this species ranges throughout most of the state up to approximately 4,900' above sea level, with heronries scattered throughout northern California (Zeiner et al. 1990b). Great blue herons inhabit a wide variety of freshwater and salt water habitats. Foraging areas include coastal bays, lagoons, tidal flats, mud flats, and rocks along rivers, creeks, ponds, and lakes (Yocom and Harris 1975) and also agricultural lands and along watercourses in mountainous areas. Their heronries are often found in brush, on rocks and ledges, or on the ground, but they prefer groves of trees near feeding areas (Zeiner et al. 1990). Individual large trees are sometimes used by single pairs of herons as well. Threats to this species include alteration of habitat through development and harvesting or inadvertent destruction of nest trees.
The birds are often seen foraging along the larger forks of the Gualala River. The main concern with this species would be protection of a nesting colony from disturbance although these species are known to nest singly as well. A heronry or individual heron nest should have been visible during the THP layout and none were observed. An individual heron nest is often placed in the largest tree around and since the 13 largest trees per acre in the near stream environment are being protected on this plan any possible nest sites will be protected.

Great Egret (Casmerodius albus). Status: California- Special Concern- In California, the range of great

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

egrets is widespread throughout the state except at high elevations, and in desert areas (Brown et al. 1986). The specific habitat of this species is nearly synonymous with that of the great blue heron, with the two species often foraging and breeding in close proximity. After severe population declines around the turn of the century due to the harvest of their feathers, populations have rebounded. Alteration or draining of wetlands habitat, as well as industrial or residential development are considered threats to the continued well being of this species.
As with great blue herons, no great egret rookeries are known in the BAA. No egrets or nests were observed.

Vaux's swift (Chaeturi vauxi)- California species of special concern- The range of this species in California is the length of the state in migration, and breeding in a narrow coastal belt from Del Norte County south to Santa Cruz County. On the north coast the species is considered a common summer resident and breeder; casual in winter (Harris 1991). Specific habitat for this species includes hollow trees, snag-tops with cavities, and also chimneys for nests and roosts. The removal of old, decadent redwoods and Douglas-firs with hollow snag-tops can cause loss of nesting habitat for this species. Vaux's swift have been regularly observed over the Gualala River. Snags and large decadent trees for roosting or nesting will be protected. No large decadent trees or snags will be felled (unless they are a safety hazard) that might provide habitat for this species. Within the boundaries of this THP there are no known Vaux's swift nests.

Purple Martin (Progne subis)- California species of special concern- In California, the range of purple martins is throughout the state west of the desert regions from sea level to approximately 6,000' above sea level. Purple martins are most commonly observed near coastal lowlands near river mouths. Harris (1991) lists this species as an uncommon summer resident and breeder. Specific habitat of this species for breeding is abandoned woodpecker cavities in isolated tall trees or snags, man-made martin houses (Allen and Nice 1952), or on cliffs (Bent 1942). Although apparently once a common breeder in this region, populations have decreased due to competition from introduced starlings, removal of snags, and loss of riparian habitat (Remsen 1978, Zeiner et al. 1990b). No Purple Martins were observed. Their preferred habitat will be protected by not harvesting snags or large decadent trees (live culls).

Sensitive Mammal Species

PART OF PLAN

Gray Wolf (Canis lupus) Status-California- Endangered
Range in California-Although gray wolves formerly inhabited California, their historic abundance and distribution is unclear (Schmidt 1991, Shelton and Weckerly 2007). While there are many anecdotal reports of wolves in California, specimens were rarely preserved. The historic range of the wolf in California has been reported to include the Sierra Nevada, southern Cascades, Modoc Plateau, Klamath Mountains, and perhaps the North Coast Ranges (Stephens 1906; Grinnell et al 1937; Hall 1981; Paquet and Carbyn 2003). However, Schmidt (1991) concluded that wolves also "probably occurred in the Central Valley, the western slope of the Sierra Nevada foothills and mountains, and the Coast Ranges of California until the early 1800s, although their population size is unknown and may have been small."
Habitat- The gray wolf is a habitat generalist, and can occur in deserts, grasslands, forests and arctic tundra. Habitat use by gray wolves is strongly correlated with the abundance of prey, snow conditions, absence or low livestock densities, road densities, human presence and topography. Actual dens are

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT

usually constructed for pups during the summer period. When building dens, females make use of natural shelters such as fissures in rocks, cliffs overhanging riverbanks and holes thickly covered by vegetation. Sometimes, the den is the appropriated burrow of smaller animals such as foxes, badgers or marmots. An appropriated den is often widened and partly remade. On rare occasions, female wolves dig burrows themselves, which are usually small and short with 1–3 openings. The den is usually constructed not more than 500 meters away from a water source, and typically faces southwards, thus ensuring enough sunlight exposure, keeping the denning area relatively snow free. According to CDFW information titled California's Known Wolves Past and Present (February 2020) the gray wolf is moving back into northeastern California in small but increasing numbers. Two wolf packs identified as the Lassen and Shasta packs are known. The Shasta pack is thought to be no longer operating as a pack. Other wolves fitted with tracking collars that are known to be or known to have been in California include (OR7), (OR25), (OR54, now deceased), (OR44) and (OR59, now deceased). Other contemporary wolf sightings have been reported in Siskiyou, Modoc, Lassen, and Plumas counties.

There are no known wolves near the THP. Habitat is poor in the vicinity of the THP because of the lack of prey species, particularly deer, which would be the main prey species available in California. See Section II for protection measures.

Point Arena Mountain Beaver (Aplodontia rufa nigra)- Federal- Endangered

This species is found along streams in dense, riparian-deciduous forest and open stages of most forest types near water. Needs dense understory vegetation and friable, moist soils for burrowing into. WLPZ measures applied properly should protect their food, i.e. herbaceous and deciduous vegetation and the moist, friable soils important for denning. According to "California's Wildlife" Volume III mammals, this THP is south of their range. Their burrows are described in the Audubon field Guide as being up to 19" in diameter surrounded by fan shaped earth mounds and in wet areas a tent of sticks erected over entrances. No such burrows or structures were observed in the WLPZs. This species has never been known to occur on landowner's property.

Sonoma Tree Vole (Phenacomys longicaudus). Status: California - Special concern.

The range of this species in California includes coastal forests in the humid fog belt (Jameson and Peters 1988) south to Sonoma County on the coast and to Mendocino County in the coastal mountains, and east to Trinity County (Maser 1966). They have been located at elevations of from 150'-3,100' above sea level (Maser 1966). The habitat of this species predominantly includes the existence of Douglas-fir trees, with grand fir, Sitka spruce, redwood and western hemlock also used (Meiselman 1987, Williams 1986). Some authors have suggested that this species is associated with old growth or fairly dense mature forest with large trees (Carey et al. 1991, Williams 1986). However, habitat records reviewed by Maser (1966) suggested that this species also uses young second growth Douglas-fir trees 7"-15" DBH, and also habitats described as broken, isolated, and scattered by clearcuts, open grassland, bracken fern and cultivated fields; or 30-50 year old stands with a few interspersed older trees, but little evidence of dense forest. It is known from the experience of foresters working for GRT that Sonoma Tree Voles also nest in redwood trees, Bay Laurel trees and snags and are often found near water on GRT property. There also seems to be an affinity for nesting near waterfalls, perhaps because of the higher humidity in the vicinity of a waterfall since this species gets all of its moisture from the vegetation it consumes. Numerous tree voles have been documented and protected in the last ten years on the landowner's property.

Pacific Fisher (Martes pennanti)

The range of the Pacific fisher in California is the Pacific coastal range, Siskiyou range and Sierra Nevada

PART OF PLAN

Mountains. Primarily nocturnal, the pacific fisher is a good climber and swimmer. Its home range on the California coast can be up to 3,700 acres for females and 14,000 acres for males. The fisher prefers stands with large trees and high canopy closure. Douglas fir and true fir were the preferred forest types in the Coast Range. Oaks, especially black oaks appear to be important for denning in some areas. Its main quarry is hares, porcupines, squirrels, mice, chipmunks, carrion, fruit and other plants. It dens in hollow trees, logs or rocky crevices. It has natal denning areas and once kits are old enough they are moved to maternal denning areas. The natal period occurs as early as March 1 and extends to May 15th. Maternal denning occurs from May 16th and is usually completed by July 31st.

Resting areas include large limbs, raptor or squirrel nests, and mistletoe brooms. The fur is especially prized which has caused its extirpation in some areas. It requires extensive wilderness, so loss of habitat has also depleted populations. One threat to fishers may be the loss of large decadent trees that contain cavities that are used for natal and maternal denning.

No fishers have ever been detected within the GRT ownership. Within the watershed, loss of large decadent features that would be used by fishers occurred mostly at the turn of the century and again in the 1950s and 1960s.

PART OF PLAN

Pacific Fisher Analysis

Regulatory mechanisms that exist to protect habitat and structural elements for existing fisher populations within the planning watershed and the need to provide additional mitigation measures.

The ASP rules require leaving the 13 largest trees per acre near Class I and large Cass II watercourses. These are the trees that are most likely to have features that are most conducive to fisher denning. These areas are also equipment exclusion zones which reduces the possibility of disturbance. Both Class I and Class IIs have zones adjacent to them that are no-harvest zones and these often have the largest trees in the watershed which are protected from harvest. Also snags are generally left across the entire landscape unless they create a safety concern. GRT will continue a policy of leaving at least two wildlife trees per acre across the property. These trees are evaluated by foresters and chosen based on qualities such as cavities, large size, platforms, busted tops, large branches, which are many of the same qualities that fishers prefer for denning and for resting. GRT will continue to leave hardwoods 24 inches DBH or larger up to four trees per acre and all downed large woody debris within WLPZs are left. Most large woody debris outside of WLPZs is also left unless it is being used for creek restoration work.

Measures that have been incorporated in this THP to avoid take include:

A. leaving of all snags that aren't a safety risk;
B. marking of two wildlife trees per acre which are those trees that have the characteristics that fishers prefer such as forks, cavities, busted tops, nests, mistletoe brooms or decadent trees with large flat branches; and
C. Leaving all large hardwoods (24" or greater) up to 4 per acre.

The specific requirements for fisher regarding structural elements for denning and resting sites within the Plan area.

As mentioned above the fishers need large trees and snags with cavities, large limbs, downed logs, witches' brooms, for both denning and resting. Since this THP is in the redwood belt there exist many

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

hollow old growth redwood stumps in addition to decadent Douglas fir trees and large woody debris scattered across the plan area.

Existence of large scale habitat plans on or near the proposed Plan area.

Across the landscape the existence of numerous alluvial flats adjacent to the Class I watercourses on this property provide linearly connected habitat corridors where all of the best elements needed by fishers are provided for. These elements are contiguous with class II large and standard protection zones which also provide habitat and with areas of no-cut or selectively cut zones that provide additional habitat. Even the evenaged management units on the property provide habitat in the form of down logs and foraging opportunities by supporting a greater number of small mammal prey species.

Anticipated change in fisher habitat quantity and quality within the planning watershed and biological assessment area as it relates to possible future projects.

It is projected that fisher habitat on GRT property will actually improve over time since structural elements that fishers prefer are mostly not harvested. There will be some loss of large snags as these deteriorate over time however the large redwood snags and goose pens are likely to be present and relatively stable for long periods of time into the future. Some snags of existing live trees will develop over time. In addition, the stands that exist on alluvial flats, which are quite extensive on this property, will have only light harvesting of the smaller trees in the future and the largest and oldest trees will continue to age slowly, developing old growth qualities eventually.

PART OF PLAN

Townsend's big-eared bat (Corynorhinus townsendii)

(note: the following was taken from CWHRS Townsends Big Eared Bat by J. Harris, and updated by pers. comm., M. Baker, Nov. 12, 2015)

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Townsend's big-eared bat is found throughout California, but the details of its distribution are not well known. This species is found in all but subalpine and alpine habitats and may be found at any season throughout its range. Once considered common, Townsend's big-eared bat now is considered uncommon in California.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Small moths are the principal food of this species. Beetles and a variety of soft-bodied insects also are taken. Captures their prey in flight using echolocation, or by gleaning from foliage. Flight is slow and maneuverable. Capable of hovering.

Cover: Requires caves, mines, tunnels, buildings, or other human-made structures for roosting. COTO are also known to roost in basal hollows of large trees (>42" dbh) or perhaps stumps if the stumps are closed at the top. The roost entrance in in buildings, caves, and mines has been reported to be as small as 1 square foot in size (Pierson & Rainey 1998). The roost entrance in basal hollows has been reported ranging from 1 to 5.9 feet wide, and 2.6 to 14 feet high in size (Fellers & Pierson 2002). Basal hollow roost entrances greater than 2 square feet that extend 1 foot or more upward into the tree above the top of the entrance to buffer changing microclimates and are greater than 3 feet above the ground for protection from predators. The only light penetrating the roost area originates from the roost entrances so that the internal roost area remains semi-dark to dark, however COTO are also known to roost in complete darkness and away from cave and mine entrances to roost also. COTO roost in a range of light conditions in anthropogenic

RECEIVED
MAR 16 2021
COAST AREA OFFICE

PART OF PLAN

structures and in basal hollows.

COTO may use separate sites for night, day, hibernation, or maternity roosts. Hibernation sites are cold, but not below freezing. Individuals may move within the hibernaculum to find suitable temperatures. Maternity roosts are warm. Roosting sites are the most important limiting resource. Disturbance of roosts is noted as the reason for the species' recorded population declines.

Reproduction: Maternity roosts are found in caves, tunnels, mines, and buildings. Small clusters or groups (usually fewer than 100 individuals) of females and young form the maternity colony. Maternity roosts are in relatively warm sites.

Water: Drinks water. Relatively poor urine-concentrating ability in comparison to other southwestern bats.

Foraging Pattern: Prefers mesic habitats for foraging. Gleans moths from trees, shrubs, or bushes. COTO also feed along habitat edges, including riparian corridors along streams and smaller tributaries, forest edges, and occasionally in more open habitat with large shrubs and scattered trees.

SPECIES LIFE HISTORY

Activity Patterns: Nocturnal. Hibernates. Peak activity is late in the evening preceded by flights close to the roost. Bats at hibernacula from October to April.

Seasonal Movements/Migration: This relatively sedentary species makes short movements to hibernation sites. Of 1500 banded bats, the longest movement was 32.2 km (20 mi) (Pearson et al. 1952).

Home Range: In early studies it was reported that colonies usually are at least 16-19 km (10-12 mi) apart. A density of 1 bat/126 ha (1/310 ac) was reported on Santa Cruz Island (Pearson et al. 1952). The greatest traveled distance recorded for a banded individual is 64 kilometers (Kunz 1999). This species shows high site fidelity if undisturbed. Territory: Not territorial. Males are solitary in spring and summer. Females form maternity colonies. Hibernates singly or in small clusters, usually several dozen or fewer.

Reproduction: Most mating occurs from November-February, but many females are inseminated before hibernation begins. Sperm is stored until ovulation occurs in spring.

Gestation lasts 56-100 days, depending on temperature, size of the hibernating cluster, and time in hibernation. Births occur in May and June, peaking in late May. A single litter of 1 is produced annually but not all females reproduce every year. Young are weaned in 6 wk. and fly in 2.5-3 wk. after birth. Growth rate depends on temperature. The maternity group begins to break up in late August. Females mate in their first autumn, males in their first or second autumn. About half of young females return to their birth site after their first hibernation. Subsequent return rates are 70-80%. Maximum recorded age is 16 years.

Niche: Forages with many other species. Relatively specialized on moths, and slow, maneuverable flier. Gleans, and captures prey in the air by echolocation. Roosting sites may be shared with other species. Rabies is found in this species, but incidence is usually less than 1%.

Comments: This species is extremely sensitive to disturbance of roosting sites. A single visit may result in abandonment of the roost. All known nursery colonies in limestone caves in California apparently have been abandoned. Numbers reportedly have declined steeply in California. Especially sensitive to injury by wing banding (Humphrey and Kunz 1976).

Specific to this THP-Although this THP is within the historic range of the Townsends big-eared bat (COTO) no bats of this species have ever been known to occur on GRT property and there are no caves, mines, or abandoned buildings within the THP, which are currently considered the preferred habitat based on available literature; however, no targeted COTO surveys have taken place. Within the THP area there are large old snags and large old growth redwood stumps that could contain hollows sufficient for roosting. During layout of the plan no evidence of COTO was found which, given that COTO are widespread, but

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

low-density in California and bats are nocturnal and cryptic in general, may be expected outside of targeted survey efforts by bat biologists.

PART OF PLAN

Measures that have been incorporated in this THP to avoid take are:
1. Leaving of all snags and goosepens.
2. Carefully inspecting large basal hollows.
3. Leaving thirteen largest trees per acre in all flood prone areas and leaving all large hardwoods.

Biological Concerns and Significant Wildlife Features Assessment-

Hardwood Cover-
Hardwoods are an important component of wildlife habitat, providing suitable opportunities for roosting and nesting substrate and food production. Hardwoods are evident throughout the BAA in moderate concentrations. There are some unique and extensive areas of large Bay Laurel trees on this THP. All of these areas in the F.P.A. will be protected and are usually in no-cut areas of the plan. There are virtually no tanoak on the alluvial flats because of the periodic flooding that occurs but there are some areas of red alder. In the selection units of this plan only marked trees will be harvested so virtually all of the hardwoods that exist at present will remain post-harvest since none have been marked for harvest.

Within the Biological Assessment area there are some areas of dense hardwoods. In recent years, forest management activities have become more intensive (planting, pre-commercial thinning and hardwood reduction) and have tended to favor the more valuable coniferous species. This has resulted in a gradual decrease in the relative percentages of hardwood to conifers within the ownership. Hardwoods throughout the ownership may be more prevalent than prior to 1900 when conifers were harvested and hardwoods were left for economic reasons. Hardwoods have been preserved in WLPZs throughout the assessment area and within protection zones for wildlife species.

Hardwood cover is important for many species of wildlife and WLPZ protections and other no-cut areas will preserve a diversity of tree species. In addition to these set aside areas mature hardwoods will continue to exist within uneven aged management areas. Even in the clearcut areas some hardwoods will reproduce during the stand rotation period and although large mature hardwoods provide the most mast and the best nesting sites, some benefits will be provided by these younger hardwoods that reestablish themselves. The landowner makes an effort to leave hardwoods (trees 24" and larger) as wildlife trees, with a retention of at least 4 large hardwoods per acre where they exist so that the young conifers will have adequate light to grow. Wildlife trees are chosen based on the following qualities when available; conky or defective trees that are likely to become snags; trees with cavities, forked tops, large branches or loose bark; less common species such as chinquapin, madrone, maple, bay laurel, dogwood, nutmeg, alder or any oak besides tanoak; trees with any type of nest; and hardwood trees with a large diameter.

Multi-Story Canopy-
The proposed silvicultural prescription is primarily selection with extensive no-cut areas along watercourses

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

and one unit of even aged management. The stands in the plan area are relatively even aged, single-tiered, and within the FPA have high canopy retention standards as prescribed by the ASP Rules along the streamside no cut Core area and Inner Zone A. This high canopy retention will likely result in little or no redwood sprout reproduction occurring following harvest within Inner Zone A. Thus, within Inner Zone A of the FPA it may take several decades to a century or two before a multi-story canopy can be developed. Within Inner Zone B of the FPA a more open canopy will occur but silviculture must be via thinning from below, so this discourages the development of a multi-story canopy. Outside the FPA within the selection areas, a multi-story canopy will be created over time as trees of all size classes are harvested and canopy gaps will be filled with sprouting redwoods where they currently exist and are harvested. At the watershed level there is extensive variability in stand ages, composition, and structure that will provide for multi-story development.

PART OF PLAN

Road Density-

Except for mainline (i.e., designated permanent) roads, the majority of the roads in use within the BAA are native soil surfaced roads. These roads are maintained on an "as needed" basis. Main haul roads are subject to low to moderate truck traffic during logging season. The landowner is in the process of refining its road system by gradually abandoning a portion of the old roads that parallel Class I and Class II watercourses to the degree possible depending on access, and on steeper slope areas with appropriate access and good lift of logs where cable logging can be conducted. Rerouting the upslope road systems to facilitate cable yarding systems when possible and where practical and moving roads to locations above and away from watercourses will ultimately reduce future potential road impacts. Also, a large percentage of the road system on GRT's ownership has been made hydrologically disconnected from watercourse over the last fifteen years through use of GRWC implemented cost share watershed restoration grants. Many other roads within the BAA over any given year are only subject to infrequent use by GRT's forest management staff. During the rainy season much of the assessment area is inaccessible and receives no traffic. The effect is a only limited seasonal road use affecting wildlife during the logging season and results in little to no potential impacts over the balance of the year.

This project will not interact with past, present or future levels of road density and use, and will not cause or create a significant adverse impact on animal use patterns in the assessment area.

Rock Piles or Cliffs-

There were no cliffs or significant rocky areas in the THP area. Because of the geology of the area cliffs are very rare on the GRT ownership.

Ponds and other wet areas- There are two ponds in the project area. There may be a few other areas that hold water during heavy rain events within the flatter portions of the plan but because of the sandy nature of the soil most of these dry up soon after the rain stops. Within the assessment area there are some back tilted areas that trap water for extended periods and may provide some habitat.

Woody Debris-

Large woody debris is important for maintaining moisture for amphibians and for providing shelter for other small animals and insects. Large woody debris also stabilizes sediment and may provide shelter for young

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

trees. The THP does contain large woody debris scattered randomly throughout the units. NO large woody debris within the WLPZs shall be removed.

Nests-

No nests besides the common squirrel nests were discovered during plan layout. No raptor nests were discovered during plan layout. All fallers shall be informed to leave trees in which nests or nest holes are observed and report these sightings to the RPF to determine if a listed or protected species is occupying the nest, and if this is the case the protection measures in Section II, Item 32 will be followed.

Snags and Decadent (live culls) Trees-

Snags have not been numerically tallied and even when pre-harvest numbers are available it is difficult to estimate how many snags will survive falling operations. A few large redwood chimneys (hollow snags) exist on this plan and will be protected as wildlife trees. Mitigation for this plan is to retain all snags and large decadent trees (live culls) that don't represent a safety risk.

PART OF PLAN

Late Successional Forest and Large Tree Analysis-

Individual effects on wildlife and cumulative effects of the loss of late successional forests and individual large trees through evenaged management or because of repeated entries from uneven aged management have been recognized by the Board of Forestry and addressed by memorandum to RPFs ("Disclosure, Evaluation and Protection of large old trees" Duane Shintaku 2005).

Some of the issues relating to the reduction of large old trees are,

1) loss of late succession stands and late succession continuity;

2) loss of decadent and deformed trees that are of special value to wildlife by providing nesting platforms, nesting cavities for birds as well as basal cavities for mammals;

3) loss of high quality downed large woody debris recruitment;

4) loss of other special habitat elements such as loose bark that provides for bat roosting sites and nest sites for smaller birds, perching opportunities for aerial hunters, foraging opportunities for woodpeckers and other insect eaters, territorial perches, etc.

The greatest impact to a late successional and larger tree resource occurred nearly 100 years ago with the logging of the old growth in the BAA. The goal of modern forestry is to maintain the elements of this habitat type that remain and recruit additional elements while still harvesting timber products.

No late successional stands remain on the GRT ownership. What does remains of the late seral forest on this ownership is scattered old growth trees that have been left for the following reasons;

1) They are rotten, hollow or busted and previous entries did not take them because of the lack of economic value.

2) They are sound but hanging over Class I or Class II watercourses where the current Rules protect them from harvesting for the sole intention of eventual LWD recruitment into the stream or river.

3) They are sound but are on an unstable area or in an area that is inaccessible

4) They contain a known nest site, have some other significant wildlife value, or are being left as part of a

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

wildlife habitat retention area or grouping.

By far the most common reason for the existence of sound late seral trees that are still on the property is that they are located leaning over watercourses, especially adjacent to the Gualala River but also many of the main tributaries have scattered residuals leaning over watercourses. Sound late seral trees that are outside of a WLPZ are very rare. Usually these trees are residual old growth that were suppressed and are no larger than the surrounding second growth and have little unique wildlife value. No numbers have been collected regarding the number of residual large old trees per acre across the property, but the number is very likely far less than 0.1 per acre (considering conifers only).

PART OF PLAN

Recruitment of Future Late Seral Elements

Wildlife agencies are concerned that some trees be recruited over time so that the special habitat elements that late seral trees provide do not continue to decrease because of the loss of the existing trees through mortality and decay. There are several ways that the Rules accomplish this;

1) The 2009 Salmonid (ASP) Rules require the thirteen largest trees per acre within the Class I and large Class II watercourse protection zones be left.

2) The ASP Rules also require that the first 30 feet adjacent to a Class I and variable widths adjacent to Class II watercourses be no-cut zones.

3) Large trees on landslides and on the edges of landslides are often left.

4) Some of the largest trees on the property are in inaccessible areas including where the lean over watercourses and are difficult to reach without damaging the watercourse.

5) Much of the timber on GRT ownership is 65 to 105 plus year old second growth, and on the higher site areas these can be large trees (40" DBH and lager). The largest of these trees are often Douglas-fir and many of these Douglas-fir trees are infected with stem rot as a result of past logging injury or just as a result of natural spread of tree stem fungus as the forests mature. As Douglas-fir trees make better wildlife trees than comparably sized redwood trees, and because they have lower economic value (and infected trees have little economic value), these are the priority trees to be marked as retention wildlife trees. GRT has an internal policy is to mark a minimum of four trees per acre as wildlife trees or recruitment trees where feasible. The largest trees with defects are the highest priority to retain. These trees often occur in upslope areas therefore protecting residual trees that are outside of the WLPZs, where many large trees are required to be left for shade canopy.

6) GRT will continue to leave hardwoods (up to 4 per acre) that are 24" or larger. Many hardwoods in this size class are older trees and most of these have high value as wildlife trees. Additionally, all hardwoods in WLPZs are left.

Findings- Although late seral stands as defined by the Forest Practice Rules were eliminated from the GRT property almost a century ago (although some may have existed as long as 50-60 years ago in the easternmost portions of the property) some late seral conifer elements still remain. The large residuals trees described above are often found adjacent to Class I watercourses or as large decadent residuals scattered widely over the property. Older hardwood trees are found scattered on the upslope areas as well

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

as along the watercourses.

Present timber harvests generally do not disturb these late seral remnants, unless they are deemed a safety or fire hazard issue. Although large second growth trees are harvested, the Forest Practice Rules regarding WLPZ protection and GRT policies regarding wildlife tree retention are ensuring that many large second growth trees are being left on a per acre basis as well. As an example, every residual tree that has been left in a clearcut, along a designated Class I and Class II watercourse WLPZ and Class III watercourse channel zone, on landslides, on or within protected archaeological sites, around rare plants and wet areas, or left for any number of other reasons will most likely remain until the next scheduled harvest entry onto the site. Under a selection harvest regime this can be a 15-25 year span, and on areas where even-aged management is occurring this is at least 60 years. In each subsequent harvest entry where such structure is being retained these residual trees and/or retained structure continue to grow taller and older. In addition, on the GRT ownership there are many areas of highly productive timberland that are growing 80-100-year old trees. The trees growing on these higher sites have attained very large diameters and height, and though they don't have all the characteristics of old growth trees when they are left for retention purposes, they may will attain those characteristics in time.

The few late seral type large trees that have been observed in the plan area are immediately adjacent to the Gualala
River in the Core Zone and in the Inner Zone A are being retained as wildlife trees and are a source of eventual LWD recruitment to the river and flood prone area. Requirements are included in Section II, Item 26 and Item 32 to make sure that fallers attempt to protect these trees when falling adjacent timber.

Note- Although wildlife trees are not normally specifically marked in uneven aged units the landowner has agreed to mark any especially valuable wildlife trees in order to make fallers aware of their location. This marking designation will help to protect these retained trees from impacts during falling and harvesting.

The managed second growth stands, combined with retention of residual later serial forest elements existing today within the BAA do provide some functional wildlife habitat for species primarily associated with late seral forest, in spite of the fact that previous management activities were not designed to retain any particular characteristics. This THP is designed to retain important functional wildlife habitat elements such that they will be present in the future stands. Late seral structural components are also expected to increase more rapidly within the flood prone areas and WLPZs in the BAA due to the lighter thinning there that will allow trees to grow larger in size and develop more late seral characteristics. No significant long-term cumulative adverse impacts to the functional wildlife habitat of species primarily associated with late seral forest characteristics is likely to occur as a result of activities on this proposed THP.

Biological Findings: Operations proposed under this THP do not have a reasonable potential to join with the impacts of other projects to cause significant cumulative adverse biological impacts. This is due primarily to the limited impacts of light selection harvesting on the FPA stream protection zones, protection measures for plants and listed species included in Section II, Items 26 and 32 of the plan, requirements to survey for current and future listed species and protection of listed species that occur on or near the plan and within the BAA during timber operations.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Rare Plant Survey and Scoping Process

Summary of Rare Plant Survey- The rare plant scoping process has been completed for this plan. The survey will be conducted to cover as much of the blooming season as possible prior to operations and results will be reported to CDFW for their input. The latest survey protocols (2018) will be used.

Project and site description

- **Description of the proposed project-**
  The project is a 251 acre harvest plan of which 199 acres will be harvested using single tree selection and 52 acres will be protected no cut areas or non-timber areas. The plan is adjacent to the Little North Fork of the Gualala which flows into the main stem of the Gualala river. See third bullet point below and section IV of the THP (cumulative impacts analysis) for more details.

- A detailed map of the project location and study area that identifies topographic and landscape features and includes a north arrow and bar scale.

  A rare plant survey map showing the project area and the survey route will be included after the plant survey is finished. Also see section II maps for greater detail of the plan area.

- A written description of the biological setting, including vegetation and structure of vegetation; geological and hydrological characteristics and land use and management history.

  The harvest area is located in Mendocino County in the Doty Creek Planning Watershed. The THP covers 251 acres adjacent to a class I watercourse. Elevations within the plan range from approximately 40 feet to 1,20 feet. Aspect is in all directions. Yarding will be ground based.

  Elevations within the plan range from approximately 40 feet to 440 feet. Aspect is mostly flat or east and west facing. Yarding will be ground based. Soils for the THP area is mostly Big River Loamy Sand but there are areas of Irmulco Tramway complex, DeHaven Hotel complex and Cottaneva Loam complex. Topography is mostly flat in Units #1 and #2 and fairly steep in Unit #3. EHR is moderate and high. Vegetation is mostly second growth redwood and alder with some Douglas Fir in the upslope areas. Because of the high canopy cover there is very little understory. There are several wet areas.

PART OF PLAN

Detailed description of survey methodology and results

• Dates of field surveys (indicating which areas were surveyed on which dates), name of field investigator(s), and total person-hours spent on field surveys;

The survey will be conducted at a seasonally appropriate time.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

The RPF has conducted the rare plant surveys for most of the THPs written by him (approximately 2 to 3 plans a year for the last 17 years) on Gualala Redwoods Inc and then later on Gualala Redwoods Timber LLC. since botanist Clare Golec's work in 2001.

• A discussion of how the timing of the surveys affects the comprehensiveness of the survey;

The survey will be conducted to cover as much of the blooming season as possible.

• A list of potential special status species or natural communities;

Scoping Process-

PART OF PLAN

The purpose of this document is to identify rare plant considerations in relation to timber management activities for the landowner's ownership and specifically for this THP. These considerations include, the determination of pertinent rare plants, occurrence of and potential habitat for rare plants, potential management impacts to rare plants, and recommended inventory, protection, mitigation and monitoring measures for rare plants. Potential habitat for rare plants will be emphasized in this document as a means to assess rare plants within the ownership. Landowner's ownership is located in southwest Mendocino and northwest Sonoma Counties in California, and situated biologically in the following geographic subdivisions (based on topography, climate and plant communities); the floristic province is the California (CA-FP), the region is the Northwestern California (NW), the two subregions are the North Coast (NCo) and North Coast Ranges (NCoR), and the North Coast Ranges district is the Outer North Coast Ranges (NCoRO) (Hichan 1993). The landowner's ownership is predominately a tree dominated vegetation type of coastal redwood and Douglas-fir. The soils are primarily derived from sedimentary rocks of the Coastal Belt Franciscan Formation (sandstone, siltstone and shale), with old marine sandstone terraces along the coast.

DEFINITION OF RARE PLANT The plants designated in this document as "rare" are the vascular plant species currently protected on both the federal and state levels. These plants have been derived from the following lists: Federal listed or proposed threatened or endangered plants in California, State listed or proposed rare, threatened or endangered plants; California Native Plant Society's (CNPS) list 1A (plants presumed extinct in California); CNPS list 1B (plants rare, threatened or endangered in California and elsewhere); CNPS list 2 (plants rare, threatened or endangered in California but more common elsewhere). These lists meet the criteria for state listing under Sec. 1901, Chapter 10 of the Native Plant Protection Act, or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Codes, and are probable candidates for state listing. The CNPS list 1A, 1B and 2 plants are to be considered in the preparation of documents relating to the California Environmental Quality Act.

RARE PLANT CONSIDERATIONS

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

At present the following rare plants have known occurrence within the ownership,

- swamp harebell (Campanula californica) very common on the German Rancho, fairly rare elsewhere,
- running pine (Lycopodium clavatum) one occurrence,
- coast lily (Lilium maritimum) common on the German Rancho, rare elsewhere,
- Point Reyes checkerbloom (Sidalcea calycosa ssp. rhizomata) one unconfirmed occurrence,
- thin lobed horkelia (Horkelia tenuiloba) at least 4 sites with multiple plants in each site.
- Maple leaved checkerbloom (Sidalcea malachroides) CNPS list 4 one known site with at least two plants,
- and Bolander's reed grass (Calamagrostis bolanderi) CNPS list 4, common in many areas of the ownership)
- Methuselah's beard lichen (Usea Longisima) CNPS list 4, fairly common in older stands of Douglas fir
- White-flowered Rein Orchid (Piperia candida) CNPS 1B.2 one known occurrence

Two categories of rare plants, regional and specific, have been developed based on broad occurrence data and available habitat within the ownership.

Regional Rare Plants-

PART OF PLAN

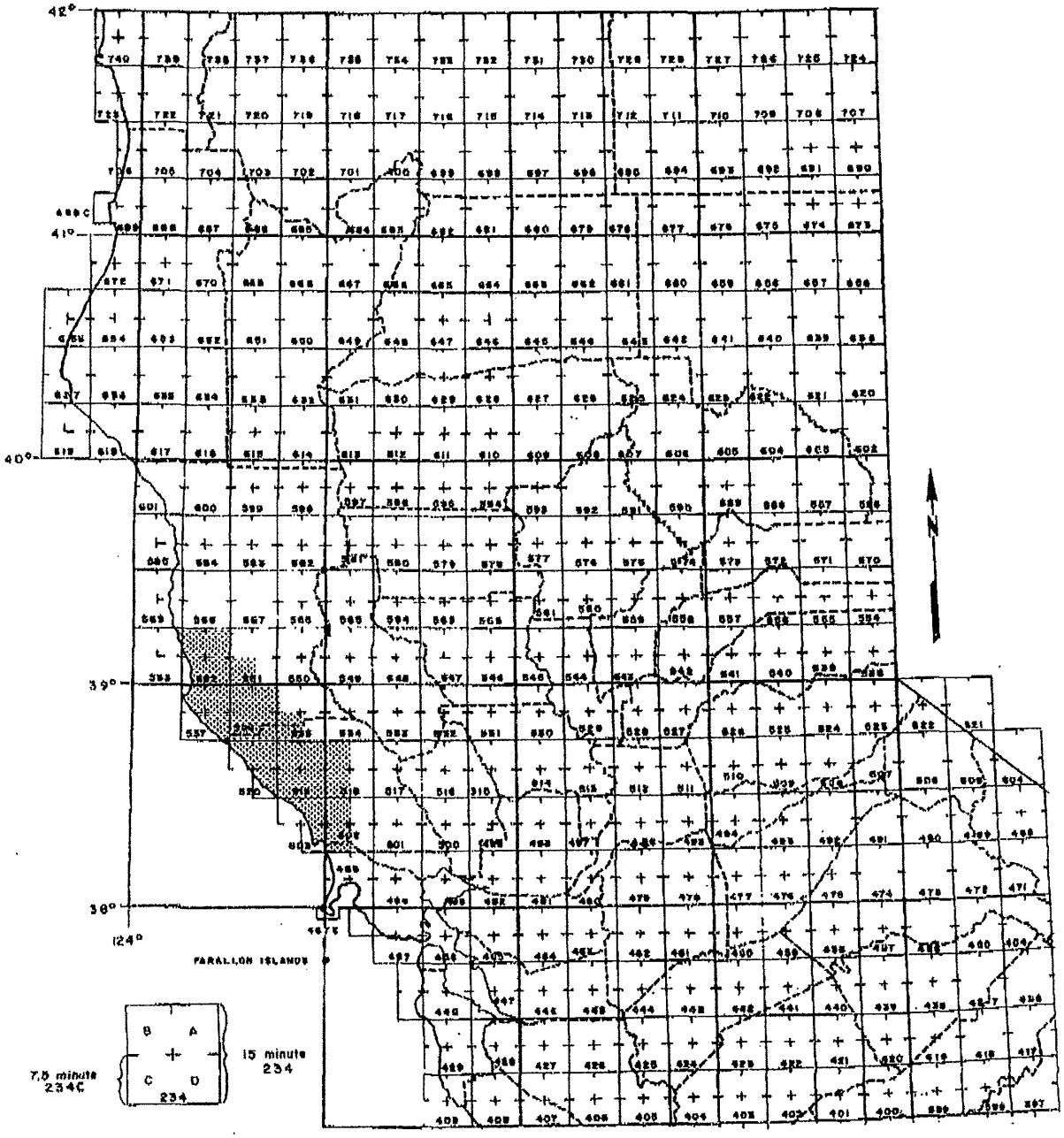
A regional rare plant is defined as a rare, threatened, or endangered vascular plant (federally listed, state listed, and or CNPS list IA, IB & 2) with known occurrence in southwestern Mendocino and/or northwestern Sonoma Counties in California and in the general locale of the ownership. Regional rare plant occurrences are determined by querying the CNPS electronic Inventory of Rare and Endangered Vascular Plants of California (original August, 1997, updated on June 4, 2018) for the ownership and neighboring USGS 7.5' quadrangles. An extensive query area was used to determine regionally appropriate rare plants and to augment floristic survey information. The regional quadrangles queried are listed below by name and number (in accordance with the quadrangle numbering system utilized by California Dept. of Water Resources).

Gualala Redwood Timber Quadrangles: Stewarts Point (520B), McGuire Ridge (536C), Gualala (537D), Cazadero (519D), Duncans Mills (503A)
Regional Quadrangles: Guerneville (518C), Camp Meeker (502B). Valley Ford (502C), Duncans Mills (503A), Arched Rock (503B), Bodega Head (503D), Warm Springs Dam (519A), Tombs Creek (519B), Fort Ross (519C), Annapolis (520A), Plantation (520D), Big Foot Mtn. (535C), Ornbaun Valley (536A), Zeni Ridge (536C), Gube Mountain (536D), Eureka Hill (537A), Point Arena (537B), Saunders Reef (537C), Philo (55IC), Navarro (552A), Elk (552B), Mallo Pass Creek (552C), Cold Spring (552D), Albion (553A)

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Figure 1 **REGIONAL ASSESSMENT AREA**

PART OF PLAN



RECEIVED

MAR 16 2021

COAST AREA OFFICE
RESOURCE MANAGEMENT

Little THP 1/10/21

201

Section IV

Regional Rare Plant List - The query of regional quadrangles resulted in 126 regional rare plants, these are listed in Table 1 by scientific name along with their general habitat affiliations. Although these species are the rare plants with known occurrence in the general locale of the ownership, many of these species do not have suitable habitat available within the ownership.

Rare Plant List specific to habitats found in the area of the THP

Table 3 shows regional rare plants with potential for occurrence in the THP area. This designation was determined by the correlation of the ownership habitats with the associated habitats and distribution of regional rare plants. The potential for occurrence is defined as:

PART OF PLAN

Yes, suitable habitat within the THP
Possible, suitable habitat or possible habitat
No, no habitat available within THP, limited habitat available on ownership or localized occurrence

The rare plants associated with serpentine substrates and with a low potential for occurrence were eliminated. The rare plants associated with serpentine substrates are an unlikely concern as habitat (serpentine substrates) was not noted on soil maps or during field review. The rare plants with low potential for occurrence have questionable or limited habitat available, and/or endemic to a specific area outside the ownership. Many of the immediate coastal plants have limited habitat available (coastal dunes, coastal bluff scrub, coastal prairie) and are not associated with forested areas, and are not likely to be impacted with timber management activities. This does not mean that if any of these plants are detected on the ownership that they will not receive consideration, but reflects that they are unlikely to occur within the THP and/or receive adverse impacts from timber management activities.

OWNERSHIP HABITATS

The vegetation present on the ownership have been grouped into general habitat types that reflect environmental conditions (wetland, mesic or xeric), regional areas (coastal or inland), and vegetative components (grass or forest). These habitat types are in large part based on Holland's (1986) vegetation classification system. The habitat types were determined through aerial photograph interpretation and a cursory field review of the ownership. The habitats identified within the ownership are listed and summarized as follows.

Upland Redwood Forest and Douglas-fir Forest The upland redwood forest and Douglas-fir forest are tree dominated and are associated with the mesic and upland slopes. These are the primary habitats within the ownership and are characterized by coastal redwood, Douglas-fir , grand fir , tanbark oak , evergreen huckleberry, red huckleberry, salal , poison-oak , wood rose , California hazelnut, , redwood sorrel , sword fern , hairy honeysuckle , yerba de selva , Pacific star flower , vanilla grass , Douglas iris , western trillium , evergreen violet , woodland madia , mountain sweet-cicely , wood strawberry , small-flowered alumroot , California toothwort , hillside pea , vanilla leaf , Smith's fairy bells , and bead lily .

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Recent harvested areas and roadsides have additional species such as blue blossom , coyote brush , French broom , white-stemmed raspberry , toothed coast fireweed , hairy cat's-ear , weedy cudweed , purple cudweed , woolly mullien , Spanish clover , wild carrot , common toad rush , self-heal , English plantain , purple-leaved fireweed , shamrock clover , white clover , Italian thistle , common velvet grass , sweet vernal grass , Orchard grass , creeping bent grass , soft chess , ripgut grass , large rattlesnake grass , small rattlesnake grass , silver European hairgrass , annual bluegrass , and tall flat-sedge.

Tan-Oak Forest and Mixed Evergreen Forest

The tan-oak forest and mixed evergreen forest are tree dominated habitats associated with xeric upland slopes. These habitats are often along ridgelines and in the inland areas away from coastal influence and are characterized by species such as, Douglas-fir , sugar pine , tanbark oak , Pacific madrone , giant chinquapin , California-bay , shrub oak , canyon live oak , orange bush monkey flower , spicebush , hoary manzanita , hairy manzanita , common manzanita ,buck brush , deer brush , coyote brush , bear grass , California milkwort , yerba de selva , Bolander's phacelia , woolly sunflower , star lily , Indian pink , and western bracken fern .

PART OF PLAN

Bishop Pine Forest/Chaparral

The Bishop pine forest and chaparral are tree and shrub dominated habitats that frequently intergrade, and are found on the sandy and improvised soils associated with maritime ridgelines and terraces. These habitats, along with the associated marshy ponds, are floristically unique and have known occurrence and a high potential for rare plants. The Bishop pine forest and chaparral can be characterized by species such as, Bishop pine , western Labrador tea , wax myrtle , western azalea , hoary manzanita , glossyleaf manzanita , dwarf chinquapin , California rose-bay , evergreen huckleberry , coast silk-tassle , salal , dwarf rock-rose , wavyleaf ceanothus , California false lupine , bear grass , California fescue , coast lily , grape-fern , western bracken fern , goldenback fern , California milkwort , and bird's-foot lotus.

Alluvial Redwood Forest and North Coast Riparian Forest

The alluvial redwood forest and north coast riparian forest are tree dominated habitats associated with the mesic low elevation areas adjacent to Class I and II watercourses. This habitat type is characterized by coastal redwood , western hemlock , red alder , bigleaf maple , California-bay , Pacific yew , Oregon ash , willows , thimbleberry , salmonberry , Pacific bramble , red elderberry , elk clover , cow parsnip , western coltsfoot , toothed monkey flower , hedge-nettle , stinging nettle , coast figwort , small-flowered nemophila, Siberian candyflower , coast boykinia , lace flower , leopard lily , star solomon's seal , trifid bedstraw, wild ginger , slink-pod, fringed false hellebore, smooth violet, Pacific water-parsley, foxglove, common chickweed, small-flowered bulrush, mugwort, poison hemlock, Pacific snakeroot, western buttercup , Kentucky bluegrass, Bolander rush, common rush, sedges (Carex spp.), common horsetail, common scouring rush, lady fern, five-fingered fern, giant chain fern, and deer fern.

Marshes, Swamps, and Ponds

The marshes, swamps, and ponds are herbaceous and shrub dominated wetland habitats with saturated soils, standing water, and/or slow moving water. These habitats are associated with low spots and backwaters along Class I and II watercourses or depressions in the maritime hardpans of the Bishop pine

RECEIVED
203 MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

forest. Marshes, swamps, and ponds are characterized by many herbaceous species of the riparian forests with additional species such as western Labrador tea, western azalea, slough sedge, broom sedge, bluegrass in the marshy areas of the Bishop pine forest and longleaf pondweed in ponds.

Northern Oak Woodland and Grassland

The northern oak woodland and grassland are tree and herbaceous dominated habitats that frequently intergrade and are limited in occurrence. They occur on portions of the inland ridgelines in the Austin Creek tract of the ownership. Isolated grassland habitats, not associated with oak woodlands, also occur sporadically throughout the inland areas of the ownership. These habitats are characterized by species such as California black oak, coast live oak, Douglas-fir, California buckeye, bracken fern, white hyacinth, Ithuriel's spear, blue dicks, popcorn flower, common yarrow, blue-eyed grass, western blue flax, California poppy, common fiddleneck, stickseed, common catchfly, cinquefoil, sun cup, large-flowered agoseris, spotted clover, bicolor lotus, field bindweed, yellow parentucellia, western buttercup, miniature lupine, sheep sorrel, wild carrot, soap plant, hound's-tongue, cut-leaved geranium, common stork's-bill, rattlesnake weed, scarlet pimpernel, English plantain, baby stars, wild radish, tomcat clover, spring vetch, goose grass, doveweed, wild oats, hedgehog dogtail, large rattlesnake grass, small rattlesnake grass, perennial ryegrass, silver European hairgrass, California oatgrass, fescue grass , and purple needlegrass.

PART OF PLAN

Coastal Prairie

The coastal prairie is a herbaceous dominated habitat associated with openings and terraces along the coast. This habitat has very limited occurrence along western edge of the ownership and was not field reviewed. Coastal prairie is characterized by native bunch grasses mixed with other herbaceous plants. However, many of these areas now support introduced grasses and herbaceous plants.

Coastal Dunes, saltwater Marshes, Bluffs, and Scrub

The coastal dunes, saltwater marshes, bluffs, and scrub habitat types are herbaceous and shrub dominated habitats found along the immediate coastline. These habitats occur only in a very limited area of the ownership, the mouth of the Gualala River, and were not field reviewed.

Potential Rare Plant Impacts

Potential impacts to rare plants within the ownership are addressed in relation to timber management activities. Timber harvesting is the principal activity of landowner and has the greatest potential to impact rare plants associated in or around forested habitats. The potential impacts to rare plants from timber management activities are:

- direct physical impact, resulting from timber felling and removal, road and skid trail construction, or site preparation (such as burning and herbicide spraying)

- indirect impacts, such as expansion, degradation, or loss of habitat, and invasive plant competition

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

- cumulative impacts, resulting from disturbance regimes that favor temporal and pioneer vegetation types

Rare Plant Assessment:

For an assessment of cumulative impacts on rare plants, a review was made of "Gualala Redwoods Inc. Rare Plants Assessment" prepared by Clare Golec, (former) staff botanist for NRM, originally written October 1997 and updated in 2001 to reflect changes in plant listings. The CNPS website was accessed, and a 29 quad search was made on 6/4/2018. From this list Table 1 was created. Table 2 is a list of special status natural communities that occurred in the CNDDB nine quad search. The plants in Table 1 that had habitat requirements similar to the habitat in the plan area were extracted into table 3. In addition, photos of each of the plants in Table 3 was obtained and studied to aid in the survey.

Results of rare plant scoping-

PART OF PLAN

Table 1 **Regional Rare Plants** (made from a 29 quad search)

Scientific Name	Common Name	CNPS_ LIST	Natural communities	Blooming periods	Habitat in the THP N=no P=possible Y=yes
Abronia umbellata ssp. breviflora	pink sand-verbena	List 1B.1	Coastal dunes	Jun-Oct	N
Agrostis blasdalei	Blasdale's bent grass	List 1B.2	Coastal bluff scrub, Coastal dunes, Coastal prairie	May-Jul	N
Allium peninsulare var. franciscanum	Franciscan onion	List 1B.2	Cismontane woodland, Valley and foothill grassland/clay, volcanic, often serpentinite	May-Jun	N
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	List 1B.1	Marshes and swamps(freshwater), Riparian scrub	May-Jul	Y
Amorpha californica var. napensis	Napa false indigo	List 1B.2	Broadleafed upland forest(openings), Chaparral, Cismontane woodland	Apr-Jul	N
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	List 1B.1	Broadleafed upland forest, Chaparral/often serpentinite	Feb-Apr	N
Arctostaphylos bakeri ssp. sublaevis	The Cedars manzanita	List 1B.2	Closed-cone coniferous forest, Chaparral/serpentinite seeps	Feb-May	N
Arctostaphylos stanfordiana ssp. decumbens	Rincon manzanita	List 1B.1	Chaparral(rhyolitic), Cismontane woodland	Feb-Apr	N

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

Scientific Name	Common Name	CNPS_LIST	Natural communities	Blooming periods	Habitat in the THP
Astragalus agnicidus	Humboldt milk-vetch	List 1B.1	Broadleafed upland forest, North Coast coniferous forest/openings, disturbed areas	Apr-Aug	Y
Boschniakia hookeri	small groundcone	List 2.3	North Coast coniferous forest	Apr-Aug	Y
Brodiaea californica var. leptandra	narrow-anthered California brodiaea	List 1B.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland/volcanic	May-Jul	N
Calochortus raichei	The Cedars fairy-lantern	List 1B.2	Closed-cone coniferous forest, Chaparral/serpentinite	May-Aug	N
Calystegia purpurata ssp. saxicola	coastal bluff morning-glory	List 1B.2	Coastal dunes, Coastal scrub, North Coast coniferous forest	May-Sep	N
Campanula californica	swamp harebell	List 1B.2	Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps(freshwater), North Coast coniferous forest/mesic	Jun-Oct	Y
Carex albida	white sedge	List 1B.1	Bogs and fens, Marshes and swamps(freshwater)	May-Jul	N
Carex californica	California sedge	List 2.3	Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps(margins)	May-Aug	P
Carex comosa	bristly sedge	List 2.1	Coastal prairie, Marshes and swamps(lake margins), Valley and foothill grassland	May-Sep	P
Carex lyngbyei	Lyngbye's sedge	List 2.2	Marshes and swamps(brackish or freshwater)	May-Aug	P
Carex saliniformis	deceiving sedge	List 1B.2	Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps(coastal salt)/mesic	Jun	P
Castilleja ambigua ssp. humboldtiensis	Humboldt Bay owl's-clover	List 1B.2	Marshes and swamps(coastal salt)	Apr-Aug	N
Castilleja mendocinensis	Mendocino coast Indian paintbrush	List 1B.2	Coastal bluff scrub, Closed-cone coniferous forest, Coastal dunes, Coastal prairie, Coastal scrub	Apr-Aug	N
Ceanothus confusus	Rincon Ridge ceanothus	List 1B.1	Closed-cone coniferous forest, Chaparral, Cismontane woodland/volcanic or serpentinite	Feb-Jun	N
Ceanothus purpureus	holly-leaved ceanothus	List 1B.2	Chaparral, Cismontane woodland/volcanic, rocky	Feb-Jun	N
Chlorogalum pomeridianum var. minus	dwarf soaproot	List 1B.2	Chaparral(serpentinite)	May-Aug	N
Chorizanthe cuspidata var. cuspidata	San Francisco Bay spineflower	List 1B.2	Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub/sandy	Apr-Jul(Aug)	N

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

Scientific Name	Common Name	CNPS_ LIST	Natural communities	Blooming periods	Habitat in the THP
Chorizanthe cuspidata var. villosa	woolly-headed spineflower	List 1B.2	Coastal dunes, Coastal prairie, Coastal scrub/sandy	May-Jul(Aug)	N
Chorizanthe valida	Sonoma spineflower	List 1B.1	Coastal prairie(sandy)	Jun-Aug	N
Cirsium andrewsii	Franciscan thistle	List 1B.2	Broadleafed upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub/mesic, sometimes serpentinite	Mar-Jul	N
Coptis laciniata	Oregon goldthread	List 2.2	Meadows and seeps, North Coast coniferous forest streambanks/mesic	Mar-Apr	P
Cordylanthus maritimus ssp. Palustris	Point Reyes bird's-beak	List 1B.2	Marshes and swamps(coastal salt)	Jun-Oct	N
Cordylanthus tenuis ssp. capillaris	Pennell's bird's-beak	List 1B.2	Closed-cone coniferous forest, Chaparral/serpentinite	Jun-Sep	N
Cupressus goveniana ssp. pigmaea	pygmy cypress	List 1B.2	Closed-cone coniferous forest(usually podzol-like soil)		N
Cuscuta pacifica var. papillata	Mendocino dodder	1B.2	• Coastal dunes (interdune depressions)	July - October	N
Delphinium bakeri	Baker's larkspur	List 1B.1	Broadleafed upland forest, Coastal scrub, Valley and foothill grassland/decomposed shale, often mesic	Mar-May	N
Delphinium luteum	yellow larkspur	List 1B.1	Chaparral, Coastal prairie, Coastal scrub/rocky	Mar-May	N
Dirca occidentalis	western leatherwood	List 1B.2	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, North Coast coniferous forest, Riparian forest, Riparian woodland/mesic	Jan-Mar(Apr)	Y
Erigeron angustatus	narrow-leaved daisy	List 1B.2	Chaparral(serpentinite or volcanic)	May-Sep	N
Erigeron serpentinus	serpentine daisy	List 1B.3	Chaparral(serpentinite, seeps)	May-Aug	N
Erigeron supplex	supple daisy	List 1B.2	Coastal bluff scrub, Coastal prairie	May-Jul	N
Eriogonum nervulosum	Snow Mountain buckwheat	List 1B.2	Chaparral(serpentinite)	Jun-Sep	N
Erysimum concinnum	bluff wallflower	1B.2	Coastal bluff scrub • Coastal dunes • Coastal prairie	Feb-July	N
Erysimum menziesii ssp. menziesii	Menzies' wallflower	List 1B.1	Coastal dunes	Mar-Jun	N
Erythronium revolutum	coast fawn lily	List 2.2	Bogs and fens, Broadleafed upland forest, North Coast coniferous forest/mesic, streambanks	Mar-Jul(Aug)	Y

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

Scientific Name	Common Name	CNPS_ LIST	Natural communities	Blooming periods	Habitat in the THP
Fritillaria liliacea	fragrant fritillary	List 1B.2	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland/often serpentinite	Feb-Apr	N
Fritillaria roderickii	Roderick's fritillary	List 1B.1	Coastal bluff scrub, Coastal prairie, Valley and foothill grassland	Mar-May	N
Gilia capitata ssp. chamissonis	dune gilia	List 1B.1	Coastal dunes, Coastal scrub	Apr-Jul	N
Gilia capitata ssp. pacifica	Pacific gilia	List 1B.2	Coastal bluff scrub, Chaparral(openings), Coastal prairie, Valley and foothill grassland	Apr-Aug	N
Gilia capitata ssp. tomentosa	woolly-headed gilia	List 1B.1	Coastal bluff scrub(rocky, outcrops)	May-Jul	N
Gilia millefoliata	dark-eyed gilia	List 1B.2	Coastal dunes	Apr-Jul	N
Glyceria grandis	American manna grass	List 2.3	Bogs and fens, Meadows and seeps, Marshes and swamps(streambanks and lake margins)	Jun-Aug	Y
Hesperevax sparsiflora var. brevifolia	short-leaved evax	List 2.2	Coastal bluff scrub(sandy), Coastal dunes	Mar-Jun	N
Hesperocyparis pygmaea	pygmy cypress	1B.2	• Closed-cone coniferous forest (usually podzol-like soil)		N
Holocarpha macradenia	Santa Cruz tarplant	List 1B.1	Coastal prairie, Coastal scrub, Valley and foothill grassland/often clay, sandy	Jun-Oct	N
Horkelia marinensis	Point Reyes horkelia	List 1B.2	Coastal dunes, Coastal prairie, Coastal scrub/sandy	May-Sep	N
Horkelia tenuiloba	thin-lobed horkelia	List 1B.2	Broadleafed upland forest, Chaparral, Valley and foothill grassland/mesic openings, sandy	May-Jul	N
Lasthenia conjugens	Contra Costa goldfields	List 1B.1	Cismontane woodland, Playas(alkaline), Valley and foothill grassland, Vernal pools/mesic	Mar-Jun	N
Lasthenia macrantha ssp. bakeri	Baker's goldfields	List 1B.2	Closed-cone coniferous forest(openings), Coastal scrub, Meadows and seeps, Marshes and swamps	Apr-Oct	P
Lasthenia macrantha ssp. macrantha	perennial goldfields	List 1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub	Jan-Nov	N
Lathyrus palustris	marsh pea	List 2.2	Bogs and fens, Coastal prairie, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, North Coast coniferous forest/mesic	Mar-Aug	P
Leptosiphon jepsonii	Jepson's leptosiphon	List 1B.2	Chaparral, Cismontane woodland/usually volcanic	Apr-May	N
Leptosiphon rosaceus	rose leptosiphon	List 1B.1	Coastal bluff scrub	Apr-Jul	N
Lessingia arachnoidea	Crystal Springs lessingia	List 1B.2	Cismontane woodland, Coastal scrub, Valley and foothill grassland/serpentinite, often roadsides	Jul-Oct	N

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

Scientific Name	Common Name	CNPS_ LIST	Natural communities	Blooming periods	Habitat in the THP
Lilium maritimum	coast lily	List 1B.1	Broadleafed upland forest, Closed-cone coniferous forest, Coastal prairie, Coastal scrub, Marshes and swamps(freshwater), North Coast coniferous forest/sometimes roadside	May-Aug	P
Limnanthes vinculans	Sebastopol meadowfoam	List 1B.1	Meadows and seeps, Valley and foothill grassland, Vernal pools/vernally mesic	Apr-May	N
Lupinus sericatus	Cobb Mountain lupine	List 1B.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest	Mar-Jun	N
Lupinus tidestromii	Tidestrom's lupine	List 1B.1	Coastal dunes	Apr-Jun	N
Lycopodium clavatum	running-pine	List 2.3	Lower montane coniferous forest(mesic), Marshes and swamps, North Coast coniferous forest(mesic)/often edges, openings, and roadsides	Jun-Aug	P
Microseris paludosa	marsh microseris	List 1B.2	Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland	Apr-Jun(Jul)	N
Monardella villosa ssp. globosa	robust monardella	List 1B.2	Broadleafed upland forest(openings), Chaparral(openings), Cismontane woodland, Coastal scrub, Valley and foothill grassland	Jun-Jul	N
Pinus contorta ssp. bolanderi	Bolander's beach pine	List 1B.2	Closed-cone coniferous forest(podzol-like soil)		N
Piperia Candida	White-flowered rein orchid	List 1B.2	• Broadleafed upland forest • Lower montane coniferous forest • North Coast coniferous forest	Mar-Sept	P
Pleuropogon hooverianus	North Coast semaphore grass	List 1B.1	Broadleafed upland forest, Meadows and seeps, North Coast coniferous forest/open areas, mesic	Apr-Aug	P
Potamogeton epihydrus	Nuttall's ribbon-leaved pondweed	2.2	Marshes and swamps (assorted shallow freshwater)	June-Sept	P
Rhynchospora alba	white beaked-rush	List 2.2	Bogs and fens, Meadows and seeps, Marshes and swamps(freshwater)	Jul-Aug	P
Sanguisorba officinalis	great burnet	List 2.2	Bogs and fens, Broadleafed upland forest, Meadows and seeps, Marshes and swamps, North Coast coniferous forest, Riparian forest/often serpentinite	Jul-Oct	P
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	List 1B.2	Marshes and swamps(freshwater, near coast)	Apr-Sep	P
Sidalcea hickmanii ssp. viridis	Marin checkerbloom	List 1B.3	Chaparral(serpentinite)	May-Jun	N

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Scientific Name	Common Name	CNPS_LIST	Natural communities	Blooming periods	Habitat in the THP
Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	List 1B.2	Coastal bluff scrub, Coastal prairie, North Coast coniferous forest/often roadcuts	May-Aug	N
Sidalcea malviflora ssp. purpurea	purple-stemmed checkerbloom	List 1B.2	Broadleafed upland forest, Coastal prairie	May-Jun	N
Streptanthus glandulosus var. hoffmanii	secund jewel-flower	List 1B.3	Chaparral, Cismontane woodland, Valley and foothill grassland(often serpentinite)/rocky	Mar-Jul	N
Streptanthus morrisonii ssp. elatus	Three Peaks jewel-flower	List 1B.2	Chaparral(serpentinite)	Jun-Sep	N
Streptanthus morrisonii ssp. hirtiflorus	Dorr's Cabin jewel-flower	List 1B.2	Closed-cone coniferous forest, Chaparral/serpentinite	Jun	N
Streptanthus morrisonii ssp. morrisonii	Morrison's jewel-flower	List 1B.2	Chaparral(serpentinite, rocky, talus)	May-Sep	N
Tracyina rostrata	beaked tracyina	List 1B.2	Cismontane woodland, Valley and foothill grassland	May-Jun	N
Trifolium amoenum	showy Indian clover	List 1B.1	Coastal bluff scrub, Valley and foothill grassland(sometimes serpentinite)	Apr-Jun	N
Trifolium buckwestiorum	Santa Cruz clover	List 1B.1	Broadleafed upland forest, Cismontane woodland, Coastal prairie/margins	Apr-Oct	N
Trifolium depauperatum var. hydrophilum	saline clover	List 1B.2	Marshes and swamps, Valley and foothill grassland(mesic, alkaline), Vernal pools	Apr-Jun	N
Triphysaria floribunda	San Francisco owl's-clover	List 1B.2	Coastal prairie, Coastal scrub, Valley and foothill grassland/usually serpentinite	Apr-Jun	N
Triquetrella californica	coastal triquetrella	List 1B.2	Coastal bluff scrub, Coastal scrub/soil		N

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

Table 2 List of special status natural communities

CTT41100CA	***Coastal Terrace Prairie***	None	None	G2	S2.1
CTT52110CA	***Northern Coastal Salt Marsh***	None	None	G3	S3.2
CTT52200CA	***Coastal Brackish Marsh***	None	None	G2	S2.1
CTT52410CA	***Coastal and Valley Freshwater Marsh***	None	None	G3	S2.1
CTT83161CA	***Mendocino Pygmy Cypress Forest***	None	None	G2	S2.1

Table 3 Potential plants with habitat in THP area

Scientific Name	Common Name	Bloom	potential presence
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	May-Jul	moderate
Astragalus agnicidus	Humboldt milk-vetch	Apr-Aug	moderate
Boschniakia hookeri	small groundcone	Apr-Aug	moderate
Campanula californica	swamp harebell	Jun-Oct	high
Carex albida	white sedge	May-Jul	moderate
Carex californica	California sedge	May-Aug	low
Carex comosa	bristly sedge	May-Sep	moderate
Carex lyngbyei	Lyngbye's sedge	May-Aug	moderate
Carex saliniformis	deceiving sedge	Jun	moderate
Coptis laciniata	Oregon goldthread	Mar-Apr	low
Dirca occidentalis	western leatherwood	Jan-Mar(Apr)	moderate
Erythronium revolutum	coast fawn lily	Mar-Jul(Aug)	moderate
Fissidens pauperculus	minute pocket moss		low
Glyceria grandis	American manna grass	Jun-Aug	moderate
Lasthenia macrantha ssp. bakeri	Baker's goldfields	Mar-Aug	moderate
Lathyrus palustris	marsh pea	Mar-Aug	moderate
Lilium maritimum	coast lily	May-Aug	low
Lycopodium clavatum	running-pine	Jun-Aug	low
Piperia Candida	White-flowered rein orchid	Mar-Sept	moderate
Pleuropogon hooverianus	North Coast semaphore grass	Apr-Aug	high
Potamogeton epihydrus	Nuttall's ribbon-leaved pondweed	June-Sept	moderate
Ramalina thrausta	angel's hair lichen		low
Rhynchospora alba	white beaked-rush	Jul-Aug	moderate
Sanguisorba officinalis	great burnet	Jul-Oct	moderate
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	Apr-Sep	moderate

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

• **A description of the area surveyed relative to the project area;**
Survey area relative to the project will be shown on rare plant survey map below.

• **References cited, persons contacted, and herbaria visited;**
Botanist Clare Golec's 1997 Rare Plant Assessment for Gualala Redwoods Inc.
CNPS database
California Department of Fish and Wildlife's CNDDB
Gualala Redwood Timber LLC's GIS database.
John Bennett RPF for GRT.

PART OF PLAN

• **Description of reference site(s), if visited, and phenological development of special status plant(s);**
The German Rancho area of GRT's property is especially rich with rare plants so in May and June this area was visited to determine the flowering status of rare plants that are known to occur there. This helped the RPF determine the best time to conduct the survey for the plants most likely to occur elsewhere.

• **A list of all taxa occurring on the project site. Identify plants to the taxonomic level necessary to determine whether or not they are a special status species;**
Table of common plants will be filled out after survey is completed.

• **Any use of existing surveys and a discussion of applicability to this project;**
See discussion of botanist Clare Golec's work above.

• **A discussion of the potential for a false negative survey;**
Although a false negative survey is always possible it is unlikely since these units have been extensively covered numerous times over the years by both botanists and foresters. John Bennett RPF, has spent a great deal of time in the area of this harvest plan and is very familiar with many of the rare plants that are found on the property.

• **Provide detailed data and maps for all special plants detected. Information specified above under the headings "Special Status Plant or Natural Community Observations," and "Field Survey Forms," should be provided for locations of each special status plant detected;**
Not applicable; none found.

• **Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms should be sent to the CNDDB and included in the environmental document as an Appendix. It is not necessary to submit entire environmental documents to the CNDDB.**
Acknowledged.

• **The location of voucher specimens, if collected.**
Not applicable.

Assessment of potential impacts-

• **A discussion of the significance of special status plant populations in the project area considering**

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

nearby populations and total species distribution;
This will be filled out after survey is completed.

• A discussion of the significance of special status natural communities in the project area considering nearby occurrences and natural community distribution;

The following special status natural communities that showed up in the scoping process are not known to exist in the THP area: Coastal Terrace Prairie, Northern Coastal Salt Marsh, Coastal Brackish Marsh, Coastal and Valley Freshwater Marsh, Mendocino Pygmy Cypress Forest.

• A discussion of direct, indirect, and cumulative impacts to the plants and natural communities;

Not applicable until after survey.

• A discussion of threats, including those from invasive species, to the plants and natural communities;

The greatest threat to known populations of rare plants within the property appears to be dense canopy cover, either overstory from conifers or understory from huckleberry, manzanita, tall blue blossom or pampas grass. Over the years foresters for GRI and now GRT have witnessed the decline of populations of swamp harebell as overstory canopy becomes denser. Conversely, they have seen populations expand quite dramatically in areas where canopy has been reduced or removed entirely. Coast lily also appears to prefer openings especially along the edges of roads and skid trails although it seems to be able to tolerate some fairly dense understory competition. In recent years almost all herbicide use has been through direct application to the trunks of tanoak and broadcast spraying has been terminated. Broadcast burning is no longer done on the property and even pile burning has declined dramatically although it should be noted that the largest concentration of rare plants on the property is in a clearcut that was burned postharvest. The dense overstory canopy in the THP area may limit the establishment of certain species but there are no known populations of rare plants currently present in the THP area.

• A discussion of the degree of impact, if any, of the proposed project on unoccupied, potential habitat of the species;

The proposed project has the slight potential of allowing rare plants to become established in openings created by tree removal.

• A discussion of the immediacy of potential impacts and recommended measures to avoid, minimize, or mitigate impacts.

Not applicable until after survey.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Common Plant species list (to be used and modified during survey)

THP name-Little	check box if present
Date and time spent-	
Common name	
alder (red)	
alumroot (small-flowered)	
anise	
Australian fireweed	
Azalea	
baby stars	
Baker's goldfields	
Baker's larkspur	
Bay-Laurel	
beaked tracyina	
bedstraw	
bicolor lotus	
bird's-foot lotus	
Bishop pine	
black oak	
blue blossom	
blue dicks	
blue-eyed grass	
blue flax	
Bolander rush	
Bolander's phacelia	
buck brush	
buckeye	
bulrush (small-flowered)	
buttercup	
calypso orchid	
carrot (wild)	
catchfly	
Cat's ears	
ceanothus (sp.)	
checkerbloom (maple leaved)	
checkerbloom (Point Reyes)	
checkerbloom (purple-stemmed)	
checkerbloom (Siskiyou)	
chickweed	
chinquapin (dwarf)	
chinquapin (giant)	
cinquefoil	
Clintonia (andrews) bead lily	
clover (Santa Cruz)	
clover (showy Indian)	
clover (Spanish)	
clover (spotted)	
clover (white)	
coast boykinia	
fawn lily (coast)	
coast lily	
coastal bluff morning-glory	
coltsfoot	
coralroot	
corn lily	
cow parsnip	

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

coyote brush	
creeping cudweed	
cut-leaved geranium	
dandelion	
Death camas	
deer brush	
Douglas-fir	
doveweed	
duckweed	
elderberry	
elk clover	
english daisy	
eucalyptus	
English plantain	
fairy bells	
fern (bracken)	
fern (chain)	
fern (deer)	
fern (five-fingered)	
fern (goldenback)	
fern (lady)	
Fern (maiden hair)	
fern (sword)	
fescue	
Fetid adders tongue	
fiddleneck	
field bindweed	
figwort (coast)	
forget me not	
foxglove	
fragrant fritillary	
French broom	
fringecups	
fringed false hellebore	
ginger	
gooseberry	
Grand fir	
grape-fern	
grass (American manna)	
Grass (annual blue)	
Grass (barley)	
grass (bear)	
grass (bolanders reed)	
Grass (cheat)	
grass (creeping bent)	
grass (goose)	
grass (Kentucky blue)	
grass (North Coast semaphore)	
Grass (oat)	
grass (Orchard)	
grass (perennial rye)	
grass (rattlesnake) (large)	
grass (rattlesnake) (small)	
grass (ripgut)	
grass (sweet vernal)	
grass (vanilla)	
grass (velvet)	
great burnet	
groundcone (California)	
groundcone (small)	

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

hairy honeysuckle	
hazelnut	
hedgehog dogtail	
hedge-nettle	
hemlock	
hill lotus	
Himalayan blackberry	
horsetail	
hound's-tongue	
huckleberry (california blue)	
huckleberry (red)	
Humboldt milk-vetch	
hyacinth (white)	
Indian pink	
inside-out flower (redwood)	
iris (Douglas)	
Ithuriel's spear	
Labrador tea	
lace flower	
large-flowered agoseris	
leopard lily	
little princes pine	
live oak (canyon)	
live oak (coast)	
lupine (false)	
lupine (miniature)	
madrone	
mallow	
manzanita (glossyleaf)	
manzanita (hairy)	
manzanita (hoary)	
manzanita (Rincon)	
maple (bigleaf)	
marsh pea	
milkwort	
miners lettuce	
mountain sweet-cicely	
mugwort	
Napa false indigo	
narrow-anthered California brodiaea	
nemophila (small-flowered)	
nutmeg	
oats (wild)	
orange monkey flower	
Oregon ash	
Oregon goldthread	
oregon grape	
Pacific bramble	
Pampas grass	
pea (hillside)	
plantain (rattlesnake)	
poison hemlock	
poison-oak	
popcorn flower	
poppy	
purple cudweed	
purple needlegrass	
purple-leaved fireweed	
radish (wild)	

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

raspberry (white-stemmed)	
rattlesnake weed	
Redwood ivy	
redwood	
redwood sorrel	
rhododendron	
robust monardella	
rock-rose (dwarf)	
running-pine	
Rush (white beaked)	
rush (common)	
rush (scouring)	
rush (spreading)	
rush (toad)	
salal	
salmonberry	
scarlet pimpernel	
sedge (bristly)	
sedge (broom)	
sedge (California)	
sedge (deceiving)	
Sedge (false nutsedge)	
sedge (Lyngbye's)	
sedge (slough)	
sedge (tall flat)	
Sedge(white)	
sedges (Carex spp.)	
self-heal	
shasta daisy	
sheep sorrel	
shrub oak	
Siberian candyflower	
silk-tassle	
silver European hairgrass	
slink pod (fetid adders tongue)	
Smith's fairy bells	
snakeroot (Pacific)	
snowbrush	
soap plant	
soft chess	
solomon's seal	
Sonoma alopecurus	
spicebush	
star flower (Pacific)	
star lily	
stickseed	
stinging nettle	
stork's-bill	
strawberry (wood)	
sugar pine	
sun cup	
swamp harebell	
tanbark oak	
tarweed (slender)	
thimbleberry	
thin-lobed horkelia	
thistle (bull)	
thistle (Italian)	
tomcat clover	
toothed coast fireweed	

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

toothwort	
trail plant	
trifid bedstraw	
trillium	
Usnea longisima	
vanilla leaf	
vetch (spring)	
violet (redwood)	
water-parsley	
wax myrtle	
weedy cudweed	
western leatherwood	
wild licorice	
willow	
wood rose	
woodland madia	
woolly mullien	
woolly sunflower	
yarrow	
yellow parentucellia	
Yerba buena	
yerba de selva	
Yerba santa	
yew	

Summary of Biological Assessment-The operations proposed under this THP do not have a reasonable potential to join with the impacts of other projects to cause significant cumulative biological impacts.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Rare Plant Assessment and Botanical Survey Report

Little THP

Gualala
Mendocino County, California

Prepared by:

Christina Wagner
Professional Botanist
750 6th Street
Arcata, CA 95521

September, 2019

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/21

218.1

Sec. IV

INTRODUCTION

Rare plant assessments and comprehensive, floristic field surveys are conducted to determine the presence of rare, threatened, or endangered plants and plant communities or the potential for the presence of sensitive species or critical habitat that may occur within the proposed project area or be potentially impacted by the proposed project. Survey findings are used to assess the potential for significant adverse impacts on botanical resources and are critical in mitigating those impacts.

This report documents findings from two seasonal, floristic surveys and addresses the impact that timber harvesting will have on rare or endangered plants within the boundary of the Little Timber Harvest Plan (THP). Timber operations such as harvesting, road and landing construction, watercourse crossings, and site preparation have the potential to impact sensitive plants. This botanical field study was undertaken to determine if rare or endangered plant species exist in or near the projected impact areas and, if so, to recommend mitigation to minimize or avoid damage to the species. In order to conduct an effective survey, potentially occurring rare plant species were researched and surveyed for based on their blooming times and habitat requirements. The following report is based on *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018).

PROJECT AND LOCATION DESCRIPTION

The Little THP is located in Mendocino County northeast of the town of Gualala and within the Gualala River watershed. The site is located in Sections 4, 9, 10, 14, 15, and 23 T11NR15W, MDBM in the Gualala 7.5 minute quadrangle. Elevations within the plan range from approximately 40 feet to 500 feet above sea level. Site aspect is mostly flat or east and west facing. The terrain is moderate with slopes ranging from level ground to 55%. Soils for the THP area are mostly Big River Loamy Sand but there are areas of Irmulco Tramway complex, DeHaven Hotel complex and Cottaneva Loam complex.

PART OF PLAN

HABITAT TYPES

The vegetation communities present within the timber harvest plan boundaries were noted whenever the vegetation conformed to the standard classification guidelines found in A Manual of California Vegetation, 2nd Edition (MCV) Sawyer, Keeler-Wolf, & Evens 2009). The dominant habitats identified include *Sequoia sempervirens* alliance, *Alnus rubra* alliance, *Lithocarpus densiflorus* alliance, *Rhododendron occidentale* provisional alliance, *Rubus* (*parviflorus, spectabilis, ursinus*) Shrubland Alliance, and *Carex obnupta* Herbaceous alliance.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
BUREAU OF LAND MANAGEMENT

SURVEY METHODOLOGY

The purpose of this document is to identify rare, threatened, and endangered vascular and

nonvascular plants and sensitive natural communities in relation to timber management activities for the Little THP. These considerations include the determination of pertinent rare plants, occurrence of and potential habitat for rare plants, and potential management impacts.

The plants assessed for this document as rare, threatened, or endangered are the native vascular and non-vascular plant species currently protected on both the federal and state levels and with known occurrences using a 9 Quadrangle search. The development of the list for potentially occurring rare, threatened, and endangered species was based on known occurrences on the Gualala USGS 7.5' minute quadrangle and the adjacent Point Arena, Eureka Hill, Zeni Ridge, Saunders Reef, McGuire Ridge, Stewarts Point OE W, and Stewarts Point quadrangles. The regional assessment utilized the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California electronic inventory (online edition, v8-03 0.39) and the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) RareFind (v5.2.14), and BIOS and QuickView Tool (v5.77.14).

These plants have been derived from the following lists:

- Federal listed or proposed threatened or endangered plants or species of concern (FT, FE, FSC)
- California State listed or proposed rare, threatened or endangered plants or species of concern (SR, ST, SE, SP, CSC)
- California Native Plant Society's Rare Plant Rank (CRPR) list 1A species (plants presumed extirpated in California, and either rare or extinct elsewhere)
- California Native Plant Society's Rare Plant Rank (CRPR) list 1B species (plants rare, threatened or endangered in California and elsewhere)
- California Native Plant Society's Rare Plant Rank (CRPR) list 2A species (plants presumed extirpated in California but more common elsewhere)
- California Native Plant Society's Rare Plant Rank (CRPR) list 2B species (plants rare, threatened, or endangered in California but more common elsewhere)
- California Native Plant Society's Rare Plant Rank (CRPR) list 3 (plants which more information is needed- a review list)
- California Native Plant Society's Rare Plant Rank (CRPR) list 4 (plants of limited distribution- a watch list)

According to the CNPS and CNDDB, there are fifty-two listed plant species and five sensitive communities that have the potential to exist within the project area and are listed below in Tables 1 and 2. The plant list was compiled to help focus on the rare plants that have the highest probability of occurring in the project area. Additional consideration for any other known species for the region was taken.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Table 1. Sensitive Plant Communities with Potential to Exist within the Little THP

Sensitive Community	GRank	SRank	Habitats
Coastal and Valley Freshwater Marsh	G3	S2.1	Marsh & swamp, Wetland
Coastal Brackish Marsh	G2	S2.1	Marsh & swamp, Wetland
Coastal Terrace Prairie	G2	S2.1	Coastal prairie
Northern Coastal Bluff Scrub	G2	S2.2	Coastal prairie & Shrubland
Northern Coastal Salt Marsh	G3	S3.2	Marsh & swamp, Wetland

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/21

221

Sec. IV

1/10/21

Table 2. Rare, Threatened, and Endangered Vascular and Nonvascular Plants with Potential to Exist within the Little THP

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Bryoria pseudocapillaris	false gray horsehair lichen	Parmeliaceae	3.2	None	None	Coastal dunes (SLO Co.), North Coast coniferous forest (immediate coast)	
Bryoria spiralifera	twisted horsehair lichen	Parmeliaceae	1B.1	None	None	North Coast coniferous forest (immediate coast)	
Hypogymnia schizidiata	island rock lichen	Parmeliaceae	1B.3	None	None	Closed-cone coniferous forest, Chaparral	
Usnea longissima	Methuselah's beard lichen	Parmeliaceae	4.2	None	None	Broadleafed upland forest, North Coast coniferous forest	
Abronia umbellata var. breviflora	pink sand-verbena	Nyctaginaceae	1B.1	None	None	Coastal dunes	Jun-Oct
Agrostis blasdalei	Blasdale's bent grass	Poaceae	1B.2	None	None	Coastal bluff scrub, Coastal dunes, Coastal prairie	May-Jul
Astragalus agnicidus	Humboldt County milk-vetch	Fabaceae	1B.1	CE	None	Broadleafed upland forest, North Coast coniferous forest	Apr-Sep
Astragalus rattanii var. rattanii	Rattan's milk-vetch	Fabaceae	4.3	None	None	Chaparral, Cismontane woodland, Lower montane coniferous forest	Apr-Jul

22.1

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

Sec. IV

1/10/21

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Calamagrostis bolanderi	Bolander's reed grass	Poaceae	4.2	None	None	Broadleafed upland forest, Closed-cone coniferous forest, Coastal scrub, Meadows and seeps, Marshes and swamps, North Coast coniferous forest	May-Aug
Calystegia purpurata ssp. saxicola	coastal bluff morning-glory	Convulvulaceae	1B.2	None	None	Coastal bluff scrub, Coastal dunes, Coastal scrub, North Coast coniferous forest	(Mar)Apr-Sep
Campanula californica	swamp harebell	Campanulaceae	1B.2	None	None	Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps (freshwater), North Coast coniferous forest	Jun-Oct
Carex californica	California sedge	Cyperaceae	2B.3	None	None	Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps (margins)	May-Aug

221.2

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

Sec. IV

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Carex lyngbyei	Lyngbye's sedge	Cyperaceae	2B.2	None	None	Marshes and swamps (brackish or freshwater)	Apr-Aug
Carex saliniformis	deceiving sedge	Cyperaceae	1B.2	None	None	Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps (coastal salt)	Jun(Jul)
Castilleja ambigua var. ambigua	johnny-nip	Orobanchaceae	4.2	None	None	Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools margins	Mar-Aug
Castilleja ambigua var. humboldtiensis	Humboldt Bay owl's-clover	Orobanchaceae	1B.2	None	None	Marshes and swamps (coastal salt)	Apr-Aug
Castilleja mendocinensis	Mendocino Coast paintbrush	Orobanchaceae	1B.2	None	None	Coastal bluff scrub, Closed-cone coniferous forest, Coastal dunes, Coastal prairie, Coastal scrub	Apr-Aug
Ceanothus gloriosus var. exaltatus	glory brush	Rhamnaceae	4.3	None	None	Chaparral	Mar-Jun(Aug)

1/10/21
221.3
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
PART OF PLAN
Sec. IV

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Ceanothus gloriosus var. gloriosus	Point Reyes ceanothus	Rhamnaceae	4.3	None	None	Coastal bluff scrub, Closed-cone coniferous forest, Coastal dunes, Coastal scrub	Mar-May
Coptis laciniata	Oregon goldthread	Ranunculaceae	4.2	None	None	Meadows and seeps, North Coast coniferous forest (streambanks)	(Feb)Mar-May(Sep-Nov)
Cuscuta pacifica var. papillata	Mendocino dodder	Convulvulaceae	1B.2	None	None	Coastal dunes (interdune depressions)	(Jun)Jul-Oct
Erigeron biolettii	streamside daisy	Asteraceae	3	None	None	Broadleafed upland forest, Cismontane woodland, North Coast coniferous forest	Jun-Oct
Erigeron supplex	supple daisy	Asteraceae	1B.2	None	None	Coastal bluff scrub, Coastal prairie	May-Jul
Erysimum concinnum	bluff wallflower	Brassicaceae	1B.2	None	None	Coastal bluff scrub, Coastal dunes, Coastal prairie	Feb-Jul
Fritillaria roderickii	Roderick's fritillary	Liliaceae	1B.1	CE	None	Coastal bluff scrub, Coastal prairie, Valley and foothill grassland	Mar-May

1/10/21
221.4
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
PART OF PLAN
Sec. IV

1/10/21

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Gilia capitata ssp. pacifica	Pacific gilia	Polemoniaceae	1B.2	None	None	Coastal bluff scrub, Chaparral (openings), Coastal prairie, Valley and foothill grassland	Apr-Aug
Gilia capitata ssp. tomentosa	woolly-headed gilia	Polemoniaceae	1B.1	None	None	Coastal bluff scrub, Valley and foothill grassland	May-Jul
Glehnia littoralis ssp. leiocarpa	American glehnia	Apiaceae	4.2	None	None	Coastal dunes	May-Aug
Glyceria grandis	American manna grass	Poaceae	2B.3	None	None	Bogs and fens, Meadows and seeps, Marshes and swamps (streambanks and lake margins)	Jun-Aug
Hesperevax sparsiflora var. brevifolia	short-leaved evax	Asteraceae	1B.2	None	None	Coastal bluff scrub (sandy), Coastal dunes, Coastal prairie	Mar-Jun
Hesperocyparis pygmaea	pygmy cypress	Cupressaceae	1B.2	None	None	Closed-cone coniferous forest (usually podzol-like soil)	
Horkelia marinensis	Point Reyes horkelia	Rosaceae	1B.2	None	None	Coastal dunes, Coastal prairie, Coastal scrub	May-Sep
Horkelia tenuiloba	thin-lobed horkelia	Rosaceae	1B.2	None	None	Broadleafed upland forest, Chaparral, Valley and foothill grassland	May-Jul(Aug)

221.5

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

Sec. IV

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Hosackia gracilis	harlequin lotus	Fabaceae	4.2	None	None	Broadleafed upland forest, Coastal bluff scrub, Closed-cone coniferous forest, Cismontane woodland, Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps, North Coast coniferous forest, Valley and foothill grassland	Mar-Jul
Kopsiopsis hookeri	small groundcone	Orobanchaceae	2B.3	None	None	North Coast coniferous forest	Apr-Aug
Lasthenia californica ssp. bakeri	Baker's goldfields	Asteraceae	1B.2	None	None	Closed-cone coniferous forest (openings), Coastal scrub, Meadows and seeps, Marshes and swamps	Apr-Oct
Lasthenia californica ssp. macrantha	perennial goldfields	Asteraceae	1B.2	None	None	Coastal bluff scrub, Coastal dunes, Coastal scrub	Jan-Nov
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	1B.1	None	FE	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, Vernal pools	Mar-Jun

1/10/21

221.6

RECEIVED
MAR 16 2021
COAST AREA OFFICE

PART OF PLAN

Sec. IV

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Lathyrus palustris	marsh pea	Fabaceae	2B.2	None	None	Bogs and fens, Coastal prairie, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, North Coast coniferous forest	Mar-Aug
Lilium maritimum	coast lily	Liliaceae	1B.1	None	None	Broadleafed upland forest, Closed-cone coniferous forest, Coastal prairie, Coastal scrub, Marshes and swamps (freshwater), North Coast coniferous forest	May-Aug
Lycopodium clavatum	running-pine	Lycopodiaceae	4.1	None	None	Lower montane coniferous forest (mesic), Marshes and swamps, North Coast coniferous forest (mesic)	Jun-Aug(Sep)
Microseris paludosa	marsh microseris	Asteraceae	1B.2	None	None	Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland	Apr-Jun(Jul)

1/10/21
221.7
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
PART OF PLAN
Sec. IV

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Oenothera wolfii	Wolf's evening-primrose	Onagraceae	1B.1	None	None	Coastal bluff scrub, Coastal dunes, Coastal prairie, Lower montane coniferous forest	May-Oct
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	Apiaceae	4.2	None	None	Broadleafed upland forest, Chaparral, Coastal prairie, Valley and foothill grassland, Vernal pools	Jun-Oct
Piperia candida	white-flowered rein orchid	Orchidaceae	1B.2	None	None	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest	(Mar)May-Sep
Potamogeton epihydrus	Nuttall's ribbon-leaved pondweed	Potamogetonaceae	2B.2	None	None	Marshes and swamps (assorted shallow freshwater)	(Jun)Jul-Sep
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	Malvaceae	1B.2	None	None	Marshes and swamps (freshwater, near coast)	Apr-Sep
Sidalcea malachroides	maple-leaved checkerbloom	Malvaceae	4.2	None	None	Broadleafed upland forest, Coastal prairie, Coastal scrub, North Coast coniferous forest, Riparian woodland	(Mar)Apr-Aug
Sidalcea malviflora ssp. purpurea	purple-stemmed checkerbloom	Malvaceae	1B.2	None	None	Broadleafed upland forest, Coastal prairie	May-Jun

1/10/21
221.8
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
Sec. IV
PART OF PLAN

Scientific Name	Common Name	Family	CRPR	CESA	FESA	Habitat	Blooming Period
Trifolium buckwestiorum	Santa Cruz clover	Fabaceae	1B.1	None	None	Broadleafed upland forest, Cismontane woodland, Coastal prairie	Apr-Oct
Trifolium trichocalyx	Monterey clover	Fabaceae	1B.1	CE	FE	Closed-cone coniferous forest (sandy, openings, burned areas)	Apr-Jun
Veratrum fimbriatum	fringed false-hellebore	Melanthiaceae	4.3	None	None	Bogs and fens, Coastal scrub, Meadows and seeps, North Coast coniferous forest	Jul-Sep

1/10/21
221.9
PART OF PLAN
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
Sec. IV

FIELD SURVEY RESULTS

A botanical survey for the Little THP was conducted on April 12-14, 2019, and June 14-15, 2019. The survey was conducted by Christy Wagner, consulting botanist. The survey protocol was based on *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). A seasonally appropriate, floristic survey was performed throughout the property with a focus on roads, landings, skid trails, riparian areas, and forested areas proposed for timber harvest to maximize the likelihood of finding rare threated, and endangered plants or sensitive plant communities that may be present. The plants encountered in the field were identified to the lowest taxonomic level (genus or species) necessary for a rare plant determination and recorded on a species list (Appendix A). The survey resulted in 168 native and non-native species identified within the THP boundaries.

Of the 168 species recorded, 2 species of concern were identified.

A small population of *Pityopus californica* (pinefoot; CNPS 4.2) of 3 flowering plants was found near the northwest THP boundary of the large southern section growing under redwood and tanoak on the open forest floor. The population has been flagged with a 50 foot EEZ (equipment exclusion zone) to be avoided. A California Native Species Field Form has been prepared to be submitted to CNDDB.

Veratrum fimbriatum (fringed corn lily; CNPS 4.3) grows abundantly in large patches throughout the floodplain within the timber harvest boundary. Fringed corn lily has a deep root system able to follow a receding water table and thick rhizomes. This root structure enables the plant to tolerate soil disturbance and is a contributing factor to how fringed corn lily thrives in floodplains that receive annual winter scour and deposition. The activities described for the floodplain areas within the Little THP will have minimal impact on the corn lily. Therefore, no treatment is prescribed.

A population of *Asyneuma prenanthoides* (California harebell) was confirmed within a flat shaded area that appears to be an old staging area. This population was previously suspected to be *Campanula californica* (swamp harebell; CNPS 1B.2). All 38 plants were flowering and exhibited key characteristics of California harebell including the corolla lobes cut at least three quarters to the base and more than one flower per node.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/21 221.10 Sec. IV

PART OF PLAN

REFERENCES

California Department of Fish and Wildlife. *California Natural Diversity Database (CNDDB) Quick Viewer* (online edition, v5.66.18). Sacramento, CA. Accessed on March 19, 2018 from https://map.dfg.ca.gov/bios/?tool=cnddbQuick.

California Department of Fish and Wildlife. March 20, 2018. *Protocols for Surveying And Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.* https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959

California Native Plant Society, Rare Plant Program. 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.45). Website http://www.rareplants.cnps.org [accessed 16 March 2018].

Calflora: Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. [web application]. 2018. Berkeley, California: The Calflora Database [a non-profit organization]. Available: http://www.calflora.org/

CalPhoto Database at https://calphotos.berkeley.edu/flora/, for photos, descriptions, and habitat ranges of rare, threatened or endangered plants found on CNPS and CNDDB queries.

Jepson Flora Project (eds.) 2018. Jepson eFlora, http://ucjeps.berkeley.edu/eflora/

Flora of North America Editorial Committee, eds. 1993+. *Flora of North America North of Mexico*. 20+ vols. New York and Oxford.

B.G. Baldwin, D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken [editors]. 2012. *The Jepson Manual: Vascular Plants of California*. 2nd edition. University of California Press, Berkeley, CA.

Hickman, J. C. (ed). 1993. *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley, CA.

Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Nongame- Heritage Program, California Department of Fish and Game. Sacramento, CA. 156 pp.

McCune, B. and L. Geiser. 1997. *Macrolichens of the Pacific Northwest*. Oregon State University Press.

Sawyer, J. O. and T. Keeler-Wolfe. 2008. *A Manual of California Vegetation.* California Native Plant Society. Sacramento, CA.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/21
221.11
Sec IV

1/10/21

Appendix A. List of Observed Flora

Little Botanical Survey and Rare Plant Assessment
Species Inventory
Surveys Performed by: Christy Wagner
Dates: April 12, 14; June 14, 15

PART OF PLAN

Scientific Name				COMMON NAME	FAMILY	NATIVE	FORM
Adiantum	*aleuticum*			five finger fern	Pteridaceae	Y	Ferns and Allies
Athyrium	*filix-femina*	var.	*cyclosorum*	lady fern	Woodsiaceae	Y	Ferns and Allies
Blechnum	*spicant*			deer fern	Blechnaceae	Y	Ferns and Allies
Equisetum	*hyemale*			scouring rush	Equisetaceae	Y	Ferns and Allies
Equisetum	*telmateia*			giant horsetail	Equisetaceae	Y	Ferns and Allies
Pentagramma	*triangularis*			gold back fern	Pteridaceae	Y	Ferns and Allies
Polypodium	*glycyrrhiza*			licorice fern	Polypodiaceae	Y	Ferns and Allies
Polystichum	*munitum*			western sword fern	Dryopteridaceae	Y	Ferns and Allies
Pteridium	*aquilinum*	var.	*pubescens*	western bracken fern	Dennstaedtiaceae	Y	Ferns and Allies
Woodwardia	*fimbriata*			western chain fern	Blechnaceae	Y	Ferns and Allies
Anthoxanthum	*occidentale*			vanilla grass	Poaceae	Y	Graminoid
Anthoxanthum	*odoratum*			sweet vernal grass	Poaceae	N	Graminoid

221.12

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Sec. IV

Scientific Name				COMMON NAME	FAMILY	NATIVE	FORM
Briza	*maxima*			rattlesnake grass	Poaceae	N	Graminoid
Briza	*minor*			little rattlesnake grass	Poaceae	N	Graminoid
Bromus	*carinatus*			California brome	Poaceae	Y	Graminoid
Bromus	*diandrus*			ripgut brome	Poaceae	N	Graminoid
Bromus	*vulgaris*			common brome	Poaceae	Y	Graminoid
Carex	*brevicaulis*			short stem sedge	Cyperaceae	Y	Graminoid
Carex	*mendocinensis*			Mendocino sedge	Cyperaceae	Y	Graminoid
Carex	*obnupta*			slough sedge	Cyperaceae	Y	Graminoid
Carex	*tumulicola*			split awn sedge	Cyperaceae	Y	Graminoid
Carex	*bolanderi*			Bolander's sedge	Cyperaceae	Y	Graminoid
Cortaderia	*jubata*			Andean pampas grass	Poaceae	N	Graminoid
Cynosurus	*echinatus*			hedgehog dog tail	Poaceae	N	Graminoid
Cyperus	*eragrostis*			tall nutsedge	Cyperaceae	Y	Graminoid
Dactylis	*glomerata*			orchard grass	Poaceae	N	Graminoid
Danthonia	*californica*			California oatgrass	Poaceae	Y	Graminoid
Deschampsia	*cespitosa*			tufted hair grass	Poaceae	Y	Graminoid
Deschampsia	*elongata*			slender hair grass	Poaceae	Y	Graminoid
Elymus	*glaucus*			blue wild rye	Poaceae	Y	Graminoid
Festuca	*rubra*			red fescue	Poaceae	Y	Graminoid
Holus	*lanatus*			velvet grass	Poaceae	N	Graminoid
Juncus	*effusus*			common rush	Juncaceae	Y	Graminoid
Juncus	*occidentalis*			slender rush	Juncaceae	Y	Graminoid
Juncus	*patens*			grey rush	Juncaceae	Y	Graminoid
Luzula	*comosa*			hairy woodrush	Juncaceae	Y	Graminoid
Scirpus	*microcarpus*			mountain bog bulrush	Cyperaceae	Y	Graminoid
Vulpia	*myuros*			rattail sixweeks grass	Poaceae	N	Graminoid
Achlys	*triphylla*			vanilla leaf	Berberidaceae	Y	Herb
Acmispon	*americanus*			Spanish lotus	Fabaceae	Y	Herb

1/10/24
221.13
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
PART OF PLAN
Sec. IV

Scientific Name				COMMON NAME	FAMILY	NATIVE	FORM
Acmispon	*brachycarpus*			short podded lotus	Fabaceae	Y	Herb
Adenocaulon	*bicolor*			trail plant	Asteraceae	Y	Herb
Anisocarpus	*madioides*			woodland madia	Asteraceae	Y	Herb
Aralia	*californica*			elk clover	Araliaceae	Y	Herb
Asarum	*caudatum*			creeping wild ginger	Aristolochiaceae	Y	Herb
Asyneuma	*prenanthoides*			California harebell	Campanulaceae	Y	Herb
Boykinia	*occidentalis*			western boykinia	Saxifragaceae	Y	Herb
Cardamine	*californica*			milkmaids	Brassicaceae	Y	Herb
Carduus	*pycnocephalus*			Italian thistle	Asteraceae	N	Herb
Cephalanthera	*austiniae*			phantom orchid	Orchidaceae	Y	Herb
Cerastium	*glomeratum*			mouse ear chickweed	Caryophyllaceae	N	Herb
Chimaphila	*menziesii*			pipsissewa	Ericaceae	Y	Herb
Claytonia	*sibirica*			candy flower	Montiaceae	Y	Herb
Collomia	*heterophylla*			varied leaf collomia	Polemoniaceae	Y	Herb
Conium	*maculatum*			poison hemlock	Apiaceae	N	Herb
Cynoglossum	*grande*			western hounds tongue	Boraginaceae	Y	Herb
Epilobium	*ciliatum*	ssp.	*watsonii*	fringed willow herb	Onagraceae	Y	Herb
Erythranthe	*moschata*			musk monkeyflower	Phrymaceae	Y	Herb
Fragaria	*vesca*			wild strawberry	Rosaceae	Y	Herb
Galium	*aparine*			cleavers	Rubiaceae	Y	Herb
Galium	*trifidum*	ssp.	*columbianum*	three petal bedstraw	Rubiaceae	Y	Herb
Gallium	*californicum*	ssp.	*californicum*	California bedstraw	Rubiaceae	Y	Herb
Gamochaeta	*ustulata*			featherweed	Asteraceae	Y	Herb
Geranium	*molle*			crane's bill geranium	Geraniaceae	N	Herb
Geranium	*dissectum*			wild geranium	Geraniaceae	N	Herb
Goodyera	*oblongata*			rattlesnake plantain	Orchidaceae	Y	Herb
Heuchera	*micrantha*			alum root	Saxifragaceae	Y	Herb
Hypericum	*androsaemum*			sweet amber	Hypericaceae	N	Herb

1/10/21
221.14
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
PART OF PLAN
Sec. IV

Scientific Name				COMMON NAME	FAMILY	NATIVE	FORM
Hypericum	*perforatum*			common St. John's wort	Hypericaceae	N	Herb
Hypochaeris	*radicata*			hairy cats ear	Asteraceae	N	Herb
Iris	*douglasiana*			Douglas' iris	Iridaceae	Y	Herb
Leontodon	*saxatilis*			hawkbit	Asteraceae	N	Herb
Leucanthemum	*vulgare*			oxeye daisy	Asteraceae	N	Herb
Linum	*bienne*			narrow leaved flax	Linaceae	N	Herb
Lysimachia	*latifolia*			Pacific starflower	Myrsinaceae	Y	Herb
Madia	*gracilis*			gumweed	Asteraceae	Y	Herb
Madia	*sativa*			coastal tarweed	Asteraceae	Y	Herb
Maianthemum	*racemosa*			false Solomon's seal	Ruscaceae	Y	Herb
Maianthemum	*stellatum*			starry false lily of the valley	Ruscaceae	Y	Herb
Mentha	*pulegium*			penny royal	Lamiaceae	N	Herb
Myosotis	*latifolia*			forget-me-not	Boraginaceae	N	Herb
Navarretia	*squarrosa*			skunkweed	Polemoniaceae	Y	Herb
Nemophila	*heterophylla*			variable leaved nemophila	Boraginaceae	Y	Herb
Nemophila	*parviflora*	var.	*parviflora*	small flowered nemophila	Boraginaceae	Y	Herb
Oenanthe	*sarmentosa*			water parsley	Apiaceae	Y	Herb
Osmorhiza	*berteroi*			sweet cicely	Apiaceae	Y	Herb
Oxalis	*oregona*			redwood sorrel	Oxalidaceae	Y	Herb
Petasites	*frigidus*			western coltsfoot	Asteraceae	Y	Herb
Phacelia	*bolanderi*			redwood phacelia	Boraginaceae	Y	Herb
Pityopus	*californicus*			California pinefoot	Ericaceae	Y	Herb
Plantago	*lanceolata*			ribwort	Plantaginaceae	N	Herb
Plantago	*major*			common plantain	Plantaginaceae	N	Herb
Plantago	*subnuda*			coastal plantain	Plantaginaceae	Y	Herb
Polygala	*californica*			California milkwort	Polygalaceae	Y	Herb
Prosartes	*smithii*			large flower fairybells	Liliaceae	Y	Herb
Prunella	*vulgaris*			selfheal	Lamiaceae	Y	Herb

1/10/21
2.21.15
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
PART OF PLAN
Sec. IV

Scientific Name				COMMON NAME	FAMILY	NATIVE	FORM
Pyrola	*picta*			white veined wintergreen	Ericaceae	Y	Herb
Ranunculus	*californicus*			common buttercup	Ranunculaceae	Y	Herb
Ranunculus	*parviflorus*			small flower buttercup	Ranunculaceae	N	Herb
Ranunculus	*repens*			creeping buttercup	Ranunculaceae	N	Herb
Rumex	*conglomeratus*			green dock	Polygonaceae	N	Herb
Rumex	*salicifolius*			willow-leaved dock	Polygonaceae	N	Herb
Sanicula	*crassicaulis*			Pacific sanicule	Apiaceae	Y	Herb
Scoliopus	*bigelovii*			slink pod	Liliaceae	Y	Herb
Scrophularia	*californica*			California bee plant	Scrophulariaceae	Y	Herb
Silybum	*marianum*			milkthistle	Asteraceae	N	Herb
Sisyrinchium	*bellum*			western blue eyed grass	Iridaceae	Y	Herb
Spergularia	*rubra*			purple sand spurry	Caryophyllaceae	N	Herb
Stachys	*ajugoides*	var.	*rigida*	ridge hedge nettle	Lamiaceae	Y	Herb
Stellaria	*media*			chickweed	Caryophyllaceae	N	Herb
Tellima	*grandiflora*			fringecups	Saxifragaceae	Y	Herb
Tiarella	*trifoliata*	var.	*unifoliata*	sugarscoop	Saxifragaceae	Y	Herb
Torilis	*arvensis*			field hedge parsley	Apiaceae	N	Herb
Torreya	*californica*			California nutmeg	Taxaceae	Y	Herb
Trifolium	*dubium*			shamrock clover	Fabaceae	N	Herb
Trifolium	*willdenovii*			tomcat clover	Fabaceae	Y	Herb
Trifolium	*repens*			white clover	Fabaceae	N	Herb
Trillium	*ovatum*			western trillium	Melanthiaceae	Y	Herb
Typha	*latifolia*			common cattail	Typhaceae	Y	Herb
Urtica	*dioica*			stinging nettle	Urticaceae	Y	Herb
Vancouveria	*planipetala*			redwood inside out flower	Berberidaceae	Y	Herb
Veratrum	*fimbriatum*			fringed corn lily	Melanthiaceae	Y	Herb
Veronica	*americana*			American brooklime	Plantaginaceae	Y	Herb
Vicia	*hirsuta*			hairy vetch	Fabaceae	N	Herb

1/10/21
221.16
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
PART OF PLAN
Sec IV

Scientific Name				COMMON NAME	FAMILY	NATIVE	FORM
Vicia	*lutea*			smooth yellow vetch	Fabaceae	N	Herb
Viola	*glabella*			stream violet	Violaceae	Y	Herb
Viola	*sempervirens*			redwood violet	Violaceae	Y	Herb
Arctostaphylos	*columbiana*			redwood manzanita	Ericaceae	Y	Shrub
Ceanothus	*thyrsiflorus*			blue blossom	Rhamnaceae	Y	Shrub
Corylus	*cornuta*			beaked hazelnut	Betulaceae	Y	Shrub
Euonymus	*occidentalis*			western burning bush	Celastraceae	Y	Shrub
Gaultheria	*shallon*			salal	Ericaceae	Y	Shrub
Genista	*monspeliensis*			French broom	Fabaceae	N	Shrub
Hedera	*helix*			English ivy	Araliaceae	N	Shrub
Lonicera	*hispidula*			hairy honeysuckle	Caprifoliaceae	Y	Shrub
Morella	*californica*			wax myrtle	Myricaceae	Y	Shrub
Rhododendron	*macrophyllum*			California rose bay	Ericaceae	Y	Shrub
Rhododendron	*occidentalis*			western azalea	Ericaceae	Y	Shrub
Rosa	*nutkana*			nootka rose	Rosaceae	Y	Shrub
Rosa	*rubiginosa*			sweet brier	Rosaceae	N	Shrub
Rubus	*armeniacus*			Himalayan blackberry	Rosaceae	N	Shrub
Rubus	*leucodermis*			black-cap raspberry	Rosaceae	Y	Shrub
Rubus	*parviflorus*			thimbleberry	Rosaceae	Y	Shrub
Rubus	*spectabilis*			salmonberry	Rosaceae	Y	Shrub
Rubus	*ursinus*			California blackberry	Rosaceae	Y	Shrub
Salix	*lasiolepis*			arroyo willow	Salicaceae	Y	Shrub
Toxicodendron	*diversilobum*			poison oak	Anacardiaceae	Y	Shrub
Vaccinium	*ovatum*			evergreen huckleberry	Ericaceae	Y	Shrub
Vaccinium	*parviflorum*			red huckleberry	Ericaceae	Y	Shrub
Whipplea	*modesta*			whipplea	Hydrangaceae	Y	Shrub
Abies	*grandis*			grand fir	Pinaceae	Y	Tree
Acacia	*dealbata*			silver wattle	Fabaceae	N	Tree

1/10/21
221,17
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
PART OF PLAN
Sec. IV

Scientific Name				COMMON NAME	FAMILY	NATIVE	FORM
Acer	*macrophyllum*			big leaf maple	Sapindaceae	Y	Tree
Alnus	*rubra*			red alder	Betulaceae	Y	Tree
Arbutus	*menziesii*			Pacific madrone	Ericaceae	Y	Tree
Chrysolepis	*chrysophylla*			golden chinquapin	Fagaceae	Y	Tree
Frangula	*purshiana*			cascara	Rhamnaceae	Y	Tree
Notholithocarpus	*densiflorus*			tanoak	Fagaceae	Y	Tree
Pinus	*muricata*			bishop pine	Pinaceae	Y	Tree
Pittosporum	*undulatum*			Australian chess wood	Pittospraceae	N	Tree
Pseudotsuga	*menziesii*			Douglas' fir	Pinaceae	Y	Tree
Salix	*lasiandra*	var.	*lasiandra*	Pacific willow	Salicaceae	Y	Tree
Salix	*scouleriana*			Scouler's willow	Salicaceae	Y	Tree
Salix	*sitchensis*			sitka willow	Salicaceae	Y	Tree
Sambucus	*racemosa*			red elderberry	Adoxaceae	Y	Tree
Sequoia	*sempervirens*			redwood	Cupressaceae	Y	Tree
Tsuga	*heterophylla*			western hemlock	Pinaceae	Y	Tree
Umbellularia	*californica*			California bay	Lauraceae	Y	Tree

1/10/21

221.18

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Sec. IV

Report Author:

Christina M Wagner
Christina Wagner received a B.S. in Environmental Protection from West Virginia University in 2006 and moved to California in fall of 2006 to begin her career. Since 2007, she has worked for the Trinity County Resource Conservation District, the US Forest Service, Natural Resource Management, and the California Department of Transportation performing botanical surveys, native habitat restoration, native plant program management, noxious weed management, and wetland delineations in Trinity, Humboldt, and Mendocino counties. Ms. Wagner currently prepares, implements, and monitors Restoration Plans for projects requiring compliance with the California Environmental Quality Act (CEQA) and National Environmental Protection Act (NEPA) through meeting permit requirements for agencies including Water Quality Control Board, US Army Corps of Engineers, the California Coastal Commission, and the California Department of Fish and Wildlife.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/21 221,19 Sec. IV

PART OF PLAN

D. RECREATION ASSESSMENT -

Past and Future Activities.

The THP area is privately held timber property that is closed to general public access. However, public recreation activities are sometimes allowed that are compatible with the company's management goals. Portions of the landowner's property are utilized occasionally by local residents for hiking, riding, bird watching, picnicking, bicycling, hunting, and other recreational purposes. All of this activity occurs either as a result of trespass or by permit issued by the company. The Gualala River that is accessible by the public is from the confluence of the North Fork and the South Fork Gualala River and is downstream from the proposed harvest area and this stretch of river is utilized for swimming, fishing, drift boat fishing, canoeing and kayaking. The THP area is behind locked gates and public access is not allowed without a permit. Based on the location of the plan no impacts to recreational use are expected to occur.

Findings: The assessment area for recreation resources includes the THP area, plus the area within 300 feet of the THP boundaries. The assessment area as described seems appropriate for an assessment of potential significant effects to the recreational resources which may occur in the vicinity of the plan area. This area is private rural forested property. On such a property, there is an expectation that timber operations will occur periodically. This land is not open to the public for recreational use and is behind locked gates. Access during falling operations may have to be tightly controlled for safety purposes due to the presence of open gates as logging crews enter and leave the property, but nothing else proposed in this THP will significantly affect recreational opportunities. Conventional logging operations are not known to have caused any significant adverse impacts to recreation resources in the area in the past, therefore, none are anticipated from this THP, either singly or cumulatively.

RECEIVED

MAR 16 2021

COAST AREA OFFICE
RESOURCE MANAGEMENT

E. VISUAL ASSESSMENT -

Past and Future Activities -See table at beginning of CWE for past activities.

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT

No portion of this THP will be visible from the river or from public roads or private homes. There will be no visual impact from timber harvesting on the public from using the Gualala River or public roads or on landowners in adjacent watersheds.

Finding: Given the stated selection silviculture method proposed for the plan there will be no discernable visual change to the timbered hillslopes, river corridor, or timbered skyline. Thus, regardless of viewing distance there will be no immediate significant adverse impact or cumulative effects relating to visual resources with the operation of this harvest plan.

F. TRAFFIC ASSESSMENT -

Past Activities.

The roads listed at the beginning of this Section under Traffic Assessment Areas have a long history of log hauling use going back to the 1940's. Since the advent of the log truck appurtenant public haul roads have seen continuous annual use in the transportation of forest products to the present day.

Vehicular Traffic Impacts:

The assessment area for traffic is the private road system south of the THP to county road 501 and from there to Old State Hwy and then to Hwy 1 or north of the THP to the Fish Rock Road and from there to the Old Stage Road and then to Hwy 1. See appurtenant road map in section II.

These roads have historically been used as haul routes for timber and for other agricultural purposes. Annual harvest of timber from timberland owners in both Mendocino and Sonoma counties has decreased in the last two decades and consequently the log truck traffic has also decreased on the major highways. Tourist traffic and resident traffic has likely increased over the same period. County Road 501 has been the main route for log hauling from the northern half of the landowner's property for over 60 years and the same route was used to remove logs by rail as far back as 100 years ago. The log truck traffic generated from this ownership has been relatively steady for several decades and will probably remain at similar levels for the foreseeable future. The log truck flow off the plan area will enter public roads from one location once they leave the GRT's property. Logs leaving GRT will enter onto County Road 501 (county paved) west of the Green Bridge that crosses the North Fork of the Gualala River and will head west to Hwy 1 at the town of Gualala. This public road has received extensive log truck annually over the last six decades. Maintenance issues on public roads are primarily limited to County Road 501. This road is subject to potholes. The County addresses this issue by applying cold patch to the potholes almost yearly. Unfortunately, cold patch is not a long-term fix and potholes return shortly after being repaired. Harvesting of this THP will not alter or measurable change the annual log flow off the property or within the greater Gualala River subbasin.

Finding: This project will not significantly add to the annual truck traffic that leaves the property each harvest season. Local log truck traffic created by this project added to local traffic of other types is not expected to create a significant adverse cumulative impact to traffic on local public roads.

G. NOISE ASSESSMENT-

The nearest residences are approximately ¼ mile away from the extreme southern end of this THP. Noise from this portion of unit 1 may be noticeable at these residences for a short period (a few days to a few weeks). There will also be noise from log truck traffic on County road 501 and the Fish Rock road during

PART OF PLAN

operations. Log truck traffic noise is a common annual occurrence on all of the roads to be used for this THP and since the annual harvest from this landowner is relatively consistent there is no additive cumulative effect from this noise resulting from this harvest plan.
Potential noise impacts that may occur with harvesting and hauling of logs off this THP will be of short duration (6 to 8 weeks) and will not be measurably additive with other ongoing projects that may occurring in the area. Harvesting and truck noise is not anticipated to be any more prevalent than what has occurred in past years.

Finding: No significant and/or cumulative impacts related to noise will occur as a result of this operation.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT

H. Global Warming- Climate Change and Forestry Practice

1. Climate Change in General.

The vast majority of climate scientists have concluded that the earth's climate is currently warming at a rate that is unprecedented in human history. Their conclusions are based on temperature data, samples of carbon dioxide (C02) content in prehistoric ice and sediment, and climate models. The evidence of global climate change is undeniable except for a few scientists.

The scientific view that has gained greatest acceptance in current public policy is that extraordinary emissions of greenhouse gases (GHG) from human activities are promoting warming of the earth's atmosphere.

While scientific inquiry continues, public policies favor the view that climate change is occurring and is driven by extraordinary GHG emissions from human activities. In response, the State of California has enacted legislation and policies designed to reduce greenhouse gas emissions and to increase energy efficiency (AB 1493, 2002; AB 32, 2006; Gov. Schwarzenegger Executive Order S-3-05). The Executive Order established greenhouse gas emission targets using 1990 thresholds and established the California Climate Action Team to coordinate the State's efforts to reduce and report on progress of those efforts and on impacts of global warming to the State.

Carbon dioxide (CO_2) is considered the greenhouse gas (GHG) that has the greatest effect on the dynamic of global warming due to the fact that it composes the vast majority of the releases by human activities. There are two basic ways carbon emissions are reduced. First is efficiency, where technology or conservation reduces carbon emissions through the use of less energy (electricity, fuel, heat, etc.) to accomplish an activity. Second is storage, which can be accomplished through geologic or terrestrial sequestration.

Forest activities can result in emissions through harvesting, wildfire, pest mortality and other natural and anthropogenic events. However, forestry is a net sink for carbon, the primary greenhouse gas. Plants absorb CO_2 from the air and use the carbon as a building block of plant tissue through the process of photosynthesis. Worldwide forests store approximately 360 billion tons (Gt) of Carbon in live biomass, with an additional 500 Gt stored in dead material (Pan et al 2013). An acre of mature redwood can store between 600-700 ton/ac of CO_2, which is the highest of any forest type on Earth. Though redwood forests can store the largest amounts of GHGs per acre of any forest type, the expanse of this forest type is not significant on a global level. The most recent draft Greenhouse Gas Inventory shows the forestry sector to be a net sink with emissions of 6.1 MMT CO_2 EQ. and emissions reductions of 21 MMT CO_2 EQ (Bemis, 2006).

The forest sector offers the ability to reduce emissions through a suite of possible activities: 1) substitute

PART OF PLAN

PART OF PLAN

wood products for more energy-intensive products, 2) reduce demand for energy in growing timber, harvesting, and wood processing, 3) reduce biomass burning (wildfires), 4) afforest marginal croplands, 5) reduce conversion of forestland to nonforest use, 6) improve forest management, 7) reduce harvest, 8) increase agro-forestry, 8) plant trees in urban areas, 9) other combinations (Joyce and Nungesser, 2000). This proposed THP uses several of the activities which are considered to have the effect of reducing the overall forest emissions and improving the storage of GHGs. The harvest will add to the carbon stored in wood products, while at the same time increase the rate of carbon storage by maintaining a healthy, fast-growing forest. Forest management may result in a reduced risk for wildfire and will maintain maximum sustained productivity of quality forest products. By maintaining timber management there is a reduced risk of deforestation through conversion of the land to non-forest uses.

2. CEQA Analysis Related to Climate Change

The California Global Warming Solutions Act of 2006 (AB 32) is California's legislative effort aimed at reducing GHG emissions. Pursuant to AB 32, 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. On June 26, 2008 CARB staff presented the initial draft of the AB 32 Scoping Plan for Board review. The Scoping Plan was first considered by the Board in 2008 and must be updated every five years. CARB has updated the Scoping Plan in 2014 (First Update) and again in 2017 (2017 Scoping Plan). Details regarding the latest update are outlined below.

2017 Scoping Plan Update extended the goals of AB 32 and set a 2030 goal of a 40 percent emissions reduction below 1990 levels. The 2017 Scoping Plan incorporates, coordinates, and leverages many existing and ongoing efforts and identifies new policies and actions to accomplish the State's climate goals. It builds upon the successful framework established by the Initial Scoping Plan and First Update, while identifying new, technologically feasible, and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. It also includes policies to require direct GHG reductions at some of the State's largest stationary sources and mobile sources. These policies include the use of lower GHG fuels, efficiency regulations, and the Cap-and-Trade Program, which constrains and reduces emissions at covered sources.

What are the key focus areas in the 2017 Scoping Plan? - CARB plans to focus on several topics, including enhancing industrial efficiency, transportation, securing water supplies, clean air, putting waste resources to beneficial use, and supporting resilient agriculture and natural and working lands.

What is the status of AB 32 implementation? - The California Global Warming Solutions Act of 2006 (AB 32) has been implemented effectively with a suite of complementary strategies that serve as a model going forward. California is on target for meeting the 2020 GHG emission reduction goal. Many of the GHG reduction measures (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted over the last several years and implementation activities are ongoing. California is seeing real reductions to put the state on track for reducing GHG emissions to achieve the AB 32 goal of getting back to 1990 levels by 2020.

In addition to the 2017 Scoping Plan, the California Forest Carbon Plan completed in May of 2018 presents an assessment of forest health across California based on the best currently available information. This plan provides a description of anticipated future conditions given the ongoing and expected impacts of

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

climate change on forested ecosystems and lays out a set of forest management goals to move the state's forests towards a more ecologically resilient state. These goals include:

1. Enhance: Expand and improve forest management to enhance forest health and resilience, resulting in enhanced long-term carbon sequestration and storage potential.

2. Protect: Increase protection of California's forested lands and reduce conversion to non-forest uses, resulting in a more stable forested land base.

3. Innovate: Pursue innovations in wood products and biomass utilization in a manner that reduces or offsets GHG emissions; promotes land stewardship; and strengthens rural economies and communities.

PART OF PLAN

The Forest Carbon Plan provides guidance and input to the Natural and Working Lands Implementation Plan described in the 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 state-wide 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.

3. The Project:

The proposed project will result directly and indirectly in carbon sequestration and temporary, insignificant C02 emissions. Carbon sequestration is achieved through a repeating cycle of harvesting and growing of trees that remove C02 from the atmosphere and store carbon in tree fiber. When a tree is harvested, most of the carbon-filled tree fibers become lumber that is sequestered in buildings while a new rotation of trees is planted and grown. To the extent these wood building products replace the demand for new concrete or steel building components; they reduce substantial C02 emissions that are associated with the manufacture of cement and steel. Some of the tree fibers such as branches and tops are left in the forest where they are sometimes burned to reduce fire hazard. However, the vast majority of this material is left to decay and will emit C02 overtime; but it also supplements the forest soils and forest duff layer where carbon is stored and serves as a substrate and nutrient for more tree growth.

Using the CALFIRE GHG calculator, it is estimated that GHG sequestration for this project will be 45,598 metric tons of CO2 over the 100 year planning horizon. This sequestration total includes emissions from site preparation, non-biological emissions associated with harvesting and non-biological emissions associated with milling. GHG emissions associated with this project are insignificant relative to global CO2 emissions that are thought to affect climate. There is virtually no opportunity to reduce these emissions in a manner that would meaningfully benefit the climate because they are already miniscule. (U.S.E.P.A. 2005). An acre of managed forest may be entered with equipment once every 15-20 years with emissions measured in hours of equipment operation over that time period. Few if any other land uses can match the low intensity of CO2 emissions over space and time that are associated with commercial forestry. In urban areas of California, a typical California household will operate one or more vehicles every day and the demands of that household will induce a variety of additional CO2 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 over 20 years - not once every 20 years.

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

The insignificant GHG effects of the proposed project are further diminished by the mitigating effects of carbon sequestered in wood products produced from harvest and by the forest stewardship principals used by Gualala Redwood Timber, which strives to increase forest stocking over time.

At the project scale, the beneficial impacts on carbon sequestration and the project-related CO2 emissions related to global warming are negligible and undetectable at the global scale. The CO2 emissions from vehicles used to implement the project over several weeks or months are dwarfed by the CO2 emissions from other routine daily activities engaged in by all Californians such as a single morning commute for even one city. Also, impacts from transportation will be further mitigated by the implementation of new standards for diesel engines recently adopted by the CARB (CARB 2008). When considering the impacts of this project on climate it is doubtful that a measurable change could be detected, even at the microclimate level.

4. State Setting and Area of Assessment.

PART OF PLAN

The assessment area for climate effects is the California timberland ownership of GRT and the public transportation routes for the delivery of the logs to the manufacturing centers. Because the use and disposition of manufactured wood products is not under the control of GRT after it is delivered to the primary manufacturing center, the direct GHG emissions of manufacturing activities are not estimated here. However, qualitative consideration of the carbon cycle in wood products is addressed as a cumulative effect.

There are 16.6 million acres of productive public and private timberland (statutorily available for harvest) in California (California Department of Forestry 2003). GRT owns 29,000 acres in Sonoma and Mendocino counties. This represents 0.17% of the total timberland, and 0.4% of the 7.3 million acres of the private timberlands in the state. This proposed timber harvesting plan includes 141 acres that are actually being harvested which represent only 0.000019% of the total private timberland 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 record keeping 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 2018, the harvest level had dropped to 1,580 million board feet (SBE Harvest Tables).

5. Carbon Sequestration, Emissions, and Land Use Resulting from Intensive Forest Management

Forestlands are, in general, a carbon sink where C02 is captured and fixed by the process of photosynthesis, which removes carbon from the atmosphere and sequesters carbon in wood fiber (OFRI 2006, 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 C02 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

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

PART OF PLAN

through decline, death, or consumptive use.

Managed commercial forests make a significant contribution to the sequestration of carbon and mitigation of GHG (IPCC 2007; 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 C02 emissions from timberland management, timber harvest, and forest products 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 (Id). 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 material. 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% percent (US Dept of Energy- I605(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, C02 emissions are reduced because there is less demand for steel and concrete, which are manufactured with large C02 emissions as a byproduct (IPCC 2007; 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 (Id). When wood residues are used in this way, there is no increase in C02 emissions from their combustion because the same emissions will result from the oxidation and decay of wood residue. However, more significant C02 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.

The proposed project is one of numerous pasts, present, and future timber harvest projects on the Plan Submitter's ownership that combines to produce substantial net carbon sequestration benefits over time. These timberlands are sustainably managed in accordance with California law such that the harvest of timber through past, present, and future projects will not exceed the long-term tree growth of the California timberlands. Timber harvests are conducted in small patches across the ownership and promptly replanted to begin a new cycle of tree growth and carbon sequestration. Harvested timber is converted to wood products that sequester carbon as building materials. To some degree, these building products substitute for C02 intensive steel and cement building components.

The cumulative beneficial effects of the proposed project as part of the Plan Submitter's intensive forest management are expected to sustain the current timber production land use and reduce the risk of wildfire, which are, in turn, beneficial impacts on GHG emissions and carbon sequestration. Land use

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MA

conversion from forestry to other uses has a negative impact on GHG (OFRI 2006). In addition, catastrophic wildfires are enormous emitters of C02 and often reduce or destroy the carrying capacity of forest soils to regenerate growing forests (Id). Both of these adverse impacts to GHG are prevented with successful intensive management of forestland for timber production. The project and similar, past, present, and future projects on the Plan Submitter's timberlands are essential to successful intensive forest management that prevents land use conversion.

PART OF PLAN

6. Effects of Climate Change on Timberlands

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 very uncertain (IPCC 2007). It is a certainty that the earth's climate has changed in the past with variable cooling and warming trends, but no models exist 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 2007).

In the face of uncertainty, the impacts of climate change must be assessed in terms of the resilience of the Plan Submitters timberlands should climate changes occur. There are several indications that these timberlands have been and continue to be resilient. After more than a century of timber harvest, most of which occurred without the benefits of modern forest practices regulations and best management practices, these timberlands remain among the most productive forest lands in the world. A key tree species on these timberlands is the California redwood *(Sequoia sempervirons),* which is the epitome of resilience, having persisted for millennia in the coastal climate of northern California. The redwood tree is not expected to be threatened by pests that might be advantaged by global warming, and it is expected to persist at the southern end of its range even if climate change brings higher temperatures and less precipitation (Battle 2006). The redwood tree also benefits from coppice regeneration, which means that it regenerates 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 required planting of seedlings to promote healthy stocking levels on every harvested area.

In addition to redwood, these timberlands grow hearty and resilient species such as Douglas-fir, a species that thrives in open stands following even age harvest. Douglas-fir grows in a variety of climates throughout western North America and is believed to have rapidly colonized areas that are now vast forestlands following the end of the last Ice Age. Through its substantial and continuous investment in reforestation and productive regeneration of forest stands, the Plan Submitter has a strong incentive to nurture healthy and resilient forest stands on its property.

In summary, both the IPCC and U.S. EPA have recognized the positive effects that forests and forest products have on the world's climate. The above qualitative discussion demonstrates that the proposed

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

project as presented and mitigated, in combination with past, present, and reasonably foreseeable probable future projects will not cause, or add to significant cumulative GHG impacts within the assessment area. Following is a project specific quantitative analysis which further demonstrates the proposed operations will result in a net sequestration of greenhouse gases.

Finding: Based on an analysis of CO2 emissions using the Cal Fire Carbon Calculator from the harvest of trees and corresponding emissions from harvest and transport equipment, this harvest impacts will be short lived and the regrowth of the forest and the storage of carbon in wood products generated from the log harvested will result in negligible impacts to climate change. The proposed project as presented and mitigated, in combination with past, present, and reasonably foreseeable future projects on the GRT property will not cause or add to significant cumulative impacts to climate change or greenhouse gases within the assessment area.

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Little THP – GHG Summary Estimate

Emissions Source/Sink/Reservoir	Total Tonnes CO_2 Sequestered/Emitted
Live Trees	34,474
Wood Products	14,674
Site Prep Emissions	0
Non-Bio Harvest Emissions	-716
Non-Bio Milling Emissions	-260
Total Sequestration	45,598
Years to Recoup	9 years

RECEIVED
APR 28 2021
COAST AREA
RESOURCE MANAGEMENT

References for GHG and Climate Change Cumulative Impact Analysis

California's Forest Resources: Forest Inventory and Analysis, 2001–2010, USDA, February 2016

California's 2017 Climate Change Scoping Plan, ARB.ca.gov, Nov 2017
California Forest Carbon Plan, California Department of Forestry and Fire Protection, California Natural Resources Agency, California Environmental Protection Agency, May 2018.

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

Bemis, Gerry. 2006, December. Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004. Report CEC-600-2006-013-SF.

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'." California Department of Forestry and Fire Protection 2003. The Changing California; Forest and Range 2003 Assessment. http://frap.fire.ca.gov/assessment2003/Assessment Summary/assessment summary.html

California Energy Commission. 2004. Baseline Greenhouse Gas Emissions for Forest, Range, and Agricultural Lands in California. http://www.energy.ca.gov/reports/CEC-500-2004-069/CEC-500-2004-069F.PDF

James, c.; B. Krumland, and P. Eckert. 2007. Carbon Sequestration in California Forests; Two Case Studies in Managed Watersheds.
http://www.spi-ind.com/html/pdf_forests/CARBONSEQUESTRATION.pdf

Joyce, LA and Nungesser, M 2000, Ecosystem Productivity and the Impact of Climate Change, in The Impact of Climate Change on America's Forests, LA Joyce and R Birdsey (eds), Technical Report RMRS-GTR-59, USDA Forest Service, Fort Collins

Lippke, B.; J. Perez-Garcia, J. Bowyer, J. Meil. 2004. CORRIM: Life Cycle Environmental Performance of Renewable Building

PART OF PLAN

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%20Hi11%20Foresflllo20Carbon%20Study.pdf

Oregon Forest Resources Institute (OFRI). 2006. Forests, Carbon and Climate Change: A Synthesis of Scientific Findings. http://www.oregonforests.org/media/pdf/CarbonRptFinal.pdf

Pan, Y.; Birdsey, R.A.; Phillips, O.L.; Jackson, R.B. 2013. The structure, distribution, and biomass of the world's forests. Annual Review of Ecology, Evolution, and Systematics 44: 593–622.

Perez-Garcia, J.; B. Lippke, J. Comnick, 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.

United Nations Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter9.pdf

U.S. Department of Agriculture, Forest Service. 2007. Forest Inventory and Analysis 2007. http://www.fs.fed.us/pnw/fia/

U. S. Department of Energy. 2005. I605(b) Tables. http://www.eia.doe.gov/oiaf/1605/index.html

U.S. Environmental Protection Agency (U.S.E.P.A.). 2005. Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture. http://www.epa.gov/sequestration/pdf/greenhousegas2005.pdf

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. Senate, Environment and Public Works Committee. 2008. Minority Report: More Than 650 International Scientists Dissent Over Man-Made Global Warming Claims. http://epw.senate.gov/public/index.cfm?FuseAction=Minority.Blogs&ContentRecord

California's Forest Resources: Forest Inventory and Analysis, 2001–2010 USDA published February 2016

PART OF PLAN

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT

Project Specific Greenhouse Gas Analysis

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Little THP Summary (single tree selection/tractor)			Years until Carbon Stocks are Recouped from Initial Harvest (Includes Carbon in Live Trees, Harvested Wood Products, and Landfill)
	Beginning Stocks	Ending Stocks	
Emissions Source/Sink/Reservoir	Metric Tonnes CO2 Equivalent Per Acre Basis		9 Years
Live Trees (Conifers and Hardwoods)	252.58	344.74	
Wood Products		146.74	
Site Preparation Emissions		0.00	
Non-biological emissions associated with harvesting		-7.16	
Non-biological emissions associated with milling		-2.60	
Sum of Net Emissions/Sequestration over Identified Harvest Cycles (CO2 metric tonnes)		229.14	
Project Summary			
Project Acres	Step 17- Insert the acres that are part of the harvest area.	199	
Total Project Sequestration over defined Harvesting Periods (CO2 metric tonnes)		45,598	

PART OF PLAN
RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

221.31a

1/10/2021

Little THP Selection/Tractor Project Carbon Accounting: Inventory, Growth, and Harvest

This worksheet addresses the sequestation and emissions associated with the project area's balance of harvest, inventory, and growth plus any emissions associated with site preparation. Complete the input for Steps 0- 8 on this worksheet.

Forest Type				Harvest Periods		Inventory		Growth Rates		Harvest Volume	
Multipliers to Estimate Carbon Tonnes per MBF (Gampson, 2002)				Time of Harvest (years from project approval)		Conifer Live Tree Volume (MBF/Acre) - Prior to Harvest	Hardwood Live Tree Volume (BA square feet/Acre) - Prior to Harvest	Conifer Growth Rate BF/Acre/Year	Hardwood Growth Rate BA/Acre/Year	Conifer Harvest Volume (MBF/acre)	Hardwood Harvested / Treated Basal Area (BA/Acre)
Forest Type	Identify the approximate percentage of conifers by volume within the harvest plan. Must sum to	Multiplier from Cubic Feet (merchantable) to Total Biomass	Pounds Carbon per Cubic Foot	Step 1. Enter the anticipated future harvest entries. The re-entry cycles should be supported by management plan, if available.		Step 2. Enter the estimated conifer inventory (mbf/acre) present in project area prior to harvest.	Step 3. Enter the estimated hardwood inventory (basal area per acre) present in project area prior to harvest.	Step 4. Enter the average annual periodic growth of conifers between harvests based on estimated growth in management plan, if available. Must be entered for each harvest cycle identified in	Step 5. Insert average annual periodic growth of hardwoods between harvests based on estimated growth in management plan, if available.	Step 6. Enter the estimated conifer harvested per acre at current and future entries. The estimate should be based on projections from the management plan, if	Step 7. Enter estimated hardwood basal area harvested/treated per acre
Douglas-fir	1%	1.575	14.38		0	40	10	1000	0.1	13	0
Redwood	99%	1.675	13.42		15	42	11.5	1000	0.1	13	0
Pines	0%	2.254	12.14		30	44	13	1000	0.1	13	0
True firs	0%	2.254	11.18		45	46	14.5	1000	0.1	13	0
Hardwoods	[redacted]	2.214	11.76		60	48	16	1000	0.1	13	0
Conversion of Board Feet to Cubic Feet	0.165	Pounds per Metric Tonne	2,204	User must enter harvest cycles to 100 years and/or at least three entry cycles.	75	50	17.5	1000	0.1	13	0
Multipliers to Estimate Total Carbon Tonnes per MBF	Conifer	1.68			90	52	19	1000	0.1	13	0
	Hardwoods	1.95			105	54	20.5	1000	0.1	13	0
Multipliers to Estimate Merchantable Carbon Tonnes per MBF	Conifer	1.01			0	0	0	0	0	0	0
	Hardwoods	0.88			0	0	0	0	0	0	0

Harvest Periods	Inventory Conversion to Carbon (prior to harvest)		Inventory Conversion to Carbon Dioxide Equivalent (prior to harvest)		Site Preparation	
	Conifer Live Tree Tonnes (C/acre)	Hardwood Live Trees Tonnes (C/acre)	Conifer Live Tree Tonnes (CO_2 equivalent/acre)	Hardwood Live Tree Tonnes (CO_2 equivalent/acre)	Step 8. Enter the value (in bold) for each harvest cycel that best reflects the site preparation activities, as averaged across the project area:	
from above (Time of Harvest as years from project approval)	Computed: MBF * Conifer Multiplier from Step 0.	Computed: BA*Volume/Basal Area Ration (to convert to MBF) * Hardwood Multiplier from Step 0.	Computed: Conversion of carbon to CO_2 (3.67 tonnes CO2 per 1 tonne Carbon)	Computed: Conversion of carbon to CO_2 (3.67 tonnes CO2 per 1 tonne Carbon)	Heavy- 50% or more of the project area is covered with brush and removed as part of site preparation or stumps are removed (mobile emissions estimated at .429 metric tonnes CO2e per acre, biological emissions estimated at 2 metric tonnes CO2e per acre)	
					Medium - >25% <50% of the project area is covered with brush and removed as part of site preparation (mobile emissions estimated at .202 metric tonnes CO2e per acre, biological emissions estimated at 1 metric tonne per acre).	
					Light - 25% or less of the project area is covered with brush and is removed as part of site preparation (mobile emissions estimated at .09 metric tonnes CO2e per acre, biological emissions estimated at .5 metric tonnes per acre).	
					None - No site preparation is conducted.	
0	67	1	247	5	None	0
15	71	2	260	6	None	0
30	74	2	272	7	None	0
45	77	2	284	8	None	0
60	81	2	297	9	None	0
75	84	3	309	9	None	0
90	88	3	321	10	None	0
105	91	3	334	11	None	0
0	0	0	0	0	None	0
	Difference between ending stocks and beginning stocks		87	5.63	Sum of emissions (Metric Tonnes CO2e) per acre	0

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT
21, 316
PART OF PLAN
1/10/2021

Project Carbon Accounting: Harvesting Emissions

This worksheet addresses the non-biological emissions associated with the project area's harvesting activities. Complete the input for Steps 9- 14 on this worksheet.

Harvest Periods	Falling Operations	Production per Day	Emissions Associated with Yarders and Loaders			Emissions Associated with Tractors and Skidders			Emissions Associated with Helicopters			Landing Saws	Trucking Emissions	
from Inventory, Growth, and Harvest Page (Time of Harvest as years from project approval)	Assumption: ((.25 gallons gasoline per MBF harvested * 5.33 (pounds carbon per gallon))/2205(conversion to metric tonnes)* mbf per acre harvested	MBF (all species) Yarded Delivered to Landing	Assumption:(((35 gallons diesel per day per piece of equipment * 6.12 pounds carbon / gallon)/2205 to convert to metric tonnes carbon)* 3.67 to convert to metric tonnes CO2 equivalent)/Production per Day			Assumption: (((55 gallons diesel per day per piece of equipment * 6.12 pounds carbon / gallon)/2205 to convert to metric tonnes carbon)* 3.67 to convert to metric tonnes CO2 equivalent)/Production per Day			Assumption: (((200 gallons jet fuel per day per piece of equipment * 5 pounds carbon / gallon)/2205 to convert to metric tonnes carbon)* 3.67 to convert to metric tonnes CO2 equivalent)/Production per Day			Assumption: (((.16 gallons gasoline per MBF * 5.33 (pounds carbon per gallon))/2205(conversion to metric tonnes)* 3.67 to convert to metric tonnes CO2 equivalent)/mbf per acre harvested. Applies to all species whether harvested or not.	Assumption: Round Trip Hours/Load average (from below, to compute the mbf/hour) /((6 gallons diesel/hour * 6.12 pounds carbon/gallon)/2205 (conversion to metric tonnes carbon))*3.67 (conversion to metric tonnes carbon dioxide equivalent)	
	Computed. Metric Tonnes CO2 equivalent per mbf harvested Applies to all species whether harvested or treated	Step 9. Enter the estimated volume delivered to the landing in a day.	Step 10. Enter number of pieces of equipment in use per day for each harvest entry	Computed. Yarders and Loaders CO2 equivalent/mbf (metric tonnes)	Computed. Yarders and Loaders CO2 equivalent per Acre Harvested (metric tonnes)	Step 11. Enter number of pieces of equipment in use per day for each harvest entry	Computed. Tractor and skidder CO2 equivalent/mbf (metric tonnes)	Computed. Tractors and Skidders CO2 equivalent per Acre Harvested (metric tonnes)	Step 12. Enter number of pieces of equipment in use per day for each harvest entry	Computed. Helicopter CO2 equivalent/mbf (metric tonnes)	Computed. Helicopters CO2 equivalent per Acre Harvested (metric tonnes)	Computed. Landing Saws CO2 equivalent per Acre Harvested (metric tonnes)	Steps 13 and 14 below	Computed. Estimated Metric Tonnes CO2e per harvested acre for each harvesting period.
0	(0.03)	45	1	-0.01	-0.10	3	-0.04	-0.49	0	0.00	0.00	-0.02	Step 13. Enter Estimated Load Average: MBF/Truck: 6	-0.259787755
15	(0.03)	45	1	-0.01	-0.10	3	-0.04	-0.49	0	0.00	0.00	-0.02		-0.259787755
30	(0.03)	45	1	-0.01	-0.10	3	-0.04	-0.49	0	0.00	0.00	-0.02		-0.259787755
45	(0.03)	45	1	-0.01	-0.10	3	-0.04	-0.49	0	0.00	0.00	-0.02	Step 14. Enter Estimated Round Trip Haul in Hours: 6	-0.259787755
60	(0.03)	45	1	-0.01	-0.10	3	-0.04	-0.49	0	0.00	0.00	-0.02		-0.259787755
75	(0.03)	45	1	-0.01	-0.10	3	-0.04	-0.49	0	0.00	0.00	-0.02		-0.259787755
90	(0.03)	45	1	-0.01	-0.10	3	-0.04	-0.49	0	0.00	0.00	-0.02		-0.259787755
105	(0.03)	45	1	-0.01	-0.10	3	-0.04	-0.49	0	0.00	0.00	-0.02		-0.259787755
0	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00		0
0	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00		0
Sum Emissions	-0.23				-0.82			-3.88			0.00	-0.15		-2.08

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

221.31c

1/10/2021

Project Carbon Accounting: Harvested Wood Products and Processing Emissions

This worksheet addresses the non-biological emissions associated with the project area's harvesting activities. Complete the input for Steps 15- 16 on this worksheet.

Harvest Periods	Quantity of Forest Carbon Delivered to Mills				Non-Biological Emissions Associated with Mills	Quantity of Forest Carbon Remaining Immediately After Milling (Mill Efficiency)		Long-Term Sequestration in Wood Products	
	Conifer Percentage Delivered to Mills	Hardwood Percentage Delivered to Mills	Conifer CO2e Delivered to Mills / Acre	Hardwood CO2 equivalent Delivered to Mills / Acre	**Assumption.** 20 kw/hour (mill energy use) /(40mbf lumber processed/hour) *(.05 metric tonnes/kw hour) * mbf processed	**Computed.** Remaining CO2 equivalent after Milling Efficiency for Conifers	**Computed.** Remaining CO2 equivalent after Milling Efficiency for Hardwoods	**Computed.** CO2 Equivalent Tonnes in Conifer Wood Products in Use-100 Year Weighted Average / Acre and Landfill	**Computed.** CO2 Equivalent Tonnes in Hardwood Wood Products in Use-100 Year Weighted Average / Acre
from Inventory, Growth, and Harvest Page (Time of Harvest as years from project approval)	**Step 15.** Insert the percentage of conifer trees harvested that are subsequently delivered to sawmills	**Step 16.** Insert the percentage of hardwoods harvested or treated that are subsequently delivered to sawmills	**Computed:** The merchantable portion determined by the conversion factors (Sampson, 2002) on the Inventory, Growth, and Harvest worksheet. This is multiplied by the percent delivered to mills to reflect the carbon delivered to mills.	**Computed:** The merchantable portion determined by the conversion factors (Sampson, 2002) on the Inventory, Growth, and Harvest worksheet. This is multiplied by the percent delivered to mills to reflect the carbon delivered to mills.	**Calculated.** **The CO2e associated with processing the logs at the mill**	The difference between carbon delivered to mills and carbon remaining after milling is assumed to be emitted immediately		**Estimate.** The weighted average carbon remaining in use at year 100 is 46.3%	**Estimate.** The weighted average carbon remaining in use at year 100 is 23.0%
						The efficiency rating from mills in California is 0.67 (DOE 1605b) for conifers	The efficiency rating from mills in California is .5 (DOE 1605b) for hardwoods	**Estimate.** The carbon in landfills at year 100 is 29.8% of the initial carbon produced in wood products.	**Estimate.** The carbon in landfills at year 100 is 29.8% of the initial carbon produced in wood products.
0	100%	0%	47.97	0.00	-0.33	32.14	0.00	24.46	0.00
15	100%	0%	47.97	0.00	-0.33	32.14	0.00	24.46	0.00
30	100%	0%	47.97	0.00	-0.33	32.14	0.00	24.46	0.00
45	100%	0%	47.97	0.00	-0.33	32.14	0.00	24.46	0.00
60	100%	0%	47.97	0.00	-0.33	32.14	0.00	24.46	0.00
75	100%	0%	47.97	0.00	-0.33	32.14	0.00	24.46	0.00
90	100%	0%	47.97	0.00	-0.33	32.14	0.00	24.46	0.00
105	100%	0%	47.97	0.00	-0.33	32.14	0.00	24.46	0.00
0	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Sum of emissions associate with processing of lumber			-2.60	Sum of CO2 equivalent in wood products		146.74	0.00

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

221.31d

1/10/2021

Years	Conifer												Hardwood												Total					
	Starting Inventory (MBF/Acre)	Starting Inventory (CO2-e Tonnes/Acre)	Harvest (MBF/Acre)	Annual Inventory Estimate (MBF/acre)	Estimated CO2 equivalent in Inventory (Metric Tonnes/A	Estimated CO2 equivalent harvested in total tree	Portion of Harvest Delivered to Mill	Amount CO2 equivalent transferred to the mill (bole portion	In Use Decay Curve of Wood Products (Conifer) (%)	CO2 -e in in-use harvested wood products (Metric Tonnes/Acre)	Fraction of CO2 equivalent remaining in landfills (%)	CO2 -e in Landfills (Metric Tonnes/Acre)	Combined CO2-e in Landfills and In-use (Metric	Starting Inventory (BA/Acre)	Starting Inventory CO2-e (Metric Tonnes/Acre)	Harvest (BA/Acre)	Annual Inventory (BA/acre)	Estimated CO2 equivalent in Inventory (Metric Tonnes/A	Estimated CO2 equivalent harvested in total tree	Portion of Harvest Delivered to Mill (%)	Amount CO2 equivalent transferred to the mill (bole portion	In Use Decay Curve of Wood Products (Conifer) (Metric Tonnes/A	CO2 -e in in-use harvested wood products (Metric Tonnes/Acre)	Fraction of CO2 equivalent remaining in landfills (%)	CO2 -e in Landfills (Metric Tonnes/Acre)	Combined CO2-e in Landfills and In-use (Metric	CO2-e in Standing Inventories (Metric Tonnes/A cre)	CO2-e in Harvested Wood Products (Metric Tonnes/Acre)	CO2-e in Inventories and in Harvested Wood Products (Metric	Initial CO2-e in Forest	Years in Which Project Sequestration Exceed Initial CO2-e	Number of Years for Growth and Harvested Wood Products
Pre-harvest	40	247	13	27	167	80	100%	48	0.66	32	0.02	0.86	33.24	10	5	-	10	5	-	0%	-	0.57	-	-	-	176.87	33.24	205	253	101	9
1			-	26	173	-		-	0.64	31	0.04	1.68	32.23			-	10	5	-		-	0.53	-	0.02	-	-	183.15	32.23	211		101	
2			-	29	179	-		-	0.60	29	0.05	2.45	31.32			-	10	5	-		-	0.49	-	0.03	-	-	189.43	31.32	216		101	
3			-	30	185	-		-	0.57	27	0.07	3.21	30.65			-	10	6	-		-	0.46	-	0.05	-	-	195.71	30.65	222		101	
4			-	31	192	-		-	0.55	26	0.08	3.89	30.03			-	10	6	-		-	0.44	-	0.06	-	-	201.99	30.03	227		101	
5			-	32	198	-		-	0.52	25	0.09	4.51	29.50			-	11	6	-		-	0.41	-	0.07	-	-	208.27	29.50	233		101	
6			-	33	204	-		-	0.50	24	0.11	5.13	29.02			-	11	6	-		-	0.39	-	0.08	-	-	214.55	29.02	239		101	
7			-	34	210	-		-	0.48	23	0.12	5.71	28.64			-	11	6	-		-	0.37	-	0.09	-	-	220.83	28.64	245		101	
8			-	35	216	-		-	0.46	22	0.13	6.24	28.20			-	11	6	-		-	0.35	-	0.10	-	-	227.11	28.20	250		101	
9			-	36	222	-		-	0.44	21	0.14	6.76	27.87			-	11	6	-		-	0.33	-	0.11	-	-	233.39	27.87	256		9	
10			-	37	229	-		-	0.42	20	0.15	7.24	27.58			-	11	6	-		-	0.32	-	0.12	-	-	239.87	27.58	262		10	
11			-	38	235	-		-	0.41	20	0.16	7.72	27.46			-	11	6	-		-	0.32	-	0.12	-	-	245.96	27.46	268		11	
12			-	39	241	-		-	0.40	19	0.17	8.15	27.32			-	11	6	-		-	0.32	-	0.12	-	-	252.24	27.32	274		12	
13			-	40	247	-		-	0.39	19	0.18	8.54	27.12			-	11	6	-		-	0.32	-	0.12	-	-	258.52	27.12	280		13	
14			-	41	253	-		-	0.38	18	0.19	8.97	26.97			-	11	6	-		-	0.32	-	0.12	-	-	264.80	26.97	286		14	
15			13	29	179	80		48	0.36	50	0.19	10.17	59.96			-	12	6	-		-	0.26	-	0.14	-	-	190.73	59.96	245		101	
16			-	30	185	-		-	0.36	48	0.20	11.37	58.95			-	12	6	-		-	0.26	-	0.14	-	-	197.01	58.95	251		101	
17			-	31	192	-		-	0.35	46	0.21	12.47	57.99			-	12	6	-		-	0.26	-	0.14	-	-	203.29	57.99	256		17	
18			-	32	198	-		-	0.34	44	0.22	13.53	57.22			-	12	6	-		-	0.26	-	0.14	-	-	209.57	57.22	261		18	
19			-	33	204	-		-	0.33	42	0.22	14.53	56.55			-	12	6	-		-	0.26	-	0.14	-	-	215.85	56.55	267		19	
20			-	34	210	-		-	0.32	40	0.23	15.45	55.93			-	12	6	-		-	0.22	-	0.16	-	-	222.13	55.93	273		20	
21			-	35	216	-		-	0.32	39	0.23	16.36	55.44			-	12	6	-		-	0.22	-	0.16	-	-	228.41	55.44	278		21	
22			-	36	222	-		-	0.31	38	0.24	17.17	55.00			-	12	7	-		-	0.22	-	0.16	-	-	234.69	55.00	284		22	
23			-	37	229	-		-	0.30	37	0.25	17.99	54.56			-	12	7	-		-	0.22	-	0.16	-	-	240.97	54.56	290		23	
24			-	38	235	-		-	0.30	35	0.25	18.76	54.16			-	12	7	-		-	0.22	-	0.16	-	-	247.26	54.16	296		24	
25			-	39	241	-		-	0.29	34	0.26	19.47	53.82			-	13	7	-		-	0.19	-	0.17	-	-	253.54	53.82	302		25	
26			-	40	247	-		-	0.29	34	0.26	20.15	53.66			-	13	7	-		-	0.19	-	0.17	-	-	259.82	53.66	308		26	
27			-	41	253	-		-	0.28	33	0.26	20.82	53.49			-	13	7	-		-	0.19	-	0.17	-	-	266.10	53.49	314		27	
28			-	42	260	-		-	0.28	32	0.27	21.39	53.23			-	13	7	-		-	0.19	-	0.17	-	-	272.38	53.23	320		28	
29			-	43	266	-		-	0.27	31	0.27	22.02	53.02			-	13	7	-		-	0.19	-	0.17	-	-	278.66	53.02	326		29	
30			13	31	192	80		48	0.27	63	0.28	23.41	85.96			-	13	7	-		-	0.17	-	0.18	-	-	204.59	85.96	285		30	
31			-	32	198	-		-	0.26	60	0.28	24.80	84.94			-	13	7	-		-	0.17	-	0.18	-	-	210.87	84.94	290		31	
32			-	33	204	-		-	0.26	58	0.28	26.09	83.97			-	13	7	-		-	0.17	-	0.18	-	-	217.15	83.97	295		32	
33			-	34	210	-		-	0.25	56	0.29	27.29	83.15			-	13	7	-		-	0.17	-	0.18	-	-	223.43	83.15	300		33	
34			-	35	216	-		-	0.25	54	0.29	28.49	82.47			-	13	7	-		-	0.17	-	0.18	-	-	229.71	82.47	306		34	
35			-	36	222	-		-	0.25	52	0.29	29.55	81.78			-	14	7	-		-	0.15	-	0.19	-	-	235.99	81.78	312		35	
36			-	37	229	-		-	0.24	51	0.30	30.65	81.30			-	14	7	-		-	0.15	-	0.19	-	-	242.27	81.30	317		36	
37			-	38	235	-		-	0.24	49	0.30	31.61	80.82			-	14	7	-		-	0.15	-	0.19	-	-	248.56	80.82	323		37	
38			-	39	241	-		-	0.23	48	0.30	32.57	80.35			-	14	7	-		-	0.15	-	0.19	-	-	254.84	80.35	329		38	
39			-	40	247	-		-	0.23	46	0.31	33.48	79.91			-	14	7	-		-	0.15	-	0.19	-	-	261.12	79.91	335		39	
40			-	41	253	-		-	0.23	45	0.31	34.34	79.53			-	14	8	-		-	0.13	-	0.19	-	-	267.40	79.53	340		40	
41			-	42	260	-		-	0.22	44	0.31	35.11	79.31			-	14	8	-		-	0.13	-	0.19	-	-	273.68	79.31	346		41	
42			-	43	266	-		-	0.22	43	0.32	35.93	79.14			-	14	8	-		-	0.13	-	0.19	-	-	279.96	79.14	353		42	
43			-	44	272	-		-	0.22	42	0.32	36.65	78.87			-	14	8	-		-	0.13	-	0.19	-	-	286.24	78.87	358		43	
44			-	45	278	-		-	0.21	41	0.32	37.37	78.60			-	14	8	-		-	0.13	-	0.19	-	-	292.52	78.60	364		44	
45			13	33	204	80		48	0.21	73	0.32	38.90	111.52			-	15	8	-		-	0.12	-	0.20	-	-	218.45	111.52	323		45	
46			-	34	210	-		-	0.21	70	0.33	40.39	110.47			-	15	8	-		-	0.12	-	0.20	-	-	224.73	110.47	328		46	
47			-	35	216	-		-	0.20	68	0.33	41.83	109.51			-	15	8	-		-	0.12	-	0.20	-	-	231.01	109.51	334		47	
48			-	36	222	-		-	0.20	66	0.33	43.12	108.65			-	15	8	-		-	0.12	-	0.20	-	-	237.29	108.65	339		48	
49			-	37	229	-		-	0.20	64	0.33	44.42	107.93			-	15	8	-		-	0.12	-	0.20	-	-	243.57	107.93	345		49	
50			-	38	235	-		-	0.20	62	0.33	45.47	107.11			-	15	8	-		-	0.11	-	0.20	-	-	249.86	107.11	350		50	
51			-	39	241	-		-	0.19	60	0.33	46.58	106.52			-	15	8	-		-	0.11	-	0.20	-	-	256.14	106.52	356		51	
52			-	40	247	-		-	0.19	58	0.33	47.54	105.92			-	15	8	-		-	0.11	-	0.20	-	-	262.42	105.92	361		52	
53			-	41	253	-		-	0.19	57	0.33	48.49	105.33			-	15	8	-		-	0.11	-	0.20	-	-	268.70	105.33	367		53	
54			-	42	260	-		-	0.19	55	0.34	49.93	105.31			-	15	8	-		-	0.11	-	0.20	-	-	274.98	105.31	373		54	
55			-	43	266	-		-	0.18	54	0.34	50.80	104.81			-	16	8	-		-	0.10	-	0.20	-	-	281.26	104.81	379		55	
56			-	44	272	-		-	0.18	53	0.34	51.56	104.48			-	16	8	-		-	0.10	-	0.20	-	-	287.54	104.48	385		56	
57			-	45	278	-		-	0.18	52	0.34	52.38	104.20			-	16	8	-		-	0.10	-	0.20	-	-	293.82	104.20	391		57	
58			-	46	284	-		-	0.18	51	0.34	53.10	103.83			-	16	8	-		-	0.10	-	0.20	-	-	300.10	103.83	397		58	
59			-	47	290	-		-	0.18	50	0.35	54.30	103.94			-	16	9	-		-	0.10	-	0.20	-	-	306.38	103.94	403		59	
60			13	35	216	80		48	0.17	81	0.35	55.83	136.75			-	16	9	-		-	0.09	-	0.21	-	-	232.31	136.75	362		60	
61			-	36	222	-		-	0.17	78	0.35	57.32	135.59			-	16	9	-		-	0.09	-	0.21	-	-	238.59	135.59	367		61	
62			-	37	229	-		-	0.17	76	0.35	58.76	134.53			-	16	9	-		-	0.09	-	0.21	-	-	244.87	134.53	372		62	
63			-	38	235	-		-	0.17	74	0.35	60.06	133.56			-	16	9	-		-	0.09	-	0.21	-	-	251.16	133.56	377		63	
64			-	39	241	-		-	0.16	71	0.36	61.73	133.12			-	16	9	-		-	0.09	-	0.21	-	-	257.44	133.12	383		64	
65			-	40	247	-		-	0.16	69	0.36	62.79	132.20			-	17	9	-		-	0.08	-	0.21	-	-	263.72	132.20	388		65	
66			-	41	253	-		-	0.16	68	0.36	63.89	131.52			-	17	9	-		-	0.08	-	0.21	-	-	270.00	131.52	394		66	
67			-	42	260	-		-	0.16	66	0.36	64.85	130.84			-	17	9	-		-	0.08	-	0.21	-	-	276.28	130.84	399		67	
68			-	43	266	-		-	0.16	64	0.36	65.81	130.15			-	17	9	-		-	0.08	-	0.21	-	-	282.56	130.15	405		68	
69			-	44	272	-		-	0.15	63	0.37	67.63	130.43			-	17	9	-		-	0.08	-	0.21	-	-	288.84	130.43	411		69	
70			-	45	278	-		-	0.15	61	0.37	68.50	129.85			-	17	9	-		-	0.07	-	0.21	-	-	295.12	129.85	417		70	
71			-	46	284	-		-	0.15	60	0.37	69.26	129.44			-	17	9	-		-	0.07	-	0.21	-	-	301.40	129.44	423		71	
72			-	47	290	-		-	0.15	59	0.37	70.08	129.09			-	17	9	-		-	0.07	-	0.21	-	-	307.68	129.09	429		72	
73			-	48	297	-		-	0.15	58	0.37	70.80	128.64			-	17	9	-		-	0.07	-	0.21	-	-	313.96	128.64	435		73	

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

221,31e

1/10/2021

Years	Conifer												Hardwood												Total					
	Starting Inventory (MBF/Acre)	Starting Inventory (CO2-e Tonnes/Acre)	Harvest (MBF/Acre)	Annual Inventory Estimate (MBF/acre)	Estimated CO2 equivalent in Inventory (Metric Tonnes/A	Estimated CO2 equivalent harvested in total tree	Portion of Harvest Delivered to Mill	Amount CO2 equivalent transferred to the mill (bole portion	In Use Decay Curve of Wood Products (Conifer) (%)	CO2 -e in in-use harvested wood products (Metric Tonnes/Acre)	Fraction of CO2 equivalent remaining in landfills (%)	CO2 -e in Landfills (Metric Tonnes/Acre)	Combined CO2-e in Landfills and In-use (Metric	Starting Inventory (BA/Acre)	Starting Inventory CO2-e (Metric Tonnes/Acre)	Harvest (BA/Acre)	Annual Inventory (BA/acre)	Estimated CO2 equivalent in Inventory (Metric Tonnes/A	Estimated CO2 equivalent harvested in total tree	Portion of Harvest Delivered to Mill (%)	Amount CO2 equivalent transferred to the mill (bole portion	In Use Decay Curve of Wood Products (Conifer) (Metric Tonnes/A	CO2 -e in in-use harvested wood products (Metric Tonnes/Acre)	Fraction of CO2 equivalent remaining in landfills (%)	CO2 -e in Landfills (Metric Tonnes/Acre)	Combined CO2-e in Landfills and In-use (Metric	CO2-e in Standing Inventories (Metric Tonnes/Acre)	CO2-e in Harvested Wood Products (Metric Tonnes/Acre)	CO2-e in Inventories and in Harvested Wood Products (Metric	Initial CO2-e in Forest	Years in Which Project Sequestration Exceed Initial CO2-e	Number of Years for Growth and Harvested Wood Products
74			-	49	303	-		-	0.15	57	0.38	72.33	129.00			-	17	9	-		-	0.07	-	0.21	-	-	320.24	129.00	441		74	
75			13	37	229	80		48	0.15	88	0.38	73.67	161.75			-	18	9	-		-	0.07	-	0.21	-	-	246.17	161.75	400		75	
76			-	38	235	-		-	0.14	85	0.38	75.36	160.51			-	18	9	-		-	0.07	-	0.21	-	-	252.46	160.51	405		76	
77			-	39	241	-		-	0.14	83	0.38	76.80	159.37			-	18	9	-		-	0.07	-	0.21	-	-	258.74	159.37	410		77	
78			-	40	247	-		-	0.14	80	0.38	78.09	158.33			-	18	10	-		-	0.07	-	0.21	-	-	265.02	158.33	415		78	
79			-	41	253	-		-	0.14	78	0.38	80.06	158.10			-	18	10	-		-	0.07	-	0.21	-	-	271.30	158.10	421		79	
80			-	42	260	-		-	0.14	76	0.38	81.11	157.09			-	18	10	-		-	0.06	-	0.21	-	-	277.58	157.09	426		80	
81			-	43	266	-		-	0.14	74	0.38	82.22	156.34			-	18	10	-		-	0.06	-	0.21	-	-	283.88	156.34	432		81	
82			-	44	272	-		-	0.13	72	0.38	83.18	155.60			-	18	10	-		-	0.06	-	0.21	-	-	290.14	155.60	437		82	
83			-	45	278	-		-	0.13	71	0.38	84.13	154.85			-	18	10	-		-	0.06	-	0.21	-	-	296.42	154.85	443		83	
84			-	46	284	-		-	0.13	69	0.39	86.29	155.39			-	18	10	-		-	0.06	-	0.21	-	-	302.70	155.39	450		84	
85			-	47	290	-		-	0.13	68	0.39	87.16	154.74			-	19	10	-		-	0.06	-	0.22	-	-	308.98	154.74	456		85	
86			-	48	297	-		-	0.13	66	0.39	87.92	154.28			-	19	10	-		-	0.06	-	0.22	-	-	315.26	154.28	461		86	
87			-	49	303	-		-	0.13	65	0.39	88.74	153.87			-	19	10	-		-	0.06	-	0.22	-	-	321.54	153.87	467		87	
88			-	50	309	-		-	0.13	64	0.39	89.46	153.36			-	19	10	-		-	0.06	-	0.22	-	-	327.82	153.36	472		88	
89			-	51	315	-		-	0.13	63	0.40	91.28	153.96			-	19	10	-		-	0.06	-	0.22	-	-	334.10	153.96	479		89	
90			13	39	241	80		48	0.12	94	0.40	92.82	186.64			-	19	10	-		-	0.05	-	0.22	-	-	260.04	186.64	438		90	
91			-	40	247	-		-	0.12	91	0.40	94.30	185.34			-	19	10	-		-	0.05	-	0.22	-	-	266.32	185.34	443		91	
92			-	41	253	-		-	0.12	88	0.40	95.74	184.13			-	19	10	-		-	0.05	-	0.22	-	-	272.60	184.13	448		92	
93			-	42	260	-		-	0.12	86	0.40	97.04	183.02			-	19	10	-		-	0.05	-	0.22	-	-	278.88	183.02	453		93	
94			-	43	266	-		-	0.12	84	0.40	99.24	182.97			-	19	10	-		-	0.05	-	0.22	-	-	285.16	182.97	459		94	
95			-	44	272	-		-	0.12	82	0.40	100.30	181.89			-	20	10	-		-	0.05	-	0.22	-	-	291.44	181.89	464		95	
96			-	45	278	-		-	0.12	80	0.40	101.40	181.10			-	20	11	-		-	0.05	-	0.22	-	-	297.72	181.10	470		96	
97			-	46	284	-		-	0.12	78	0.40	102.36	180.30			-	20	11	-		-	0.05	-	0.22	-	-	304.00	180.30	475		97	
98			-	47	290	-		-	0.11	76	0.40	103.32	179.50			-	20	11	-		-	0.05	-	0.22	-	-	310.28	179.50	481		98	
99			-	48	297	-		-	0.11	75	0.41	105.72	180.24			-	20	11	-		-	0.05	-	0.22	-	-	316.56	180.24	488		99	
100			-	49	303	-		-	0.11	73	0.41	106.58	179.54			-	20	11	-		-	0.05	-	0.22	-	-	322.84	179.54	493		100	
																										-	-				

221,314

PART OF PLAN

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

1/10/2021

RECEIVED
APR 2 8 2021
COAST AREA
RESOURCE MANAGEMENT

I. Wildfire Risk and Assessment

1. Fire hazard severity zoning – The following Public Resources Codes directs the State for determining areas of financial responsibility in preventing and suppressing fires and the classification of fire hazard severity of those lands.

> **4125.** (a) The board shall classify all lands within the state, without regard to any classification of lands made by or for any federal agency or purpose, for the purpose of determining areas in which the financial responsibility of preventing and suppressing fires is primarily the responsibility of the state. The prevention and suppression of fires in all areas that are not so classified is primarily the responsibility of local or federal agencies, as the case may be.
>
> **4201.** The purpose of this article is to provide for the classification of lands within state responsibility areas in accordance with the severity of fire hazard present for the purpose of identifying measures to be taken to retard the rate of spreading and to reduce the potential intensity of uncontrolled fires that threaten to destroy resources, life, or property.
>
> **4202.** The director shall classify lands within state responsibility areas into fire hazard severity zones. Each zone shall embrace relatively homogeneous lands and shall be based on fuel loading, slope, fire weather, and other relevant factors present, including areas where winds have been identified by the department as a major cause of wildfire spread.
>
> **4203.** (a) The director shall, by regulation, designate fire hazard severity zones and assign to each zone a rating reflecting the degree of severity of fire hazard that is expected to prevail in the zone.

Wildland fire hazard responsibility areas of the State are generally classified as state, local or federal. The plan area lies within a State Responsibility Area (SRA). Referencing the CAL FIRE Forest and Resource Assessment Program map titled Mendocino County FIRE HAZARD SEVERITY ZONES IN SRA, the plan area is located in a High Severity zone.

The Mendocino County General Plan 2009 was also reviewed. County mapping of fire hazard severity defers to CAL FIREs maps particularly in the wildland and wildland urban interface areas. The County identifies the plan area located within the High Severity zone of the SRA. The Gualala and Anchor Bay areas are served by the South Coast Fire Protection District and CALFIRE which has a Fire Station at the south end of Sea Ranch on Annapolis Road.

2. Existing and probable future fuel conditions including vertical and horizontal continuity of live and dead fuels - Hazardous fuels are live and dead vegetation that has accumulated and can increase the likelihood of unusually large wildland fires. When fire encounters areas of heavy fuel loads (continuous brush, downed vegetation or small trees) it can burn these surface and ladder fuels and may quickly move from a ground fire into a crown fire in the event of severe fire weather (low humidity and high winds).

The plan area is a dominated by the redwood and Douglas-fir forest type and is located approximately 2 miles from the ocean so is affected by maritime climate. The timbered portion on the plan area is a closed canopy, open understory, well stocked redwood dominated stand with an estimated 10% herbaceous layer. The existing fuel condition within the plan area includes both vertical and horizontal continuity of live fuels. The vegetative community and the stand type, composition and density are described in Section III of the plan, Project Description. Also contained within the Section III, Project Description, is regional information (i.e., topography, aspect, climate regime) which provide background and insight for the assessment of wildfire risk.

Through management of the stand, postharvest fuel conditions will be modified. The Selection harvest method will significantly reduce the amount of ladder fuels. In many cases overly dense, poor health and poor form trees are harvested to release the dominant and codominant conifers and promote natural regeneration. The selective removal of trees will result in crown separation reducing vertical and horizontal continuity within the stand. The retention of healthy conifers will improve the overall stand health

PART OF PLAN

PART OF PLAN

provide for a more fire-resistant stand.

Landing sites are prone to slash accumulation and piles can be significant. The plan provides for piling and burning for hazard reduction at landings. Current practice observed is for skidding equipment to take landing slash and spread it back out to throughout the forest off the existing skid trail system. Near the landings this material may be spread out and packed into skid trails. This practice reduces the vertical continuity of ground fuel and provides for erosion control beyond those areas within the plan where treatment is required by the Rules. Although the plan is not a fuel hazard reduction project, operations associated with the majority of this THP will have an on the ground result similar to a shaded fuel break. Where a Fire Protection Zones exists, slash treatment is addressed in Section II of the plan.

3. Location of known existing public and private fuel breaks and fuel hazard reduction activities – Fuel breaks are wide strips of land where trees and vegetation have been reduced or removed. These areas can slow, and even stop, the spread of a wildland fire because they provide fewer fuels to carry the fire. They also provide firefighters with safe zones to take a stand against a wildfire, use the break as a line to back burn from, or retreat to from fire and use as an escape route or in some cases a safety zone if the need arises. Typically, fuel breaks are located in strategic locations based upon topography, existing roads, community areas, and other key access points where they provide the most protection or allow firefighters to use as a defensive position to fight fire from. Fuel hazard reduction is generally the reduction of surface and ladder fuels and the overstory and understory vegetation is spatially separated so that a ground fire will not, under normal fire conditions, climb into the canopy and turn into a crown fire. This can be achieved by thinning out dense tree stands and preserving mature sized trees that are retained to shade out brush that grows in after thinning.

Within and adjacent to the plan area there are no known designated public or private fuelbreaks. There are no known CAL FIRE fuel treatment program projects adjacent to the plan area. The Sea Ranch Community Wildfire Protection Plan (CWPP) has been developed. General fuel reduction treatment goals and areas identified by The Sea Ranch CWPP address among other things, roadside fuel breaks and defensible space for structures. The Sea Ranch is a mile to the southwest from this plan area.

Timber harvesting maintains, reuses, and creates skid trails, landings, and truck roads whose presence by definition is a fuel break. The Gualala river and the riparian area and gravel bars of the River and the main tributaries act as natural fuel breaks. Fuel hazard reduction and slash treatment, where the condition or location exists, is addressed in Section II of the plan. In this plan, slash will not be generated near roads used by the public or near structures used for human occupation which would require slash treatment. During logging operations there is generally equipment on site that would be suitable for the construction of fuel breaks or to support CAL FIRE in fire suppression activities. LTOs are required to follow fire safe procedures, possess and maintain fire suppression equipment, and report any fires to CAL FIRE that they cannot immediately control. The GRT RPF who is responsible for providing advice for the THP will have the LTO fill out a Fire Suppression Resource Inventory of equipment at the start of operations to ensure the LTO possesses the required firefighting equipment, and ensure the LTO posts the required notices regarding smoking and matches, and lunch and warming fires. The LTO shall inspect the THP area within two hours after operations have ceased during the dry period when fire is likely to spread as per 14 CCR 918.8.

4. Road access for fire suppression resources- In the event of a wildfire on the THP or GRT property, CAL FIRE will respond and there is a CALFIRE fire station at The Sea Ranch is approximately 7 air miles from the plan area and 11-12 miles by road. Access to the plan area is gained from the paved County Road 501. The majority of appurtenant roads within the plan area are existing permanent rocked roads. Gates are generally left open during the day while active logging operations are occurring which would allow access for fire suppression resources. Gate openings can accommodate over-sized loads such as water tenders and equipment transport trailers.

Finding: The potential for significant forest fuel loading that could exacerbate wildfires will not be created within the plan area, and the LTO will be required to follow all fire precaution measures to avoid a wildfire. Other operations on the GRT property will follow similar requirements. The proposed project will not add to

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

a cumulative increase in wildfire risk and hazard.

PART OF PLAN

Sources Of Information:

The following sources of information or persons were consulted for preparation of the Cumulative Impact Assessment.

A. **Watershed Resources:**

Thalweg profile analysis, Gualala river watershed assessment & cooperative monitoring program (O'Connor and Rosser 2006)

GRWC Monitoring Plan Report 2000-2005, Kathleen Morgan 2006

Gualala River Watershed Technical Support Document by North Coast Regional Water Quality Control Board, 2001

Gualala River Watershed Assessment Report. North Coast Watershed Assessment Program, Klamt, Robert R.C. LeDoux-Bloom, J. Clements, M. Fuller, D. Morse, and M. Scruggs (multidisciplinary team leads). 2002. Appendices. California Resources Agency, and California Environmental Protection Agency, Sacramento, California.

A Study Evaluating the Effectiveness of Riparian Buffers in Minimizing Impacts of Clearcut Timber Harvest Operations on Shade-Producing Canopy Cover, Microclimate, and Water Temperature along a Headwater Stream in Northern California, Cajun Elaine James 2003

Dawson, T. E. 1996. The use of fog precipitation by plants in coastal redwood forests. Pages 90-93 in J. LeBlanc, editor. Proceedings of the conference on coast redwood forest ecology and management. University of California, Cooperative Extension, Forestry.

Lewis, J., S. Mori, E. Keppeler, and R. Ziemer. 2001. Impacts of logging on storm peak flows, flow volumes and suspended sediment loads in Caspar Creek, California. Pages 85-125 in: M. S. Wigmosta and Steven J. Burges editors. Land Use and Watersheds: Human Influence on Hydrology and Geomorphology in Urban and Forest Areas. Water Science and Application Volume 2, American Geophysical Union, Washington, D.C.

Regional Assessment of Stream Temperatures Across Northern California and their Relationship to Various Landscape-Level and Site Specific Attributes, Lewis et al. 2000, Forest Science Project, HSUF Arcata, CA

Gualala River Watershed Literature Search And Assimilation By Patrick Higgins 791 Eighth Street, Suite N, Arcata, CA 95521 707-822-9428

California Dept. Of Fish And Game, Stream Report Archives, Yountville, CA

Gualala Redwood Timber LLC Stream Reports For The Years 1995 To 2017

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

Geo Hazard Maps Created By Tim Best, C.E.G.

USGS 7.5 min map McGuire Ridge

Aerial Photographs- NAIP imagery

Lidar imagery of the Gualala River

Google Earth

PART OF PLAN

B. **Soil Productivity:**
GRT's geographic information system maps

Soil Veg Maps- Dave Devries at Mesa Technical 2630 Hilgard Berkeley, CA 94709

Soil descriptions from the Soil Conservation Service

C. **Biological Resources:**
Sources Of Information:

U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California Red-legged Frog (Rana aurora draytonii). U.S. Fish and Wildlife Service, Portland, Oregon. viii + 173 pp.

California Red Legged Frog Movement and Habitat Use , Dr. Gary Fellers, Western Ecology Research Center, July 2007

CNPS web site 2018

California Natural Diversity Data Base, April 2018.

Raptors of California, Hans and Pam Peeters, 2005 University of California Press

The Audubon Society Field Guide to North American Bird, John Whitaker, Alfred Knopf Inc 1992

The Audubon Society Field Guide to North American Bird, Bebler and King, Alfred Knopf Inc 1992

California Mammals, E.W. Jameson and Hans Peeters, University of California Press, Berkeley, 1988.

California's Wildlife, Vol. I - Amphibians and Reptiles, California Statewide Wildlife Habitat Relationships System, May 2, 1988.
California's Wildlife, Vol. II - Birds, California Statewide Wildlife Habitat Relationships System, November, 1990.
California's Wildlife, Vol. III - Mammals, California Statewide Wildlife Habitat Relationships System, April, 1990.
CWHRS Townsends Big Eared Bat J. Harris updated 2000

RECEIVED
MAR 16 2021
COAST AREA OFFICE
RESOURCE MANAGEMENT

MRC THP 1-14-148men for info on Fog Drip and COTO

Petition to List COTO Center for Biological Diversity 2013

Field Guide to the Birds of North America, National Geographic Society, 1987.

Scats and Tracks of the Pacific Coast, James Halfpenny, 1999 Falcon Publish

The Jepson Manual: Higher Plants of California, James C. Hickman, editor. University of California Press, Berkeley, 1993.

FRAP Multi-source Land Cover Data v02_2 (FVEG02_2, 2002)

CA Resources Agency Ownership Data (GOVLANDS, July 2002)

NCWAP North Coast Watershed Assessment Program, March 2003

Gualala Redwoods Inc. Stream Reports For The Years 1995 To 2017

Gualala River Watershed Technical Support Document by North Coast Regional Water Quality Control Board 2001

TMDL by the EPA 2002

GRI Westside THP Fisheries Report by Dennis Halligan NRM 1434 Third St. Eureka, CA 95501

Gualala River Watershed Literature Search And Assimilation By Patrick Higgins 791 Eighth Street, Suite N, Arcata, CA 95521 707-822-9428

Pam Town, Biologist, Deary, Idaho

California's Wildlife Volume I, II and III, Published by CDFG, April 1990

Gualala Redwoods Database On Fish Habitat- Gualala CA

GRT property wide Rare Plant Assessment by Clare Golec, updated 2001

Nest Site Selection And Breeding Status Of Ospreys In The Gualala Redwoods, HJW

Wildlife Species With Special Status That May Be Present On Gualala Redwoods Or Other HJW Managed Properties By Lawrence Kobernus 1995 Updated By Troy Leopardo 1999

CDF Guidelines For Species Surveys. RPF Mass Mailing July 1999

RECEIVED
APR 28 2021
COAST AREA
RESOURCE MANAGEMENT

PART OF PLAN

Northwest Weeds, Ronald Taylor, Mountain Press Publishing 1990

Pacific Coast Berry Finder, Gleen Keator, Natural Study Guild 1978

D. Recreation Assessment:

Gualala Redwood Timber GIS

E. Visual Assessment:

Gualala Redwood Timber GIS

F. Traffic Assessment:

Gualala Redwood Timber GIS

G. Noise Assessment:

Gualala Redwood Timber GIS

H. Global Warming:

See section H. above for references.

I. Wildfire Risk and Assessment:

CAL FIRE, Fire Hazard Severity Zones in SRA (map), Adopted November 7, 2007

The County of Mendocino General Plan, August 2009 (https://www.mendocinocounty.org/government/planning-building-services/plans/mendocino-county-general-plan)

FireSafe Sonoma, Sonoma County CWPP, Appendix E: The Sea Ranch CWPP (2010) (https://www.firesafesonoma.org/documents/)

Additional Persons contacted for information on cumulative impacts analysis-

John Bennett- forester for GRT

Charll Stoneman- forester for GRT

RECEIVED
APR 28 2021
COAST AREA
RESOURCE MANAGEMENT

PART OF PLAN