

**OFFICIAL RESPONSE TO SIGNIFICANT ENVIRONMENTAL
POINTS RAISED DURING THE TIMBER HARVESTING PLAN
EVALUATION PROCESS**

**FROM THE DIRECTOR OF THE CALIFORNIA DEPARTMENT OF
FORESTRY AND FIRE PROTECTION (CAL FIRE)**

TIMBER HARVESTING PLAN (THP) No:	1-20-00150 MEN
SUBMITTER:	Gualala Redwood Timber LLC
COUNTY:	Mendocino
END OF PUBLIC COMMENT PERIOD:	January 05, 2021
DATE OF RESPONSE AND APPROVAL:	February 25, 2021

The California Department of Forestry and Fire Protection (CAL FIRE) serves as the lead agency in the review of Timber Harvesting Plans. These plans are submitted to CAL FIRE, which directs a multidisciplinary review team of specialists from other governmental agencies to ensure compliance with environmental laws and regulations. As a part of this review process, CAL FIRE accepted and responded to comments, which addressed significant environmental points raised during the evaluation of the plan referenced above. This document is the Director's official response to those significant environmental points, which specifically address this Timber Harvesting Plan. Comments, which were made on like topics, have been grouped together and addressed in a single response. Remarks concerning the validity of the review process for timber operations, questions of law, or topics and concerns so remote or speculative that they could not be reasonably assessed or related to the outcome of a timber harvesting operation, have not been addressed.

Sincerely,



James Strong
Forester II, Forest Practice
RPF #2689



cc: RPF, Unit, File; Timber Owner, Timberland Owner and/or Submitter
CP, CDFW, DPR, & RWB (through <https://caltreesplans.resources.ca.gov/caltrees/caltrees.aspx>)

PUBLIC NOTIFICATION

To inform the public of this proposed Timber Harvesting Plan (THP) and determine if there were any concerns with the plan the following actions were taken:

- Notification of the receipt of a timber harvesting plan was sent to the adjacent landowner(s).
- Notice of the receipt of the plan was submitted to the county clerk for posting with other environmental notices.
- Notice of the plan was posted at the Department's local office and also at the regional office in Santa Rosa.
- Notice of the receipt of the THP was sent to those organizations and individuals on the Department's list for notification of plans in the county.
- A "Notice of the Intent to Harvest Timber" was posted near the plan site.

THP REVIEW PROCESS

The laws and regulations that govern the Timber Harvesting Plan review process are found in Statute law in the form of the Forest Practice Act which is contained in the Public Resources Code (PRC) and Administrative law in the rules of the Board of Forestry and Fire Protection (the Forest Practice Rules) which are contained in the California Code of Regulations (CCR).

The Forest Practice Rules are lengthy in scope and detail and provide explicit instructions for permissible and prohibited actions that govern the conduct of timber operations in the field. The major categories covered by the rules include:

- Timber Harvesting Plan contents and the Timber Harvesting Plan review process
- Silvicultural methods
- Harvesting practices and erosion control
- Site preparation
- Watercourse and lake protection
- Hazard reduction
- Fire protection
- Forest insect and disease protection practices
- Coastal Commission Special Treatment Areas
- Use, construction and maintenance of logging roads and landings
- County-specific rules

When a THP is submitted to the Department, it undergoes a multidisciplinary review consisting of several steps. In addition to CAL FIRE, the Review Team members include representatives of the California Department of Fish and Wildlife (CDFW); the appropriate Regional Water Quality Control Board (RWQCB or RWB); California Geological Survey (CGS); the Department of Parks and Recreation (DPR); the appropriate County Planning office; and if within their jurisdiction, the Coastal Commission (CC) (14 CCR §1037.5(a)). Once submitted the Director determines if the plan is accurate, complete, and in proper

order, and if so, files the Plan (14 CCR §1037). In addition, the Review Team determines whether a Pre-Harvest Inspection (PHI) is necessary, and what areas of concern are to be examined during the inspection (14 CCR §1037.5(g)(1)).

If the plan is accepted for filing, and a PHI is determined to be needed, a field review is conducted to evaluate the adequacy of the THP. All agency personnel who comprise the multidisciplinary Review Team are invited to attend the PHI as well as other experts and agency personnel whom the Department may request. During this field review, additional mitigation and/or recommendations may be formulated to provide greater environmental protection. These recommendations are forwarded to the RPF along with the Review Team member's PHI Report. The RPF will respond to the recommendations made and forward these to the Region office and Second Review Team Chair.

A Second Review Team meeting is held where members of the multidisciplinary Review Team meet to review all the information in the plan and develop a recommendation for the Director (14 CCR §1037.5(g)(2)). Prior to and/or during this meeting they examine all field inspection reports, consider comments raised by the public, and discuss any additional recommendations or changes needed relative to the proposed THP. These recommendations are forwarded to the RPF. If there are additional recommendations, the RPF will respond to each recommendation, and forward his responses to the regional office in Santa Rosa.

The representative of the Director of the Department reviews all documents associated with the proposed THP, including all mitigation measures and plan provisions, written correspondence from the public and other reviewing agencies, recommendations of the multidisciplinary Review Team, and the RPF's responses to questions and recommendations made during the review period. Following consideration of this material, a decision is made to approve or deny a THP.

If a THP is approved, logging may commence. The THP is valid for up to five years and may be extended under special circumstances for a maximum of two more years, for a total of seven years.

Prior to commencing logging operations, the Registered Professional Forester must meet with the licensed timber operator (LTO) to discuss the THP (CCR §1035.2); a CAL FIRE representative may attend this meeting. The Department makes periodic field inspections to check for THP and rule compliance. The number of inspections depends upon the plan size, duration, complexity, and the potential for adverse impacts. Inspections include but are not limited to inspections during operations pursuant to Public Resources Code (PRC) section 4604, inspections of completed work pursuant to PRC section 4586, erosion control monitoring as per PRC section 4585(a), and stocking inspection as per PRC section 4588.

The contents of the THP, the Forest Practice Act, and rules, provide the criteria which CAL FIRE inspectors use to determine compliance. While the Department cannot guarantee that there will be no violations, it is the Department's policy to vigorously pursue the prompt and positive enforcement of the Forest Practice Act, the Forest Practice Rules, related laws

and regulations, and environmental protection measures that apply to timber operations on non-federal land in California. This enforcement is directed primarily at preventing forest practice violations, and secondarily at prompt and adequate correction of violations when they occur.

The general means of enforcement of the Forest Practice Act, the rules, and other related regulations range from the use of violation notices, which require corrective action, to criminal proceedings through the court system. Timber operator and Registered Professional Forester licensing action may also be pursued. Most forest practice violations are correctable and the Department's enforcement program assures correction. Where non-correctable violations occur, criminal action is usually taken. Depending on the outcome of the case and the court in which the case is heard, some sort of environmental corrective work is usually done. This is intended to offset non-correctable adverse impacts.

Once harvesting operations are finished, a completion report must be submitted certifying that the area meets the requirements of the rules. CAL FIRE inspects the area to verify that all aspects of the applicable rules and regulations have been followed, including erosion control work. Depending on the silvicultural system used, the stocking standards of the rules must be met immediately or in certain cases within five years. A stocking report must be filed to certify that the requirements have been met.

ACRONYM AND ABBREVIATION DEFINITIONS

AB47	Assembly Bill 47 requiring maps of past, present, and future harvesting projects for cumulative impacts	GRT	Gualala Redwood Timber LLC
BAA	Biological Assessment Area	LTO	Licensed Timber Operator
BMP	Best Management Practices	MSP	Maximum Sustained Production (of High Quality Timber Products)
CCC	California Coastal Commission	NSO	Northern Spotted Owl
CAL FIRE / CDF	California Department of Forestry & Fire Protection	NTMP	Nonindustrial Timber Management Plan
CalTREES	California Timber Regulation Environmental Evaluation System	OR	Official Response
CCR	California Code of Regulations	PC	Public Comment
CDFW	California Department of Fish and Wildlife	PHI	Pre-Harvest Inspection
CEQA	California Environmental Quality Act	PRC	Public Resources Code
CESA	California Endangered Species Act	RPF	Registered Professional Forester
CGS	California Geological Survey	RWQCB (RWB)	Regional Water Quality Control Board
CWPP	Community Wildfire Protection Plan	MEN	Mendocino County
CNDDDB	California Natural Diversity Database	THP	Timber Harvesting Plan
DDD	Director's Decision Date	TPZ	Timberland Production Zone
EIR	Environmental Impact Report	USFS	United States Forest Service
EPA	Environmental Protection Agency	WLPZ	Watercourse and Lake Protection Zone
FPRs	Forest Practice Rules	WAA	Watershed Assessment Area
GIS	Geographic Information System	§	Section

GRT	Gualala Redwood Timber		
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[sic] Word used verbatim as originally printed in another document. May indicate a typo, misspelling or incorrect word usage.

BACKGROUND

Timber Harvesting Plan (THP) # 1-20-00150-MEN "Far North 2020" proposes to harvest timber on 227 acres of GRT timberland using the Clearcutting, Seed Tree Removal Step, Shelterwood Removal Step, Group Selection, and Transition silvicultural methods. The THP was received by CAL FIRE on September 03, 2020, accepted for filing on September 10, 2020, and a Preharvest Inspection (PHI) was conducted on October 15, 2020. Attendees on the PHI included Lee Susan the RPF, Carey Wilder from RWQCB, Ben Harris the CAL FIRE Archeologist, and Kenneth Margiott the CAL FIRE Inspector. The Final Interagency Review (aka Second Review) occurred on December 03, 2020. The Second Review Chair requested minor clarifications during the meeting. The RPF responded to those recommendations, and on December 26, 2020, the Second Review Chair accepted the revisions and recommended the Plan for approval. The public comment period then ended on January 5, 2021. The deadline for the Director's Determination Deadline (DDD) was set for January 26, 2021 per 14 CCR § 1037.4.

PUBLIC COMMENT SUMMARY

During the public comment period for this THP as described above, there was 1 public comment letter received at the CAL FIRE Region Headquarters in Santa Rosa. This public comment brought up concerns that are addressed in this Official Response (OR). A copy of the original letter sent to the Department is viewable through the Department's online Forest Practice Database CalTREES.

CalTREES instructions: Navigate to <https://caltreesplans.resources.ca.gov/caltrees/caltrees.aspx>. Click the search icon at the top of the page, then type the THP# in the Document Number box (county identifier not needed). Select "Timber Harvest Plan" under the Document Type dropdown menu and hit the Search button. The bottom portion of the resulting webpage will contain all documents associated with the THP's plan record in electronic format. The Public Comments are categorized under "Record Type".

SUMMARY OF GENERAL CONCERNS WITH RESPONSES

1. **CONCERN: High Erosion Hazard Rating (EHR) adds to cumulative impacts on listed species.** This concern was from the introductory paragraph. The THP's EHR has broken down the plan area by soil type. There are 11 soil types in the plan area. 8 have a moderate EHR rating and three have a high EHR rating. The three that are high,

are all due to the steepness of the slopes. The High EHR rating is on a relatively small percentage of the THP area and the appropriate rules have been followed regarding EHR rating. Additionally, the FPRs require numerous mitigations when the EHR is high. For instance, waterbar spacing gets closer (page 21), road building restrictions and yarding restrictions (page 28) become enforceable parts of the plan. Therefore, the EHR rating of high will not have a cumulative impact on listed species.

2. **CONCERN: High EHR will add impacts to protected flood plain areas.** This concern was from the introductory paragraph. Flood prone areas were excluded from this THP (page 131). The small percentage of area that has a high EHR rating, primarily due to slope, will not add to impacts on flood prone areas, as they are not on or near the flood prone areas. Please see response to **Concern 1** regarding mitigations within the FPRs for high EHR. Since flood prone areas are excluded from this THP, it can reasonably be expected that high EHR will not have an impact on flood prone areas.
3. **CONCERN: Cumulative impacts of this plan will combine with impacts of other plans.** This concern was from the introductory paragraph. The cumulative impacts on this plan have been mitigated to a level that is less than significant as described in section IV of the THP. The plan has thoroughly assessed past, present and future plans in the cumulative impact assessment area. Starting on page 141 through 143 the plan discloses the surrounding plans in the assessment area for the past 10 years, and these surrounding plans have similarly all been assessed as being mitigated to a level that is less than significant.
4. **CONCERN: This THP does not minimize logging and road related disturbances.** This concern was from the introductory paragraph. One of the primary goals and objectives of this plan is to minimize logging and road related disturbances. See section II, Item 18, beginning on page 22 through Item 30, beginning on page 59. These items largely deal with the primary goal and objective of minimizing logging and road related disturbances. Starting on page 71 of the THP, 70 road points have been assessed by a multi-disciplinary review team, many in the field on PHI, with most requiring no treatment. It can be reasonably concluded that logging and road related disturbances have been mitigated to a level that is less than significant.
5. **CONCERN: The plan does not comply with 2009 ASP rules.** This concern was from the introductory paragraph. This plan conforms with the Forest Practice Rules regarding watersheds with listed salmonids; see Item 26, Section III, starting on page 131 and Item 26, Section II, starting on page 44.
6. **CONCERN: The plan should comply with the whitepaper “flood prone area considerations”.** This concern was from the introductory paragraph. Flood prone

areas were excluded from this THP. See page 131, Section III. This plan, to be approved, must comply with the FPRs, as well as being scrutinized by multi-disciplinary review team, including the Department of Fish and Wildlife who participated with the review of this THP. This process is largely outlined at the beginning of this OR. This plan complies with FPRs and can reasonably be expected not to impact flood plains.

7. CONCERN: Faulty Sediment Impacts Analysis

RESPONSE: A study done by Kamman Hydrology & Engineering was attached to the public comment. The subject line is titled, Estimated Roadway Sediment Yields, Far North THP: 1-20-00150 MEN, Mendocino County, California. Two additional studies, similar in nature were also provided in the public comment. These studies are done by the same company, Kamman, Hydrology & Engineering. These studies were done for two other THPs, 1-18-098-MEN and 1-18-095-MEN. The study appears to be an analysis of the quantity of sediment that logging roads and skid trails will produce regardless of connectivity.

In conducting his analysis, Mr. Kamman did not conduct a field visit of the THP area, but submitted the analysis based on remote sensing information.

On February 16, 2021, the RPF provided additional information to the plan record to support the sedimentation analysis included in the THP. The additional information was a memorandum from Mr. Danny Hagans, Principal Earth Scientist from Pacific Watershed Associates to John Bennett, Forest Manager at Gualala Redwood Timber Inc.

Per page 4 of the memorandum, Mr. Hagans is the author of the document that is referenced by Mr. Kamman in his analysis. Page 5 of the memorandum from Mr. Hagans states that:

Making desktop assumptions about the percentage of the road that is hydrologically connected (e.g., 100% or 50% as was done by Kamman) is potentially fraught with error and will lead to erroneous estimates of sediment delivery from the road network being discussed, especially where those road systems have already been effectively treated with state grant funding for hydrological disconnection.

In fact, the above described 45-mile 2002 road erosion and connectivity assessment within the LNFR watershed only identified 17 miles of road (or 38%) as being hydrologically connected, based on direct field observations and measurements. That means the other 62% of the road network was not hydrologically connected or delivering eroded fine sediment to the stream system on an annual basis even before the roads were treated with CDFG monies...

Finally, Kamman (paragraph 2 on page 1 in each of their three November 20, 2020 reports submitted to CAL FIRE in response to the 3 GRT THP's (Far North, Little and Elk)) suggests there are many other unquantified potential sediment sources, such as gullying, landslides and stream crossing failures that will contribute to additional sediment cumulative effects in the Planning Watershed. This conclusion is inaccurate and unrealistic as the 2003 CDFG grant funded and approved watershed restoration and erosion prevention work resulted in over 150 stream crossings that were: 1) reconstructed with properly sized culverts or armored fills designed to accommodate the 100-year return runoff event, installed at grade with stable fillslopes and critical dips to prevent stream diversion and gully formation; or 2) the stream crossings were properly decommissioned per the guidelines provided in the Handbook for Forest, Ranch and Rural Roads (Weaver, Weppner and Hagans, 2015). In addition, the 2003 watershed-wide storm-proofing work included the excavation and preventive stabilization of a minimum of 51 potential road-related unstable fillslopes that PWA had identified as exhibiting a potential for failure and sediment delivery to nearby streams.

In Mr. Hagans conclusion, he states the following (page 5 of the memorandum):

The conditions and assumptions included in the Kamman reports are not consistent with those found on the ground in these areas.

Section II, Item 18, starting on page 22 of the THP outlines in detail the different mitigations measures for soil stabilization and erosion control. This includes guidance for hydraulic disconnection of roads and treatments for soil surface protection by applications of mulch and seed on bare ground.

Section II, Items 19 – 27 of the Plan starting on page 28, include substantial and highly regulated requirements for timber operations to protect against potential erosion. Some of these include the winter operations restrictions, heavy equipment limitations, road use management, and watercourse protection measures.

During the Preharvest inspection, neither the CAL FIRE inspector, nor any other attending agency representative expressed concern for any unmitigated erosion potential. This plan complies with 14 CCR 923.1(e) and it can be reasonably concluded that the measures in this THP have mitigated sediment impacts to a level that is less than significant.

8. CONCERN: Inadequacy of the Erosion Control Plan and Cumulative Impact Assessment of Sediment.

RESPONSE: The commenter alleges the ECP of the plan to be inadequate and that, if the plan is approved, will lead to “inevitable additive cumulative impacts from sediment

pollution...” The ECP for this plan is in Section V from pages 258 to 270 and includes 11 road points as well as an order of treatment. The ECP is complete.

Regarding the Cumulative Impacts Assessment of Sediment, per 14 CCR § 912.9, the Board of Forestry and Fire Protection Technical Rule Addendum No. 2 Cumulative Impacts Assessment outlines in detail the requirements and discussion points to be addressed for analysis. The introduction of this addendum in the Forest Practice Act describes the rule as follows:

The purpose of this addendum is to provide a framework for the assessment of Cumulative Impacts as required in 14 CCR § 898 that may occur as a result of proposed Timber Operations. Cumulative Impacts, pursuant to 14 CCR § 15355, refers to two or more individual Effects which, when considered together, are considerable or which compound or increase other environmental Impacts. This assessment shall include evaluation of both on-site and off-site interactions of proposed project activities with the Impacts of Past Projects and Reasonably Foreseeable Probable Future Projects.

Resource subjects to be considered in the assessment of Cumulative Impacts are listed in 14 CCR § 912.9(c) and described in greater detail in the Appendix to this Addendum. In conducting an assessment, the RPF must distinguish between the potential on-site Impacts of the Plan's proposed activities (which may not be significant when considered alone) with Impacts of Timber Operations and Reasonably Foreseeable Future Projects pursuant to 14 CCR § 15130(b)(1)(A).

The past and present projects analysis is conducted within the watershed assessment area (WAA), generally the intersecting State Planning Watersheds (version 2.2). The THP falls within one planning watershed which make up the WAA as listed in the THP on page 3 (Doty Creek #1113.810003). The Past and Present projects tables correctly list the harvest plans in the WAA during the last 10 years as required. In Section IV, starting on page 140 of the THP summarizes the harvest history activity as follows:

The Watershed Assessment Area consisting of the Doty Creek CALWATER Watersheds is 4,628 acres in size, with Gualala Redwood Timber LLC being the majority landowner in the watershed.

A total of approximately 655 acres of the 4,628 acres within the Watershed Assessment Area (WAA) (approximately 14%) will have had harvest documents (includes NTMP's) approved in the past 10 years.

Most effects from timber harvest are apparent within the first few years and then taper off as revegetation occurs. Any effects from timber harvest are also ameliorated if some form of partial harvest / cable logging is employed. The THP area makes up a small portion of the assessment areas, which are the Doty Creek planning watersheds. The mitigations, as proposed in this THP and the improvements that have been made outside

of the THP in the watersheds, shall reduce impacts of the proposed THP to insignificance.

Section IV of the THP starting on page 140 outlines and documents the Past, Present, and Future projects in the WAA along with discussions for the remaining resource subjects listed under Technical Rule Addendum No 2. These include evaluating the Watershed, Soil Productivity, Biological (flora and fauna species), Recreation, Visual, Traffic, Greenhouse Gases, and Wildfire Risk Hazard.

The review of the significance of cumulative impacts is further described under CEQA section 21082.2:

(a) The lead agency shall determine whether a project may have a significant effect on the environment based on substantial evidence in light of the whole record.

(b) The existence of public controversy over the environmental effects of a project shall not require preparation of an environmental impact report if there is no substantial evidence in light of the whole record before the lead agency that the project may have a significant effect on the environment.

(c) Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly inaccurate or erroneous, or evidence of social or economic impacts which do not contribute to, or are not caused by, physical impacts on the environment, is not substantial evidence. Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.

There were no concerns brought up by the CAL FIRE field inspector nor any other agency review member for issues with the analysis and conclusions of the Cumulative Impacts of the THP. The Department agrees with the summaries presented in Section IV of the THP that proposed timber operations will not cause or add to significant adverse Cumulative Impacts. These impacts by itself or in combination with other Projects and listed resource subjects have been reduced to insignificance or avoided by mitigation measures or alternatives proposed in the Plan and application of the Rules. The following was concluded on page 13 of the PHI report, regarding cumulative impacts:

Impacts to soil resources will not be significant. The proposed road and landing construction will be offset by cable yarding steep slopes above watercourses that were previously logged with ground-based equipment. Ground based yarding operations will be limited to well designated skid trail system that will not have a significant impact on soil resources or the residual timberstands or conifer regeneration.

Gualala Redwood Timber has bene involved in extensive road and watercourse crossing work that has significantly reduced sediment delivery into the Gualala River Watershed. This THP includes additional measures to remove potential sediment sources from watercourses. GRT has been involved with LWD

recruitment projects including the Doty Creek watershed and other sub watersheds in the North Fork of the Gualala River.

On February 16, 2021, the RPF provided additional information to the plan record to support the sedimentation analysis included in the THP. The additional information was a memorandum from Mr. Danny Hagans, Principal Earth Scientist from Pacific Watershed Associates to John Bennett, Forest Manager at Gualala Redwood Timber Inc. This plan complies with the FPRs and it can be reasonably concluded that the ECP and cumulative impact analysis on this THP have mitigated impacts to a level that is less than significant.

9. CONCERN: GRT's objective of making a profit cause them to pursue bad management practices.

The commenter asserts that because GRT seeks to make a profit, this inherently leads them to practice inferior silviculture and yarding practices. The commenter provided no examples, and the concern is speculative in nature. This plan complies with the FPRs and it can be reasonably concluded that the measures in this THP have mitigated impacts to a level that is less than significant.

10. CONCERN: Cable yarding is less impactful than Tractor yarding and this plan does not distinguish between the two.

The plan distinguishes between what will be cable yarded and what will be tractor yarded on page 92 of Section II of the THP. The plan appropriately assigns steeper slopes to the cable yarding method and gentler slopes to the tractor yarding method. Cable yarding gentle slopes is not recommended except for unusual situations. Cable yarding on gentle slopes would generally be more impactful than tractor yarding gentler slopes. The tractor yarding proposed in this THP is appropriate, has been evaluated by the Review Team, and conforms with the FPRs.

11. CONCERN: Visual Resource Impacts

RESPONSE: The description of the Visual Resources Assessment area and impacts for Far North 2020 THP (1-20-00150 MEN) are discussed in Section IV as required by 14 CCR § 912.9 Technical Rule Addendum No. 2 Cumulative Impacts Assessment, starting on page 150 in the THP under "assessment area for visual resources".

The assessment area for visual resources includes all of the area within a 0.7 mile radius of the plan area. The rationale for this particular size and shape is as follows:

1. *This area was chosen for consistency and as an area where potential adverse effects to visual resources might occur.*
2. *This area includes nearly all of the possible vantage points from which this THP area could be seen."*

This assessment area is sufficiently large to capture the outer range of viewing points and the potential impact the proposed project may have on visual values. As stated in the assessment on page 199:

The harvest area will be visible to motorists traveling on Fish Rock Road and Old Stage Road. Harvest unit "A" is adjacent to Old Stage Road for approximately 1200 feet and will be visible to motorists traveling on this road. Harvest unit "E" is adjacent to Fish Rock Road for approximately 2600 feet and will be visible to motorists traveling on this road. Adjoining areas have been similarly harvested in the past and the planned harvest will be less intense than most as viewed from public roadways itemized above. Harvesting in units A and E are limited to a selective cut. Slash reduction measures within 100 feet of public roads is required as specified in Section 2 of the THP. Adjoining areas have been similarly harvested in the past and no significant change in the visual resource was noted.

The commenter is under the incorrect assumption that group selection is even aged management, so it should be noted that group selection is not 'even aged', it is 'uneven aged' management. Canopy thinning may be noticeable, but the area will still be well forested since only 35 acres of the 227-acre THP is being proposed for clear-cut. Preharvest canopy closure levels will likely be met within 10-15 years. Given the silviculture method proposed for the plan there will be no significant visual change to the timbered hillslopes, river corridor, or timbered skyline. As noted on page 13, item 76, of the PHI report, "visual impacts will not be significant since the timber stands adjacent to public roads are selection silviculture which will leave the timber stand in well forested condition." There will be no immediate significant adverse impact or cumulative long-term effects relating to visual resources with the operation of this harvest plan.

12. CONCERN: Delineation of Flood Prone Areas

Flood prone areas are clearly defined in the Forest Practice Rules 14 CCR 895.1 definitions. Flood prone areas were excluded from this THP. See page 131, Section III. Regarding flood prone areas. see responses above to concerns 2, 4, 6 and 8. WLPZ and watercourse protections were evaluated on the PHI and determined be appropriate. The multi-agency review team has found the flood prone areas to be properly disclosed and delineated and therefore any impacts can reasonably be assumed to have been mitigated for.

REFERENCES

CEQA Portal Topic Paper. *Definition of Project Under CEQA*. Available on 12/29/2020 at <https://ceqaportal.org/tp/Project%20Description%2003-23-16.pdf>

2020 California Environmental Quality Act. *Statue and Guidelines*. Available on 12/15/2020 at https://www.califaep.org/docs/2020_ceqa_book.pdf

2020 California Forest Practice Rules and Forest Practice Act. Available on 12/1/2020 at <https://bof.fire.ca.gov/regulations/bills-statutes-rules-and-annual-california-forest-practice-rules/>

SUMMARY

The preharvest inspection held on October 1, 2020 concluded that the Plan was found to be in conformance after the successful completion of the agreed upon recommendations, which were incorporated into the Plan prior to approval.

The Second Review meeting held on December 3, 2020 concluded that the THP needed additional clarifications before it could be found to be in conformance with the Act and the Rules of the Board of Forestry and Fire Protection. It was recommended for approval on December 26, 2020 after minor clarifications were accepted and incorporated into the Plan prior to approval.

The Department has reviewed the concerns brought up through the public comment process and has replied to them by this Official Response. This process has not demonstrated any new significant points that would warrant a recirculation of the Plan pursuant to 14 CCR § 1037.3(e), or a recommendation of nonconformance pursuant to 14 CCR § 1054. The THP states in Section I, under Item 13(b) "After considering the rules of the Board of Forestry and Fire Protection and the mitigation measures incorporated in this THP, I (the RPF) have determined that the timber operation will not have a significant adverse impact on the environment". The Department finds that the RPF has sufficiently documented that there shall be no unmitigated significant impacts to the identified resources under this THP.

It is the Department's determination that this THP, as proposed, is in compliance with the FPRs and has been through a detailed multi-agency review process. The discussion points and mitigation measures included in the THP have been found to be appropriate to address the concerns brought up by the public comment process. The conclusions reached by the Department and the other state resource agencies are based on decades of professional experience associated with the review of similar harvest plans.

THE PUBLIC COMMENT IN ITS ENTIRETY IS BELOW.

20PC-0000000582 – from Chris Poehlmann on December 12, 2020 with attachment from Kamman Hydrology & Engineering, Inc.

Please respond to and place these comments from Friends of Gualala River in the comment file of the 1-20-00150-MEN "Far North" THP.

Re:

- 1.) Faulty Sediment Impacts Analysis**
- 2.) Inadequacy of the Cumulative Effects Analysis**
- 3.) Delineation of Flood Prone Area**
- 4.) Visual Resources Impacts**

Introduction:

These are submitted comments that point to the need for denial of this 227 acre THP as submitted due to its cumulative impacts and other issues outlined below. This THP, with its moderate to high EHRs, will add its cumulative harvest related impacts on listed species and to the protected floodplain areas with their crucial role in restoration of listed aquatic and non-aquatic species. These cumulative impacts will be added to all the floodplain/Doty Creek Planning Watershed logging plans that are from the past, present, or foreseeable in the future. These THPs include the 1-18-095 MEN "Little", 1-19-00098 MEN "Elk", and 1-15-042 SON "Dogwood". The nearby and downstream "Dogwood" THP is the largest ever and most extensive riparian logging proposal on the Gualala River since the Forest Practice Rules were adopted in 1973.

The Far North THP does not minimize logging and road related disturbances and sediment delivery to flood prone areas. The plan should be denied and resubmitted until it complies with the full intent and provisions of the 2009 Anadromous Salmonid Protection Rules (ASP rules) and with a design incorporating the findings of the white paper titled "Flood Prone Area Considerations in the Coast Redwood Zone, 2005".

Steelhead and coho are struggling and failing to recover in the Gualala River during the current historic drought. Their potential habitat is negatively impacted from impending cumulative impacts of the approved "Dogwood" THP's 5 miles of unprecedented riparian forest logging along with the completed "Plum" and "Kestrel" THPs and now with those from the proposed "Elk" and "Little" along with upslope impacts from plans like 1-19-00197-MEN "Hoodoo" THP on the North Fork and Robinson Creek watersheds.

Faulty Sediment Impacts Analysis

Pertinent is an important statistic from Page 2 of the NCRWCB PHI report in the nearby Elk THP:

"The sediment source analysis concluded that approximately 1/3 of sediment

delivery in the Gualala River watershed was due to natural processes and 2/3 of sediment delivery, or 200% of the natural load, due to anthropogenic sources, primarily related to roads and harvest related mass wasting."

A proper and complete analysis of the potential release of sediment from road related and other sources from this Far North THP should be submitted and made part of and inform the Erosion Control Plan that will be ultimately submitted to the NCRWQCB for enrollment in a General WDR. In the absence of any effort by the RFP to assess and quantify all of the THP's sediment sources, especially ongoing and future sediment erosion from road surfaces within and appurtenant to the THP, FOGP has retained Hydrologist and Professional Geologist Greg Kamman, PG, CHG, to prepare an estimate of sediment volume from the THP's existing and proposed road surfaces.

Mr. Kamman's analysis indicates that the road surfaces associated with the THP alone are and will contribute a significant quantity of sediment to the Little North Fork of the Gualala River. He estimates the THP's road surfaces will release 804 tons/mi²/year of sediment to the Little North Fork and downstream waters. This level of sediment grossly exceeds the allocation for road and skid trail surfaces identified by the U.S Environmental Protection Agency in adopting the Gualala River Total Maximum Daily Load for Sediment ("TMDL") as well as the North Coast Regional Water Quality Control Board's Gualala River Watershed Technical Support Document.

According to EPA's adopted TMDL, the sedimentation rate from road surfaces and skid trails must be reduced to 12 tons/mi²/year throughout the Gualala River watershed in order to restore the river's ongoing cumulative degradation from sediment. Because Mr. Kamman's substantial evidence that the Far North THP's erosion rate from road surfaces is more than 6,600 percent in excess of EPA's allocation, the Far North THP and its roads are clearly contributing significantly to the watershed's ongoing sediment degradation. Mr. Kamman also estimates the cumulative sediment rates from two other THPs proposed by GRT, - THP 1-19-00098 MEN (Elk) and THP 1-18-095 MEN (Little). He estimates that the road surfaces and skid trails encompassed by the three proposed THPs are and will cumulatively discharge 1,176 tons/mi²/yr. The THP fails to address these conspicuous sediment sources and their failure to come close to abiding by the sediment load allocations necessary to bring the watershed into compliance with the applicable Basin Plan standards.

Mr. Kamman's review with the incorporated analyses is attached to this email and is requested to be put in the CalFire public comment file for the 1-20-150 MEN "Far North" THP.

Inadequacy of the Cumulative Effects Analysis

Sediment

Mr. Kamman's analysis regarding sediment points to major flaws in the THP's analysis of potential cumulative effects from this plan added to those past, present

and future THPs in the Doty Creek planning watershed that contains the Little THP and Elk THP in addition to impacts from the adjacent planning watersheds that drain to the North Fork of the Gualala River.

It is clear from the FPRs that the correctly calculated levels of potential sediment yields must align themselves with and reflect all applicable water quality requirements.

One of those FPR requirements is clearly the compliance required to an existing TMDL. 916.9 (a)(1)(emphasis added)

916.9 (FPRs)

“(a) Goal - Every timber operation shall be planned and conducted to protect, maintain, and contribute to restoration of properly functioning salmonid habitat and listed salmonid species. To achieve this goal, every timber operation shall be planned and conducted to:

(1) Comply with the terms of a **Total Maximum Daily Load (TMDL)**.

(2) Prevent significant sediment load increase to a watercourse system or lake.

(3) Prevent significant instability of a watercourse channel or of a watercourse or lake bank.

(4) Prevent significant blockage of any aquatic migratory routes for any life stage of anadromous salmonids or listed species.

(5) Prevent significant adverse effects to streamflow.

(6) Consistent with the requirements of 14 CCR § 916.9 [936.9, 956.9], subsections (f), (g), (h) and (v), protect, maintain, and restore trees (especially conifers), snags, or downed large woody debris that currently, or may in the foreseeable future, provide large woody debris recruitment needed for instream habitat structure and fluvial geomorphic functions.

(7) Consistent with the requirements of 14 CCR § 916.9 [936.9, 956.9], subsections (f), (g), (h) and (v), protect, maintain, and restore the quality and quantity of vegetative canopy needed to:

(A) provide shade to the watercourse or lake to maintain daily and seasonal water temperatures within the preferred range for anadromous salmonids or listed species where they are present or could be restored; and

(B) provide a deciduous vegetation component to the riparian zone for aquatic...”

A plan’s analysis of how potential erosion is estimated and dealt with is contained in the plan’s Erosion Control Plan (ECP). According to the FPRs, the contents of an ECP must include: “a. An inventory of all controllable sediment discharge sources within the Project area...”

The inadequacy of the ECP and the projected sediment impacts presented in the Far North THP application would, if this plan is approved, lead to inevitable additive cumulative impacts from sediment pollution along with those of harvest plans past, present and future. The impacts from these elevated levels of sediment delivery will be significant along with the impacts of the Dogwood THP, and past, present, and future THPs and the background levels already present in the watershed. These elevated levels are the very ones that have informed the RB’s formulation of recommended levels of maximum daily loads incorporated into the Gualala River

TMDL.

In the Cumulative Impact Assessment/Section IV of the Elk THP, (1-19-00098-MEN, another THP in Far North's planning watershed), are assertions that GRT is exercising light touch forestry. The submitter is apparently equating the restoration forestry being practiced by GRT to be similar to harvesting practices pointed to by the GRT RPF being used by NGO's such as The Sempervirens Fund's (TSF). The selective harvesting scope in the Sempervirens conservation plan is pointed out and that this level of selection cutting will continue "only with great care, under strict sustainability standards- to generate money for ongoing management and restoration of the property."

Setting aside that the principal intent of GRT is profit from its operations, closer investigation reveals the fact that the harvesting methods proposed by the TSF are significantly different and superior to those in this GRT plan and their other sensitive plans proposed for old growth harvesting in the floodplain and near floodplain areas. The Far North THP proposes five different silvicultural prescriptions. Although it breaks with the tradition of GRT not utilizing cable yarding, it still incorporates impactful even-age management on 98 of the 227 total acres of this THP. Upon inspection of the files for the first THP that was filed for the TSF's "Living Landscape Plan" for the San Vicente Redwoods (1-14-117-SCR "San Vicente" THP), it can be seen, for example, that there are similar Erosion Hazard Ratings in the Far North THP and "San Vicente" THPs. The TSF plan responds in part to these potential sources of sedimentation and mass wasting by incorporating extensive cable yarding as a harvesting technique to be employed even though they

have Class II and Class III timberland represented and not the even more sensitive Class I lands found in and adjacent to the "Elk", "Far North" and other GRT floodplain plans. Cable yarding is a more costly technique to use, but if sensitive areas are in play, whether they are flood plains, steep slopes or erosive soils and terrains, the appropriate use of cable yarding is by far the best choice to minimize potential impacts. The proportion of logging done with true cable yarding versus the amount of "Tractor Long Line" logging noted is not described. This is a failure of the THP to properly describe the nature, extent, and cumulative impacts of the proposed harvesting methods.

The Sempervirens Fund plan proposes to only cut 3 to 5 conifers per acre and basal retention levels are all well in excess of minimums in the Class II and Class III's. From page 113 of Sec. 4 Cumulative Impact assessment of the Elk THP in the Doty Creek Planning Watershed:

operations. Erosion and movement of sediment generated by the harvesting operations are restricted by the ASP Rules and other limitations of the THP. 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. 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. Proper implementation of the ASP restrictions makes potential adverse effects of timber operations within floodplains in the WAA very unlikely to occur and cumulative impacts to beneficial uses of water are not expected.

Much applicant comment on ASP rules is included in Sec. 4 of the THP applications in this planning watershed; regarding the need for them, the history of their formulation, their protective strength and importance, and how they are in play in the THP. For example, see references above from the Elk THP.

Unfortunately, the most protective of the provisions of the ASP's are not in play because their floodplain prohibition of mechanical harvesting in WLPZs is requested to be waived in an exemption in Elk and Dogwood for instance. Erroneously, the sediment deposition role of flood plains is pointed to as a reason the plan will not add to cumulative impacts. It is not addressed that cumulative impacts encompass more than just sediment impacts. Many more biological resources are effected by the floodplain and near floodplain mechanized management techniques that are being proposed. Those include the impacts to the many plant and animal species and larger communities and processes that are uniquely found in flood plain areas. Those species and communities have been repeatedly pointed out in the comments submitted in the Dogwood THP file, a nearby floodplain plan.

And, as is pointed out in the previous comments above, these submitted reassurances around expecting allowable levels of sediment impacts in this plan are hollow in the light of the inadequate THP assessment of sediment yields from the roads and skid trails in this and other nearby THPs that will add their cumulative impacts to this plan. See the Kamman Review, attached.

Visual Resources Impacts

The potential cumulative impacts to visual resources from this THP are inadequately addressed due to the failure to submit an assessment of those impacts with an appropriately designed and submitted assessment area for visual impacts. The RPF has submitted a checked box response alleging no potential visual impacts in "all of the area within a 0.7 mile radius of the plan area". Due to: 1.) the evenage Group Selection and other silviculture proposed directly adjacent to two paved county roads that border this THP, 2.) the existence on these county roads of longer views than .7 miles of the proposed harvest operations, 3.) no submitted analysis of visual impacts, the cumulative impacts section of this THP on this issue alone needs to be rejected and resubmitted with proper analysis and mitigations.

Delineation of Flood Prone Area

The extent of the flood prone areas in this plan should be extended out to include the entire valley floor for the maximum protection from fully applied ASP (Anadromous Species Protection) rules without exceptions. This recommendation is strongly pointed to by the letter submitted to the file on the Elk THP by Danielle Castle (CDFW Environmental Scientist) in her 69 page PHI report with its supporting document by Mark Smelser (CDFW Senior Engineering Geologist) regarding the extent of the "flood prone area".

Any damage to the floodplains below this plan will add to those cumulative impacts from other plans in this 2000 acres of scientifically proven crucial floodplain resource that contributes unique environmental services for endangered and all other plant and animal species in the Gualala River watershed ecosystem.

Summary

The missing visual effects analysis, the flawed sediment delivery analysis (ECP), and the consequently flawed cumulative effects analysis require denial of this plan application as presented and also require future THP iterations in re-applications to correct these fatal flaws and employ the maximum use of all mitigations, existing protective regulations, and compliance with the existing TMDL to prevent degradation of the EPA 303d listed Gualala River and its watershed.

Please respond to and also incorporate these comments into the 1-20-00150-MEN "Far North" comment files.

Respectfully submitted,
For Friends of Gualala River
Chris Poehlmann
Annapolis Ca.
707-888-4252

Letter from Kamman Hydroloty & Engineering, Inc.

November 20, 2020
Mr. Michael Lozeau, Lozeau/Drury LLP
1939 Harrison Street, Suite 150
Oakland, CA 94612

Subject: Estimated Roadway Sediment Yields,
Far North THP: 1-20-00150 MEN, Mendocino County, California

Dear Mr. Lozeau:

I have been retained to estimate the sediment yield from surface erosion of roadways within and appurtenant to the Far North Timber Harvest Plan (THP) and lying within the North Fork Gualala River watershed. This letter presents the approach, methods and results of the road surface erosion analysis. It also contains a summation of annual sediment yields to the North Fork Gualala River from roads and skid trails within the Far North, Elk (1-19-098 MEN) and Little (1-18-095) THPs.

It is important to note that other sources of erosion and sediment yield from road related gullying, road related landslides and road-stream crossing failures were not estimated in this analysis due to the lack of available information. Including these processes and sediment yields would significantly increase the sediment yield values presented herein.

1.0 Approach and Methods

Estimating road surface erosion volumes followed the "Measuring and Estimating Future Erosion Volumes" (page X-34) approach and methods presented in Part X (Upslope Erosion Inventory and Sediment Control Guidance) of the California Salmonid Stream Habitat Restoration Manual (March 2006). Specific variables and assumptions used in this analysis include the following.

- Road types and lengths were determined and measured from the Far North THP Harvest Method Map 14JUN20 (Figure 1) and Appurtenant Roads maps (Figure 2a and 2b).

- This analysis included THP roads draining to the North Fork Gualala River. The cumulative drainage area within the THP boundaries that contributes runoff to the North Fork Gualala River is 0.33 square miles.
- The road and cut bank width are assumed to be 25 feet, a common assumption presented in California North Coast THP Erosion Control Plans such as the Elk THP (1-19-098-MEN) and Little THP (1-18-095-MEN).

Kamman Hydrology & Engineering, Inc. 2

- Road surface lowering erosion rates (in feet/year[ft/yr]) were taken from the Habitat Restoration Manual and were applied as follows:

- native surfaced (unimproved, dirt) roads and adjacent cutbanks and continually bare soil areas- 0.03 ft/yr; and
- rock surfaced roads and adjacent cutbanks and continually bare soil areas - 0.02 ft/yr.

- To convert sediment volume to weight, a wet bulk density of 1.17 grams per cubic centimeter (g/cc) (73.04 pounds per cubic foot [lbs/ft³]) was applied. This bulk density is an average of bulk densities reported for the Ornbaun-Zeni and Irmulco-Tramway complex soils, which underlie the majority of THP site. The site soil map and bulk density value was obtained from the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Web Soil Survey site¹.

¹ <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

2.0 Results of Far North THP Analysis

Table 1 presents the total length, area and eroded sediment yield from roads within the THP boundary. A road surface erosion rate of 0.03 ft/yr was applied to these seasonal roads. The total potential sediment yield to the North Fork Gualala River from road surface erosion is 540.2 cubic yards per year (yd³/yr).

Table 2 presents the conversion of sediment yield from yd³/yr (Row 1) to tons/yr (Row 5). Dividing the sediment yield of 533 tons/yr by the THP drainage area to the Little North Fork Gualala River (0.33 square miles) yields a maximum annual sediment yield of 1,609 tons/mi²/yr. This value assumes 100% of road surface erosion is delivered to the river. Assuming that 50 percent of the roads within the THP boundary are hydraulically disconnected from the creek results in 804 tons/mi²/yr of sediment delivery to the North Fork Gualala River.

In addition to roads within the THP boundary, the appurtenant harvest and haul roads experience surface erosion that yields sediment to the river. Table 3 presents the total length, area and sediment yield from the appurtenant roadways associated with timber harvest (Figure 1) and hauling (Figure 2a and 2b). These appurtenant roads will contribute an additional 1,035 yd³/yr (1,021 tons/yr) of sediment to the river assuming 100% of appurtenant roadway erosion is delivered to the river (see Tables 3 and 4). Assuming that 50 percent of the THP appurtenant roads are hydraulically disconnected from the creek results in 510 tons/mi²/yr of sediment delivery to the North Fork Gualala River (Table 4).

3.0 Cumulative Impacts

I have completed similar sediment yield analyses for the Elk and Little THPs located in the North Fork Gualala River watershed immediately adjacent to and downstream of the Far North THP (Figure 3). The results of these analyses are presented in my letters to you dated August 11, Kamman Hydrology & Engineering, Inc. 3

2020 and August 12, 2020 respectively. The sediment yield from road and skid trail erosion for the Far North, Elk and Little THPs are summarized in Table 5 along with respective drainage areas. Totalling the sediment yield from all three THPs yields a maximum annual sediment yield of 2,353 tons/mi²/yr. This value assumes 100% of road and skid trail surface erosion is delivered to the river. Assuming that 50 percent of the roads and skid trails within the THP boundary are hydraulically disconnected from the creek results in 1,176 tons/mi²/yr of sediment delivery to the North Fork Gualala River.

Please feel free to contact me with any questions regarding the material and conclusions contained in this letter.

Sincerely,

Greg Kamman, PG, CHG
Principal Hydrologist Kamman Hydrology & Engineering, Inc. 4



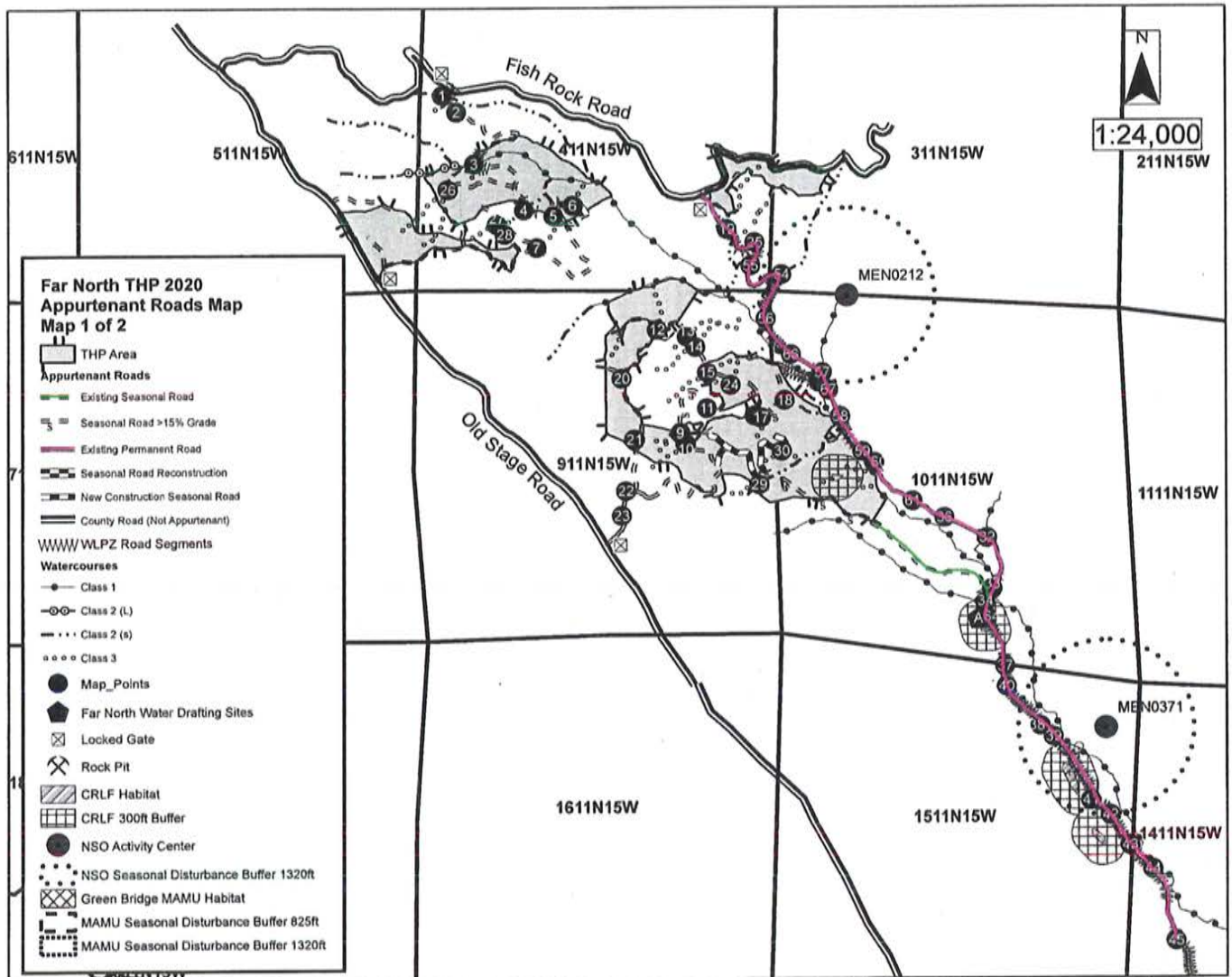


FIGURE 2a: Appurtenant Road Map

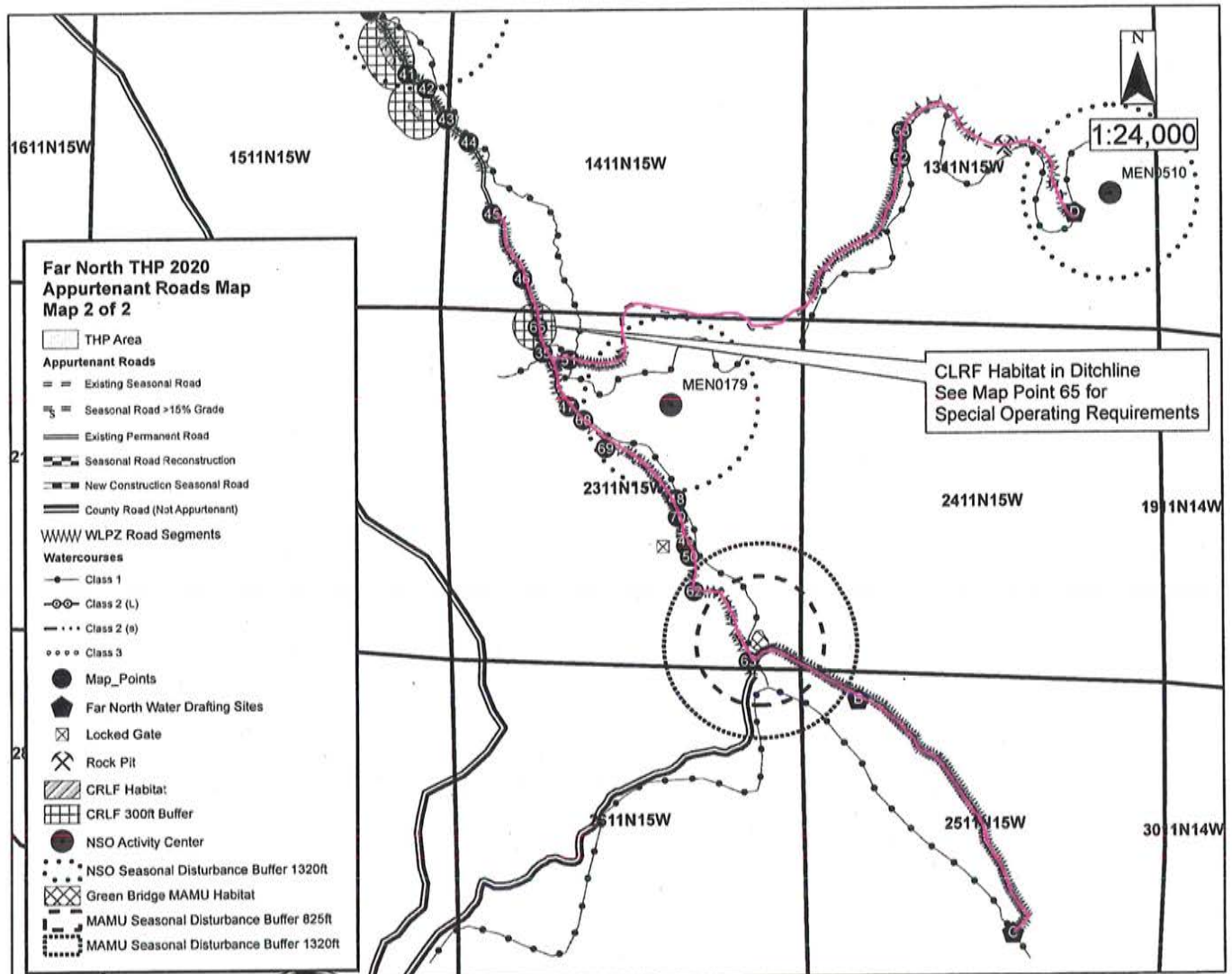


FIGURE 2b: Appurtenant Road Map (continued)

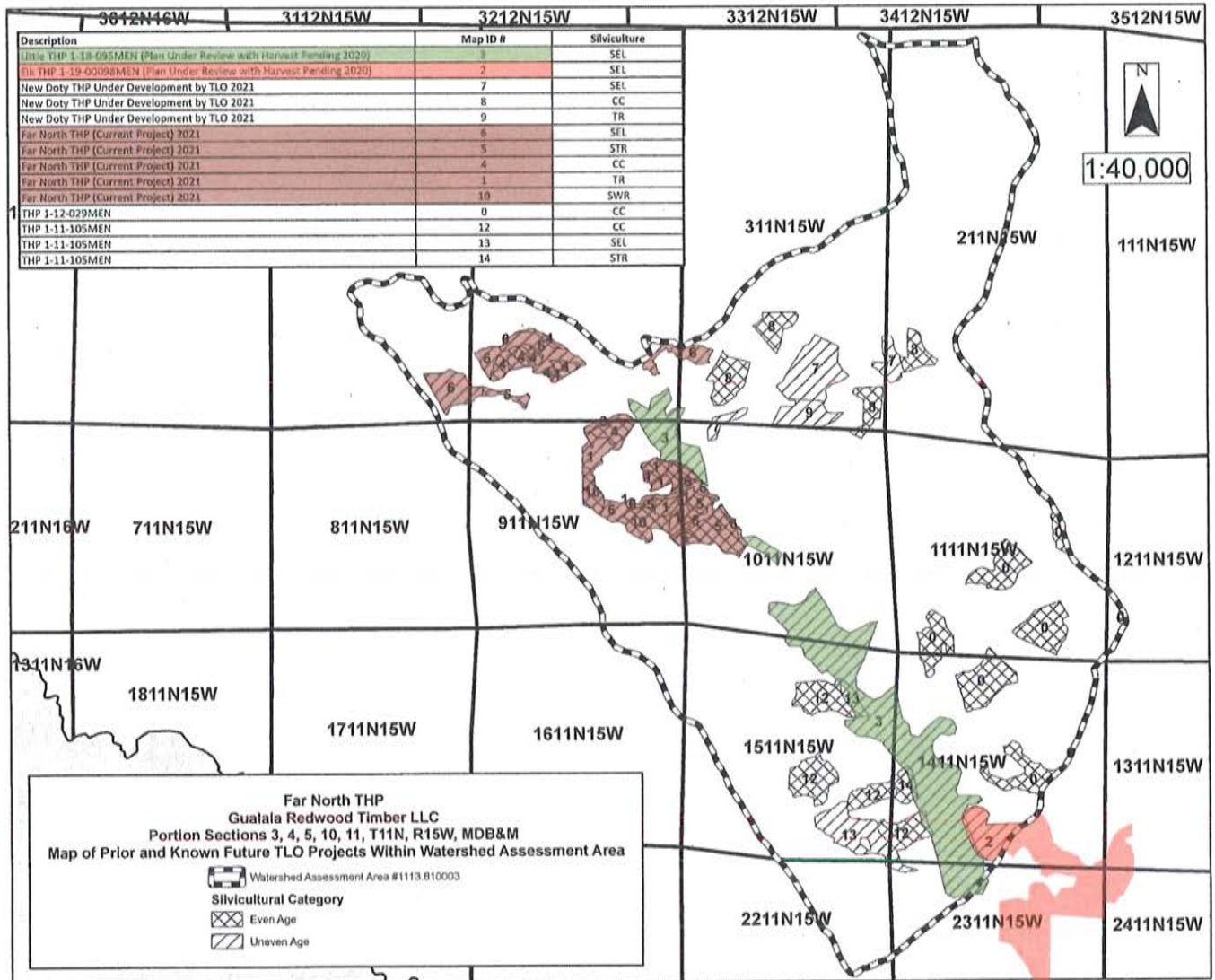


FIGURE 3: Locations of Far North, Elk and Little THPs

TABLE 1: Lengths, surface areas and sediment yield estimates for roads within Far North THP boundary

	Far North THP Road Types	
	THP Seasonal	
total road lengths (ft)	19,447	
road width (ft)	25	
road area (ft²)	486,175	
erosion rate (ft/yr)¹	0.03	
sediment yield (ft³/yr)	14,585	
sediment yield (yd³/yr)	540.2	540.2 yd³/yr

Notes

1) Erosion rates: a) native surface (unimproved, dirt) roads = 0.03 ft/yr; rock surfaced roads = 0.02 ft/yr (Source: Upslope Erosion Inventory and Sediment Control Guidance, Part X, California Salmonid

TABLE 2: Calculation of total sediment yield for disconnected roads within the Far North boundary

Row	Calculations	Notes
1	540.19 yd ³ /yr	sed yield
2	73.04 lbs/ft ³	bulk density from NRSC Soils Report
3	1,972.10 lbs/yd ³	
4	0.99 tons/yd ³	
5	532.66 tons/yr	sed yield
6	0.331 mi ²	total drainage area
7	1,609 tons/mi²/yr	sed yield: assumes 100% of erosion delivered to creek
8	804 tons/mi²/yr	sed yield: assumes 50% of erosion delivered to creek

TABLE 3: Lengths, surface areas and sediment yield estimates for appurtenant roads to the Far North THP boundary

	Far North THP Appurtenant Roads			
	Harvest Appurtenant Road Seasonal	Harvest Appurtenant Road Permanent	Haul Appurtenant Road Permanent	
total/trail lengths (ft)	12,695	1,341	41,855	
road/trail width (ft)	25	25	25	
road/trail area (ft ²)	317,375	33,525	1,046,375	
erosion rate (ft/yr) ¹	0.02	0.02	0.02	
sediment yield (ft ³ /yr)	6,348	671	20,928	
sediment yield (yd ³ /yr)	235	25	775	1,035.0 yd³/yr

Notes

1) Erosion rates: a) native surface (unimproved, dirt) roads = 0.03 ft/yr; rock surfaced roads = 0.02 ft/yr (Source: Upslope Erosion Inventory and Sediment Control Guidance, Part X, California Salmonid Stream Habitat Restoration Manual, 2006)

TABLE 4: Calculation of total sediment yield from appurtenant roads to the Far North THP boundary

Calculations	Notes
1,035.0 yd ³ /yr	sed yield
73.04 lbs/ft ³	bulk density from NRSC Soils Report
1,972.10 lbs/yd ³	
0.99 tons/yd ³	
1,021 tons/yr	sed yield: assumes 100% of erosion delivered to creek
510 tons/yr	sed yield: assumes 50% of erosion delivered to creek

TABLE 5: Calculation of total sediment yield for disconnected roads and skid trails within the Far North, Elk and Little THPs

	Far North THP	Little THP	Elk THP	Total
Annual Sediment yield (tons/yr)	532.66	1,226.29	560.50	2,319.4
Drainage area (mi ²)	0.33	0.41	0.25	0.9
Sediment yield (tons/mi ² /yr) - assumes 100% of erosion delivered to river	1609	3026	2247	235
Sediment yield (tons/mi ² /yr) - assumes 50% of erosion delivered to river	804	1513	1124	117