



**Humboldt
Redwood™**

March 25, 2014

Mr. Matthias St. John
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd, Suite A
Santa Rosa, CA 95403

Subject: Application for Coverage of a portion of THP 1-12-017 HUM (Tip Top) under Watershed-Wide Waste Discharge Requirement (WWDR) Order No. R1-2006-0039 / North Fork Elk River WWDR, "Tier II".

Dear Mr. St. John:

HRC is requesting Tier II enrollment under Watershed-Wide Waste Discharge Requirement (WWDR) Order No. R1-2006-0039 for portions of THP 1-12-017 HUM. The enrollment is comprised of 93.3 acres of group selection/selection, (46.7 clear-cut equivalent acres). Total acres currently enrolled or proposed for enrollment under Order No. R1-2006-0039 Tier II is shown in the Attached Pre-Harvest Planning Report. The Erosion Control Plan (ECP) was submitted with the THP.

Landslide risks associated with this plan were evaluated in compliance with the Freshwater Creek and Elk River WWDR Permit Acreage Enrollment and Compliance Monitoring Program Quality Assurance Project Plan (Version 2.0, September 1, 2006) approved by the Executive Officer of the North Coast Regional Water Quality Control Board, as part of THP preparation. The Licensed Geologist performed this analysis in the Geology report included in the plan. This approach uses commonly accepted standards for geologic practices in forest management (Sidle et al. 1985, Soeters and Van Western 1996, and Sidle and Ochiai 2006) to assess factors known to contribute to landslides, such as steepness of slope, slope convergence, hydrology, geologic features, and visibly unstable areas. Overlapping and complementary scientific techniques combining state-of-the-art digital elevation model (DEM) slope stability models, field investigation, and terrain analysis were used in this assessment.

The THP is laid out in the upper reaches of Lake Creek and along the ridge separating Corrigan Creek from the South Branch of the North Fork of Elk River (SBNFER). No slopes proposed for harvest drain towards Corrigan Creek. Slopes proposed for harvest that drain towards SBNFER encompass the upper reaches of Class II and Class III tributaries.

Consistent with our observations, CGS (2005) maps Undifferentiated Wildcat Group sediments underlying the unit. CGS (2005) maps the upslope extent of four deep-seated landslides within the unit (Figure 2). These landslides are characterized as dormant old to dormant mature rotational landslides and one dormant young earthflow. Based on our review, these entities did not exhibit evidence of adjustment following the initial harvest. Well entrenched Class II watercourses within the western portion of the unit are mapped within debris slide amphitheater slopes I source areas. We did not observe morphology consistent with this in the field.

HRC Staff has identified one small landslide within the unit. The landslide is less than 50 feet in length and width and appears shallow. The nearest watercourse is approximately 200 feet down slope of the landslide.

The services of a California State licensed professional geologist were retained during the layout of this THP. A California Geologic Survey Note 45 compliant report was published by the project geologist that documents their consultation on this project.

Greater detail regarding this landslide hazard assessment is provided in the attached "TIP TOP LAKE THP, HUMBOLDT COUNTY, CALIFORNIA UNSTABLE AREAS DISCLOSURE". The licensed geologist involved with the Tier 2 landslide risk evaluation has concluded the proposed harvest operation, if implemented as planned and approved, will result in a negligible increase in potential for post-harvest landsliding; and thereby meets the applicable Zero Delivery of landslide related sediment performance standards of NCRWQCB Orders R1-2006-0039 and R1-2008-0071.

While the THP is covered under the watershed wide WDR, the discharger is and will remain in compliance with the Terms and Provisions of this Order. Other portions of the plan will be, or have previously been subsequently enrolled.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information is, to the best of my knowledge and belief true, accurate and complete.

Please do not hesitate to contact me should you have any questions or comments regarding this application for enrollment into WWDR (Order No. R1-2006-0039).

Respectfully,



Tom Schultz,
Area Manager, RPF #1910
Humboldt Redwood Company, LLC

Attachments:

Pre-harvest Planning Report Table
Enrollment Map
Professional Certification of Design (Geo Report)
Erosion Control Plan
THP Section 1 Cover page

HRC 2014 PreHarvest Planning Report Addendum #1

25-Mar-14

Table 1. Proposed 2014 Harvest Enrollments for North Fork Elk River.

| THP Name | THP Number | Unit Number | Silviculture | | | | | CC Equivalent |
|---|------------|-------------|--------------|-----|----|-----|------|---------------|
| | | | CC | ROW | CT | SHR | SEL | |
| Dunlap Brown | 11-054 | 12 T1 | | 0.3 | | | 8.2 | 4.4 |
| Tip Top lake | 12-017 | 1 T1 | | 0 | | | 12 | 6.0 |
| Tip Top lake | 12-017 | 1 T2 | | | | | 93.3 | 46.7 |
| Three Forks | 13-005 | 2 T1 | | | | | 2.5 | 1.3 |
| Three Forks | 13-005 | 6 T2 | | | | | 14.6 | 7.3 |
| Three Forks | 13-005 | 7 T2 | | | | | 15.1 | 7.6 |
| McDoe | | | | | | | | 0.0 |
| | | | | | | | | 0.0 |
| Total CC Equiv. Acres for 2014 enrollment | | | | | | | | 73.2 |

Table 3. Summary of THPs by Yarding System and Site Preparation for North Fork Elk River.

| THP Name | THP Number | Unit Number | Yarding System | | | Site Preparation | |
|--------------|------------|-------------|----------------|--------|------------|------------------|-----------|
| | | | Ground Based | Yarder | Helicopter | Mechanical | Broadcast |
| Dunlap Brown | 11-054 | 12 | 3.5 | 5 | | | |
| Tip Top lake | 12-017 | tier 1 | 0 | 12 | | | |
| Tip Top lake | 12-017 | Tier 2 | 21.6 | 71.1 | | | |
| Three Forks | 13-005 | 2 | 2.5 | | | | |
| Three Forks | 13-005 | 7 | | 14.6 | | | |
| Three Forks | 13-005 | 6 | | 15.1 | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

*The acres represented here have been converted to High Hazard Acres by multiplying by 12.807.

Discharge Monitoring Plan (Tier I). Hazard Acreage Totals, in Table 2, are listed below to demonstrate compliance with the Staff Landslide Model limit of 266 Tier I Harvest Acres in Freshwater Creek. Other THP Units will be enrolled after approval of the aforementioned Monitoring Plan

No Highlight Indicates a THP and Specific Unit to be enrolled after establishment of an enforceable Zero Discharge Monitoring Plan (Tier II).

| | |
|---|------|
| Total Clear Cut Equivalent Acres to be enrolled in 2014 | 73.2 |
|---|------|















Table 2. Summary of THPs to enrolled prior to establishment of Zero Discharge Monitoring Plan for North Fork Elk River.

| THP Number | Unit Number | Harvest | | Hazard | |
|------------|-------------|---------|------|--------|-------|
| | | Acres | Low | High* | High* |
| 11-054 | 12 T1 | 8.5 | 7.1 | 17.9 | |
| 12-017 | 1 T1 | 12 | 11.5 | 6.4 | |
| 13-005 | 2 T1 | 2.5 | 0 | 32.0 | |
| | | | | | |
| | | | | | |
| | | | | | |
| Totals | | 23 | 75.0 | | |

Tip Top Lake
Topographic Map

T3N R1E Sec. 2, 3, 11 HB&M

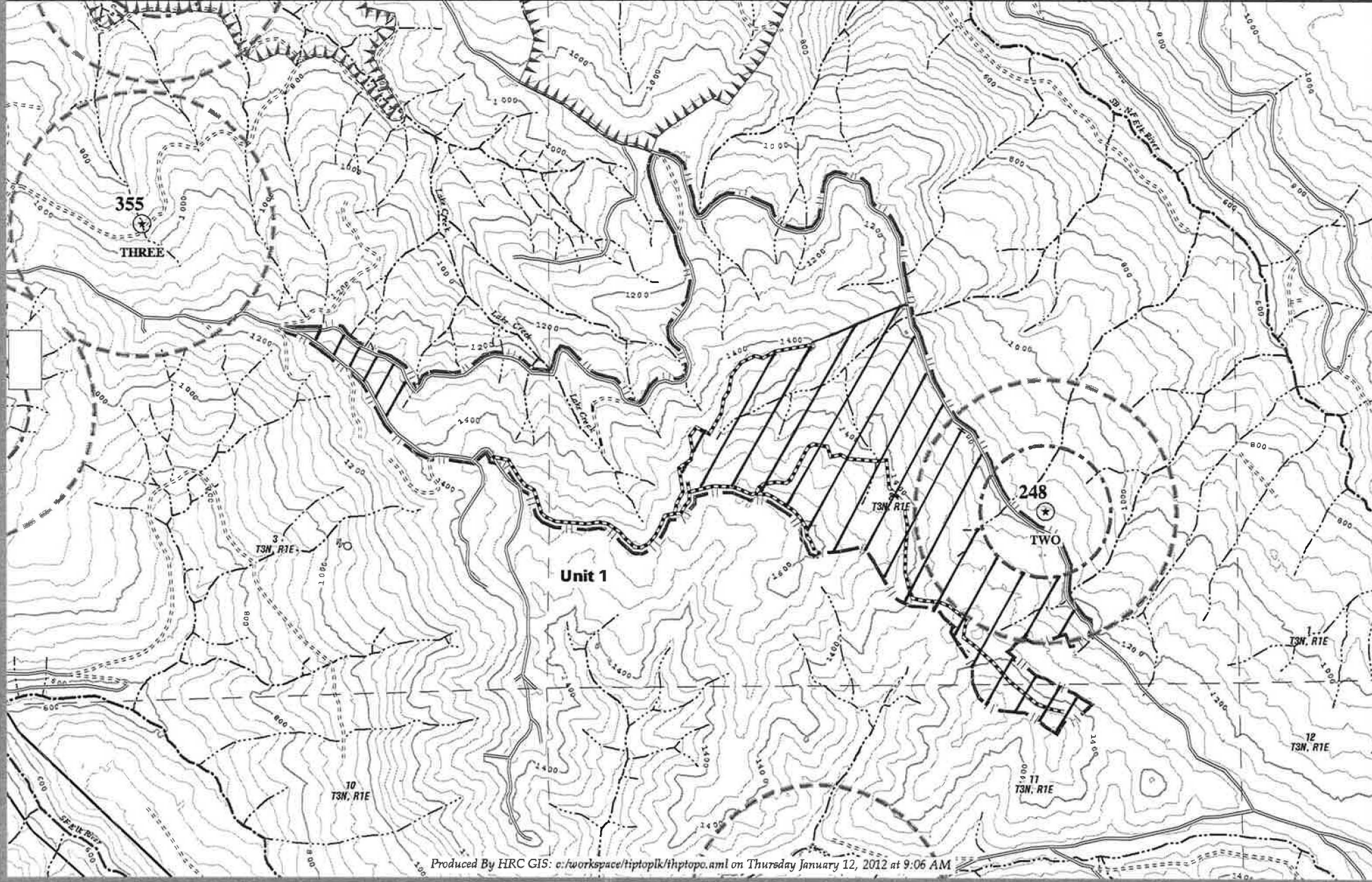
USGS Quad (s) : MCHINNEY CREEK

-  Property Line
-  Harvest Boundary
-  Permanent Road
-  Seasonal Road
-  Temporary Road
-  Proposed Seasonal Road
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Class II Waters
-  NSO Site
-  500' NSO Buffer
-  1000' NSO Buffer
-  HRA

 **TIER 2**

Map Scale: 1 inch = 1000 feet
Contour Interval: 40 feet

TIER 2 ENROLLMENT



Professional Certification of Design

I SHANE M. BEACH, PG. 7396, 4/5/13
Name License # Date



Signature

hereby certify, in accordance with North Coast Regional Water Quality Control Board (NCRWQCB) Order Nos. R1-2006-0039 and R1-2006-0041, that the attached application and the description of THP modifications, and the materials submitted along with:

THP No. 1-12-017 HUM (Tip Top Lake) Unit # 1

- a. are in accordance with accepted practices, and recognized professional standards;
- b. comply with the requirements of the Monitoring and Reporting Program No. R1-2008-0071, approved by the Executive Officer of the North Coast Regional Water Quality Control Board; and
- c. provided that the THP is properly implemented, operated, and maintained, are adequate for the THP to meet the applicable Zero Net Delivery performance standards of NCRWQCB Orders R1-2006-0039, R1-2006-0041, and R1-2006-0103, insofar as such performance can reasonably be predicted by accepted engineering geologic practices.

The opinions presented in the subject THP have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineering geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report.



Humboldt Redwood
COMPANY, LLC

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125 Main Street
Scotia, CA 95565
(707) 764-4472
www.hrcllc.com

January 19, 2012

TIP TOP LAKE THP, HUMBOLDT COUNTY, CALIFORNIA

UNSTABLE AREAS DISCLOSURE

Prepared for: Mr. Dave Rogers, RPF.
P. O. Box 712
Scotia, CA, 95565

INTRODUCTION

This discussion addresses the disclosure of known unstable areas within the Tip Top Lake THP. The Forester has applied the *Hillslope Management Checklist (HMC) for the Elk River and Salmon Creek (ERCS) watershed Analysis Unit (HRC, 2005)*. Unstable areas, identified by the Forester and staff from our department, within the unit have been removed from harvest (Figure 1). All of the unstable areas identified are located within either the no harvest inner band or do not deliver to a watercourse. Where the unstable areas exist outside of the no harvest inner band, no timber has been marked for harvest within the landslides.

The THP is laid out in the upper reaches of Lake Creek and along the ridge separating Corrigan Creek from the South Branch of the North Fork of Elk River (SBNFER). No slopes proposed for harvest drain towards Corrigan Creek. Slopes proposed for harvest that drain towards SBNFER encompass the upper reaches of Class II and Class III tributaries.

Consistent with our observations, CGS (2005) maps Undifferentiated Wildcat Group sediments underlying the unit. CGS (2005) maps the upslope extent of four deep-seated landslides within the unit (Figure 2). These landslides are characterized as dormant old to dormant mature rotational landslides and one dormant young earthflow. Based on our review, these entities did not exhibit evidence of adjustment following the initial harvest. Well entrenched Class II watercourses within the western portion of the unit are mapped within debris slide amphitheater slopes / source areas. We did not observe morphology consistent with this in the field.

The Forester identified one small landslide within the unit (Figure 1). The landslide is less than 50 feet in length and width and appears shallow. The nearest watercourse is approximately 200 feet down slope of the landslide.

Section 3 of the HMC requires assessment of all earthworks constructed on slopes inclined greater than 30% and within 300 feet of a watercourse for potential failure resulting from harvest. Specifically, a California Licensed Geologist (CLG) is to review 1) two or more skid trails converging, 2) disruption of natural drainage patterns that has resulted in emergent groundwater and/or wet converging slopes, and 3) roads, landings, or skid trails exhibiting signs of potential instability such as bank or fill failures, oversteeped fills, and unmitigated eroding drainage. The review is to determine if unstable conditions exist prior to harvest or as a result of the proposed harvest. Should the CLG consider the area to be a high hazard area and harvest operations are desired, then Very High Hazard prescriptions are to be implemented and a Note 45 (CGS, 1999) report is to be compiled.

Convergent skid roads, steeply inclined fillslopes, and eroding tractor crossings were identified within 300 feet of watercourses within the unit. However, we did not see evidence to suggest that they were unstable, or that in response to the proposed selection harvesting, would become unstable. Therefore, we do not consider them to represent Very High Hazard.

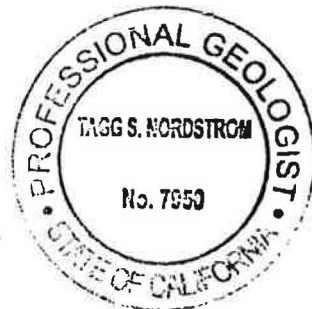
Timber harvesting appears to have initially occurred after 1965 and prior to 1981. The entire unit appears to have been extensively tractor yarded as evidenced by aerial photograph observed skid trails. No harvesting has occurred in the unit to date since the initial harvest. As such, the returning forest is comprised of stump clump and single stem trees as well as infrequent brush. The fillslopes and road surfaces of the skid roads are currently supporting a moderately dense stand of mature 2nd growth trees. Only a portion of these trees will be harvested as a result of the proposed selection silviculture. We found no evidence to suggest that selective harvesting of timber from these locations would significantly increase the potential for mass wasting.

Based on our review and consistent with both the Forest Practice Rules and the HCP, it appears the Forester has appropriately identified and mitigated the unstable areas that are the most likely to be effected by harvest activities. We trust this document meets your needs requiring the disclosure of known unstable areas throughout the Tip Top Lake THP. Should you have any questions, please contact the Humboldt Redwood Company Geology Department.

Respectfully,



Tagg Nordstrom, P.G. 7950
Senior Geologist
Humboldt Redwood Company



Spencer Watkins, G.I.T. 177
Senior Geology Technician
Humboldt Redwood Company

ATTACHED FIGURES

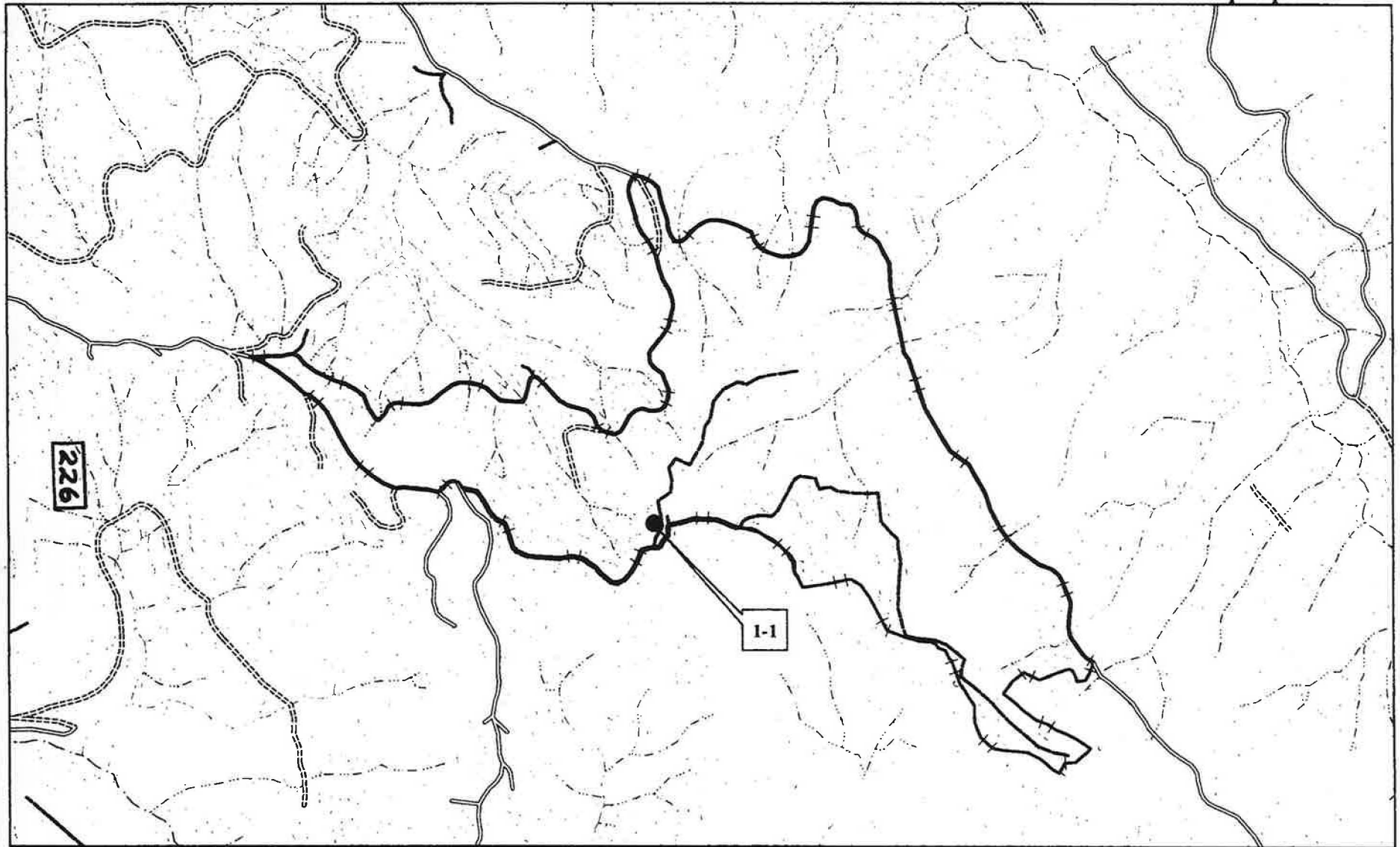
- Figure 1: Unstable areas map
- Figure 2: Geology and Geomorphic Features Related to Landsliding (Marshall and Mendes, 2005)
- Figure 2a: Key to Figure 2 symbols

REFERENCES

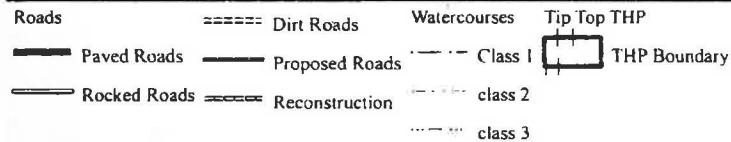
- CDF, 2008, California Forest Practice Rules.
- CGS, 2005, Marshal and Mendes, Geology and Geomorphic Features Related to Landsliding, Elk River Watershed, Humboldt County, California, Watershed Mapping Series.
- CGS, 1999, Note 45, Guidelines for Engineering Geologic Reports for Timber Harvest Plans.
- CLFA, 1999. Guide To Determining the Need For Input From A Licensed Geologist During THP Preparation. [Online URL]: <http://www.clfa.org/geologyguide>, accessed June 10, 2002
- HRC, 2005, Humboldt Redwood Company (HRC) Prescriptions Based on Watershed Analysis for Elk River and Salmon Creek (ERSC), California, dated April 20, 2005.

AERIAL PHOTOGRAPH REFERENCES

- California Department of Natural Resources, Division of Forestry, 1954 black and white photographs, flight CVL-14N, frames 131 and 132, September 11, 1954, nominal scale 1:12,000.
- USDA Soil Conservation Service, 1965 black and white photographs, flight line 13FF frame 190, dated August 29, 1965, nominal scale 1:20,000.
- 1981, Cascade Aerial Maps and Surveying, Inc., black and white photographs, flight C-HUM-81, flight line B24 12B, frames 25 and 26, dated June 2, 1981, nominal scale 1:12,000



HRC LiDAR, 40 foot contour intervals



HRC Geology Department

Drawn by: smw

Date: 1-16-2012

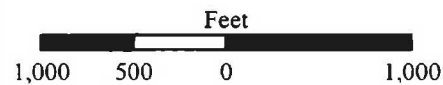
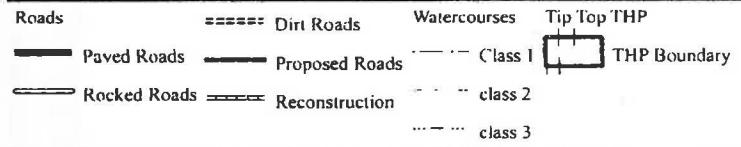


Figure 1: Unstable Areas Map



HRC LiDAR, 40 foot contour intervals



HRC Geology Department
 Drawn by: smw
 Date: 1-16-2012

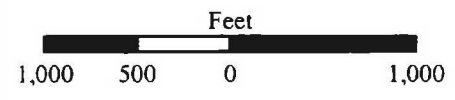

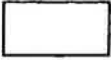
















Figure 2: Geologic and Geomorphic Features Related to Landsliding (Marshall and Mendes, 2005)

| Geologic Contacts | Landslide Activity Status |
|---|--|
|  contact, approx. located |  active to dormant historic LS |
|  contact, approx. located, concealed |  dormant LS |
|  f.a., anticline, approx. located |  LS |
|  f.a., anticline, approx. located, concealed |  Inner Gorge |
|  f.a., anticline, certain |  Debris Slide Slope |
|  fault, approx. located |  Disturbed Ground |
|  fault, certain |  bedding |
|  thrust fault, approx. located |  quarry |

Geologic Unit Descriptions

Qtwu (included in Qtw of McLaughlin and others, 2000)

Marine and non-marine sedimentary rocks of the Wildcat Group. Typically consists of poorly to moderately consolidated siltstone and fine-grained silty sandstone with some lenses of pebble conglomerate. These deposits are moderately susceptible to deep-seated landsliding, with rotational displacements in massive units and translation along planar weaknesses such as bedding planes, joints and fractures.

Ty (y1 of McLaughlin and others, 2000)

Yager terrane of the Franciscan Complex Coastal Belt. In the Elk River Watershed it typically consists of well-indurated and highly folded arkosic sandstone and argillite. The sandstone is typically very strong and often forms cliffs. The argillite is prone to slaking, and deep weathering and is often very sheared. Slopes underlain by this material are often irregular and lack well developed sidehill drainages. The slaking, shearing and deep weathering results in deep-seated flow type failures on moderate slopes.

Humboldt Redwood Company

Drawn by: smw

Date: 1-17-2012

**Figure 2a: Key to Geologic and Geomorphic Features
Related to Landsliding
Marshall and Mendez, 2005**

Humboldt Redwood Company LLC

Erosion Control Plan (ECP) for the "TIP Top Lake" THP

This plan is being included in the THP to partially meet the requirements of the North Coast Regional Water Quality Control Board Watershed-wide Discharge Requirements. (**WWDRs**)

All operational portions of this ECP that are to be enforced through the Forest Practice Rules have been included in Section II of the THP.

Version **20080819**

Humboldt Redwood Company LLC Erosion Control Plan (ECP)

This document addresses the requirements of the California Regional Water Quality Control Board, North Coast Region Order No. R1-2006-0039 (Elk River) for an Erosion Control Plan (ECP) related to timber harvest activities on Non-Federal lands in the North Coast Region (Sec. III D2 and D3). The responsible party for this ECP is Humboldt Redwood Company LLC, P.O. Box 712 Scotia, CA 95565 (707) 764-2330.

This ECP is submitted for: THP Name: **Tip Top Lake**

Contact Person: **Jon Woessner** Phone: **(707) 764-4376**

The landowner is committed to a wide variety of measures to prevent and minimize the discharge or threatened discharge of sediment from controllable sediment discharge sources as part of this project into the waters of the state in violation of applicable water quality requirements. Prevention and Minimization of Controllable Sediment Discharge Sources associated with this project are identified in the *Controllable Sediment Sources* table. The specific conditions of sediment discharge sources and a summary of prevention and minimization measures (Section I) are identified in the table. General prevention and minimization measures for the project (Section II) are incorporated in the ECP by reference.

The RPF and/or the RPF Designee have conducted an inventory of potential "controllable sediment discharge sources" within the project area. As defined in California Regional Water Quality Control Board Order No. R1-2006-0039 (Elk River).

"Controllable sediment discharge source" means sites or locations, both existing and those created by proposed timber harvest activities, within the Project area that meet all the following conditions:

1. is discharging or has the potential to discharge sediment to waters of the state in violation of applicable water quality requirements or other provisions of these WWDRs,
2. was caused or affected by human activity, and
3. may feasibly and reasonably respond to prevention."

Upon guidance of the North Coast Regional Water Quality Control Board (NCRWQCB) staff, discharge from the source must be likely to occur during the life of the Timber Harvesting Plan (THP) and WWDR. (Holly Lundborg, personal communication)

The inventory method consisted of an appurtenant road survey, aerial photos and ground assessments of the harvest units, and a complete ground assessment of all watercourses and associated stream protection zones.

The schedule for implementing the prevention and minimization management measures for the controllable sediment sources will be consistent with the duration of the THP. These measures will be implemented in accordance with the priority level assigned to each site. High priority sites will be addressed first with low priority sites to follow. Work at all sites will be accomplished prior to THP expiration. The general prevention and minimization measures will be implemented concurrent with operations.

I. Inventory and Treatment of Controllable Sediment Sources

All controllable sediment sources are listed in the attached "Erosion Control Plan" table. These sources have been assigned a treatment priority of low, medium or high based on: 1) potential for significant sediment delivery to a Class I, II or III channel; 2) treatment immediacy (a subjective combination of event probability and sediment delivery); and 3) treatment cost-effectiveness.

The Prioritization for implementing prevention and minimization measures for road-related and non road-related controllable sediment sources is based upon guidance provided in Order No. R1-2006-0039 (Elk River). Highest priority is assigned to the largest sediment discharge sources that discharge to waters that support domestic water supplies or fish. The landowner's prioritization method considers this guidance, and combines it with consideration for accessibility and level of imminent risk of significant sediment discharge. Sources that receive a high priority rating will be treated by a date certain as noted in the Controllable Sediment Sources table. Sources that receive a low or medium rating are determined to have a low to moderate risk of imminent discharge and will be treated prior to completion of the THP, or as otherwise indicated.

Non-road related controllable sediment sources can include skid road crossings, yarding furrow, skid road in watercourse, perched skid road fill, skid road rutting, landslide, layouts, railroad grade, incline, etc.

Information specific to Controllable Sediment Discharge Sources is listed in the Controllable Sediment Sources Table, below. An explanation of information provided in that table is provided below.

II. General Prevention and Minimization Measures for Controllable Sediment Discharge

In addition to the site specific measures detailed above, the general measures proposed in this project, either as required by another State or Federal regulating agency, or as a matter of Humboldt Redwood Company policy, will prevent or minimize future sediment delivery. These measures include, but are not limited to measures incorporated in the THP Section Items as follows:

THP Section II:

- Item 14 – Describes silvicultural prescriptions
 - (i) Site Preparation – Disclosure of selected site preparation treatments and mitigation measures
- Item 16 – Harvesting Practices – Describes yarding systems, equipment utilized, equipment limitations, and drainage facility installation timing
 - Inclusive through (m) – equipment use limitations and mitigation
- Item 18 – Soil Stabilization – waterbreak requirements, mitigation to minimize soil disturbance and sediment transport
- Item 20 – Ground Based Equipment Use Location
- Item 21 – Ground Based Equipment Use in Sensitive Areas – locations, descriptions of operations, limitations and mitigation measures
- Item 22 – Alternative Practices to Harvesting and Erosion Control
- Item 23 – Winter Operations – Provides descriptions of limitations and mitigation measures required during winter period operations and Winter Operating Plan
- Item 24 – Roads and Landings – Describes road and landing construction and re-construction operations, limitations, drainage relief structure installation, mitigation measures, road maintenance, inspections and wet weather road use restrictions
- Item 25 – Site Specific Measures to Reduce Adverse Impacts and Special Instructions to the LTO
- Item 26 – Watercourse and Lake Protection (WLPZ)
- Item 27 – "In Lieu" WLPZ Practice(s)
- Item 28 – Downstream Water Users Notification and Domestic Water Supply Protection Description of protection measures
- Item 29 – Sensitive Watershed – Identifies whether the plan is located in a designated sensitive watershed and mitigation measures
- Item 29 – 1 Hillslope Management (HCP 6.3.3.7) – Describes HCP hillslope management measures required as per watershed analysis

THP Section V:

- Sediment Reduction from Roads and THP Sediment Production--Including Table 1 – "Sediment Delivery for Units and Roads for this THP," references, letter regarding Road related sediment assessment for this THP with the calculations of deliverable net cubic yards of sediment, calculations and PWA information related to the THP project area when available

Maps attached:

- **Appurtenant Road**
- **Road Construction Locations/ECP Site Locator Map**

Note: On the Site Locator Map are two sites labeled No Treat: 7201 (3N1E03H601) and 7268 (3N1E02E701). Both of these sites were recently (January 2012) inspected for treatment potential because they are listed on the sediment inventory database as treat sites. Following is a description of the findings:

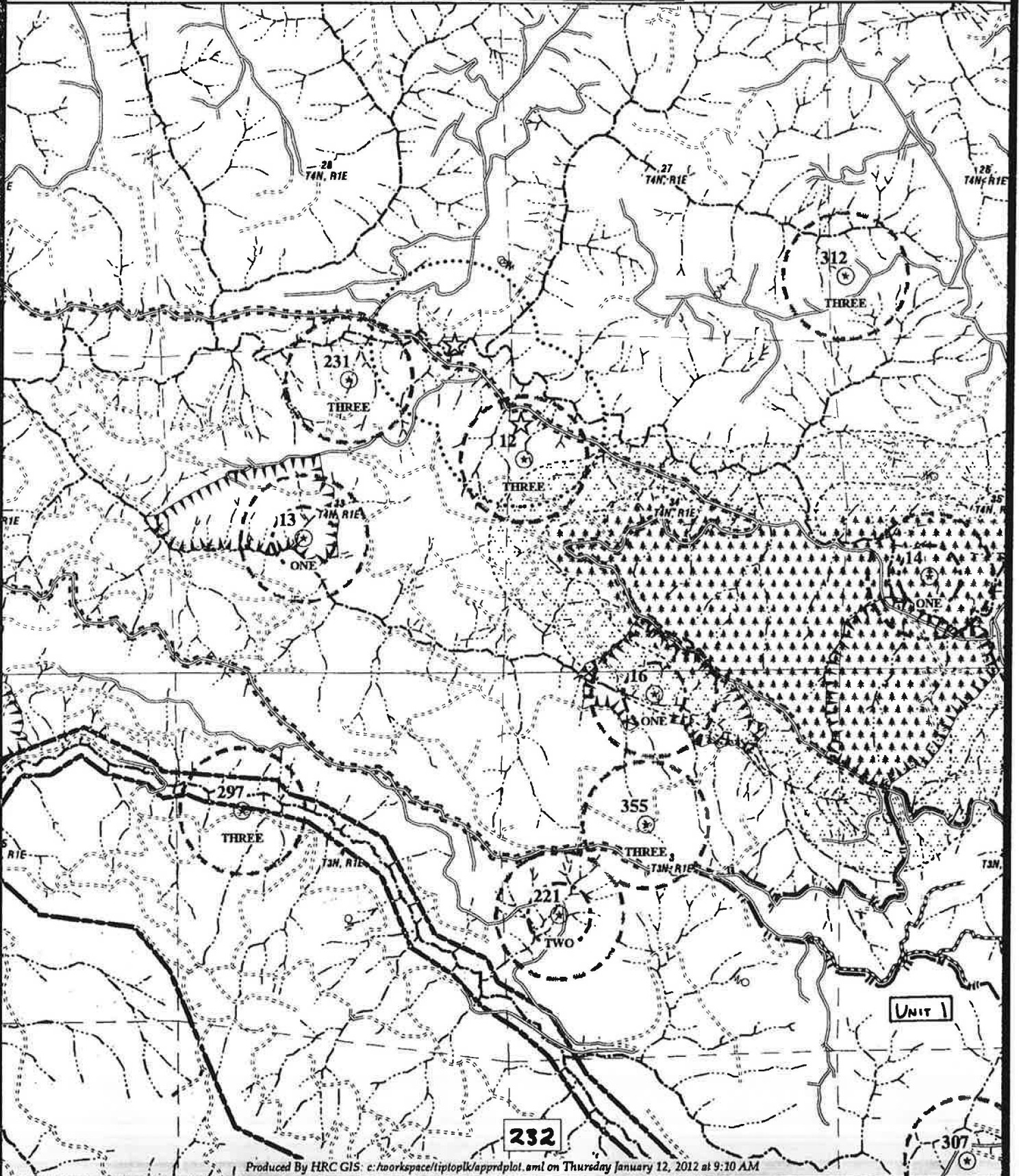
7201: A shallow tractor crossing at the junction of two Class III watercourses. Flow is subsurface with no visible signs of failure; most of the entire watercourse is subsurface. The site is well vegetated and does not have a feasible equipment access.

7268: This site is at the top end of a Class III watercourse, and is not really a true crossing. Several skid roads converge in this swale shaped area at the end of the watercourse. There is nothing to excavate at this location.



Map Scale: 1 inch = 2000 feet

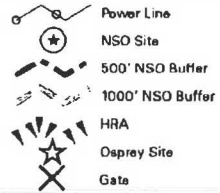
ECP Appurtenant Road Map 1 of 2



Tip Top Lake
Appurtenant Road Map

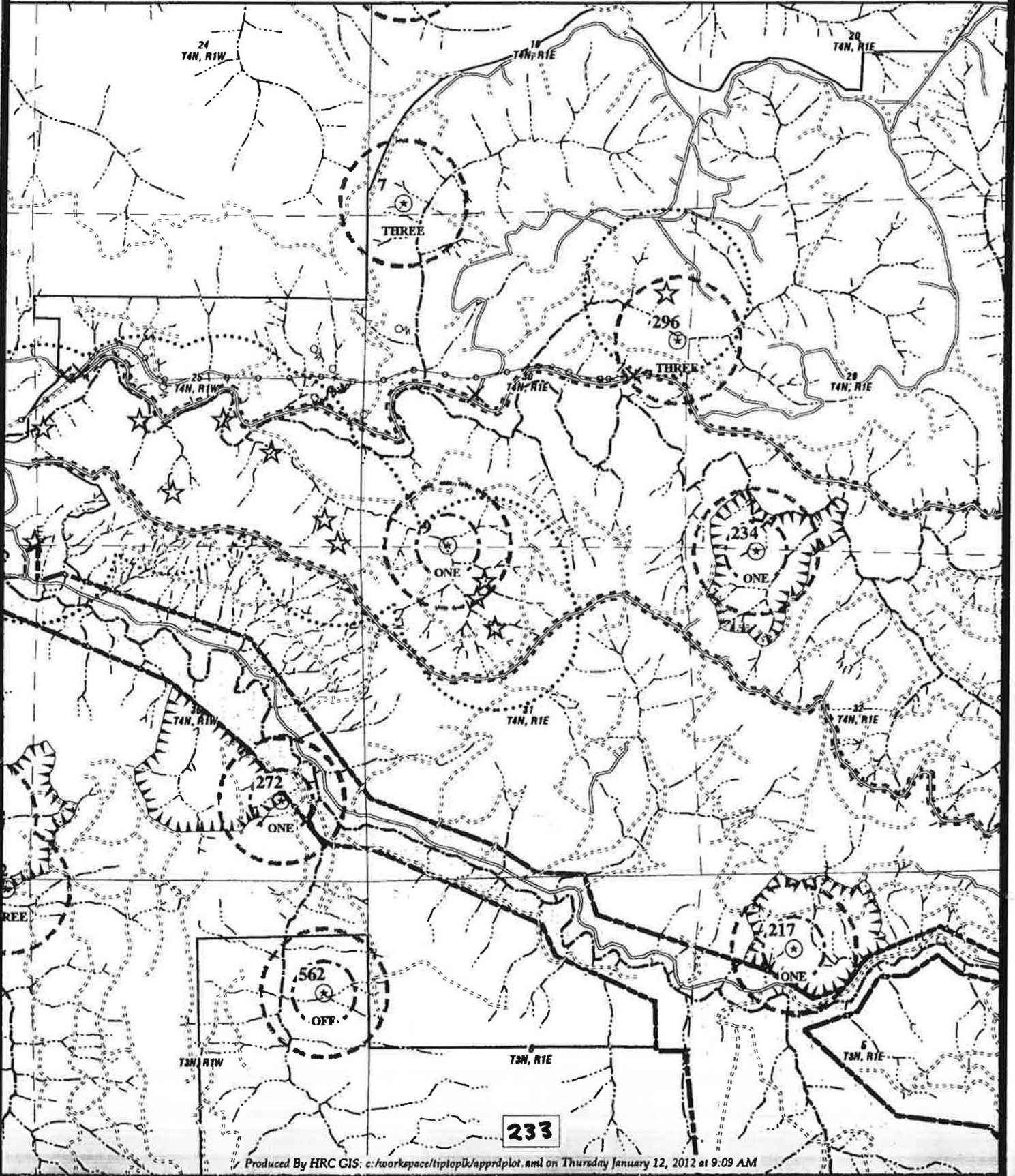
T3N R1E Sec. 2, 3, 11 HB&M

USGS Quad (s) : MCHILINNEY CREEK



Map Scale: 1 inch = 2000 feet

ECP Appurtenant Road Map 2of 2



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**Tip Top Lake
THP 1-12-017 HUM
Unit 1**

| Tools Used in This Assessment | Figure Number |
|--|---------------|
| Elevation Map with 10 ft Contours (Humboldt Redwood Company [HRC] LiDAR*) | 1 |
| SHALSTAB / Slope Class / Hillshade Maps (Montgomery and Dietrich, 1994; Palco, 2006) | 2 |
| California Geologic Survey (CGS) Geology and Geomorphic Features (Marshall and Mendes, 2005) | 3 |
| Mass Wasting Potential Map (HRC, 1999) | 4 |
| Aerial Photo Map (HRC, 2007) | 5 |
| HRC Elk River and Salmon Creek WA deep-seated LS inventory Map (HRC, 2004) | 6 |
| Road Condition Map | 7 |

* Refer to back of enrollment package for referenced maps

Summary of Changes to THP Prescriptions Based on Tier II Analysis:

| Geologic Review | Forestry Silviculture/Site Prep Plan | Operational Design Plan |
|-----------------|--|---|
| Polygon 1-1** | <ul style="list-style-type: none"> ➤ Silviculture practices/ site preparation activities identified in the approved THP have been not modified. ➤ Group selection is the approved silvicultural practice. ➤ Site preparation is not proposed within the approved THP. | <ul style="list-style-type: none"> ➤ Yarding methods in the approved THP have not been adjusted or modified. ➤ Ground-based and cable yarding techniques are the approved methods for timber removal. |

**The proposed cut block was evaluated as a single polygon (1-1) due to general consistency in morphology, bedrock, and timber in the unit as well as similarity in response to past land use activities.

Executive Summary

(Information presented below was obtained from existing articles, reports, and maps)

Unit 1 overlaps various aspect, convex- to concave-shaped hillsides along the crest and upper flanks of the interfluvial ridgeline that separates Lake Creek and Corrigan Creek from the South Branch North Fork Elk River (SBNFER). The body of the subject unit includes the headwaters and upper reaches of a series of Class II and Class III tributaries to Lake Creek and SBNFER. The Hillslope Shade map (Figure 2) indicates that most of the prominent swales/ hollows are affiliated with Class II and Class III watercourses. In general, these watercourses appear well entrenched and have consistently low gradient channels. The unit does not occupy slopes within the Corrigan Creek drainage basin.

Regional geologic maps indicate that Unit 1 is underlain by Undifferentiated Wildcat Group sediments, which consist of interbedded layers of mudstone, silt, and fine sand with infrequent pebble and conglomerate lenses (Figure 3).

A percentage of the steeper streamside slopes in the western half of the unit were classified by Marshall and Mendes (2008) as debris slide slopes (Figure 3). The upland margins of several queried (ancient), deep-seated landslide-related landforms (translational/rotational landslides; earthflows) also fall within the operational limit of Unit 1 (Figure 3). The landslide map attached to the Landslide module of the Elk River and Salmon Creek Watershed Analysis (Figure 6) also identifies features in the general vicinity of the queried landforms of Marshall and Mendes (2008).

The Mass Wasting Potential (MWP) map indicates that a majority of the slopes in the project area have a “Low” MWP (Figure 4). These same slopes were assigned a “low” (4) landslide potential value by the SHALSTAB model (Figure 2).

One unstable area was identified within the unit, the presence of which was disclosed in a report signed by a state licensed Professional Geologist (PG) (HRC, 2012). This landslide measures less than 50 feet in length and width and is situated over 200 feet away from a watercourse. The report discussing this landslide was developed in general in accordance with CGS Note 45 guidelines (CGS, 1999) and is attached to Section V of the THP.

The THP pre-harvest investigation (PHI) was attended by staff from several state agencies. PHI reports found the THP was compliant with the California Forest Practice Rules and HCP prescriptions (HRC, 2005) with respect to disclosure of all known unstable areas.

Unit 1
Polygon 1-1

General Observations (A)

Unit 1 (polygon 1-1) occupies convergent and divergent slopes with gradients that range from 5% to 50%. Steeper pitches (60%+) are present in the plan, but are limited in acreage and dispersed across the landscape. In general, slopes with gradients in excess of 45% flank the higher order watercourses and are encompassed by no-harvest and limited entry watercourse buffer zones.

Tributaries of both Lake Creek and the South Branch North Fork Elk River fall within the operational limits of Unit 1. These watercourses are confined to well developed channels and draws. Streamside hillslopes have a smooth and well-rounded profiles that are devoid of slope morphology attributable to recent and/ or historic mass movements.

A relatively small percentage of the slopes within the plan area were assigned a "High" (2) landslide potential value by the SHALSTAB model (Figure 2). Many of these areas overlap/ abutted roadways were steep fill embankments and cut slopes were present. No slopes were allocated an "Extreme" (1) potential value.

The Mass Wasting Potential (MWP) model use to evaluate the plan area calculated a majority of the slopes to have a "Low" landslide potential. The western unit boundary overlap a thin sliver (less than 200 feet) of ground modeled as having a "Moderate" and "High" MWP. This area corresponds to steep slopes identified as the crown of a deep-seated landslide-related landform (Marshall and Mendes, 2005).

Harvest Related Impacts and Hillslope Sensitivity (B)

The project area was initially managed in a manner similar to that of a modern clear cut using ground-based equipment. Felled timber appears to have been yarded to the ridge crest or to down slope watercourses by means of skid trails and ground leads. The project area has not been subjected to timber fallen operations since the initial entry. Unit 1 currently encompasses a multi-tier stand of mature second growth redwood with lesser amounts of fir and hardwood intermixed.

One historic landslide was observed in the polygon, but occurred in an area mapped as having a “Low” MWP. This landslide will be managed in accordance with single tree selection.

Our review of SHALSTAB “High” areas revealed they overlapped moderate to steep gradient planar hillsides and poorly express swales. These landforms supported insitu old growth stumps and health upright mature second growth conifers and lack geomorphic traits commonly associated with recent or historic landslide events. We observed no evidence of recent or suspended mass movements within the areas calculated by SHALSTAB to have a “High” landslide potential. Standard management practices (HCP and CAL FIRE prescriptions) were applied to these slopes and no additional restrictions were placed on them.

The stability of the landslide-related landforms (debris slide slopes, translational/rotational landslides, and earthflows) (Figure 3) identified by prior investigators does not appear to have been adversely impacted by past land use activities. HRC Geology Department staff noted that there was no evidence of post-harvest adjustment associated with these features and that there was an absence of landslide morphology relating to recent or historic movement in these areas (HRC, 2012). State regulatory staff concluded that the landslide hazard in polygon 1-1 were appropriately disclosed and mitigated (CGS, 2012).

No slides or landforms with strong landslide type geomorphic traits were observed during our evaluation of slopes calculated as a “Moderate” or “High” MWP. These areas overlap hillsides modeled as steep (50%+) (Figure 2) and previously mapped as debris slide slopes/ landslide-related landforms (Figure 3). The combination of these two attributes (slope and slide) in the MWP model general generates values that correspond to a “Moderate” or greater MWP.

Forestry / Silviculture Plan (C)

Silviculture prescriptions proposed in the THP have not been adjusted or modified in response to this evaluation. The approved silviculture prescriptions appear appropriate for site conditions.

Operational Design Plan (D)

Yarding methods proposed in the THP have not been adjusted or modified in response to this evaluation. The approved yarding methods, appear appropriate for site conditions.

Brief descriptions of the models used in this evaluation:

SHALSTAB was first described in Dietrich and Montgomery (1994). SHALSTAB is a simple, physically-based model based on the Mohr-Coulomb failure law that can be used to map shallow landslide potential. The model calculates the potential for failure using gridded digital elevation data. The simplicity of the model lies in the formulation of slope stability parameters that allow the model to be run parameter-free using default values suggested by the authors or determined by local measurement. Because the model uses no field measurements of critical characteristics that determine slope stability, the evaluation of potential instability is only an approximation. In applying SHALSTAB for Tier 2 enrollment, HRC has run the model on a 10-m spatial grid using LiDAR elevation data and applied the parameters as suggested by the model authors. HRC's application of the method and parameters is described in HRC (2008).

Mass Wasting Potential (MWP) modeling is a cursory regional assessment that numerically values soil, slope inclination, geology type, and geomorphology with respect to past mass wasting (HRC, 1999). The sums of the values specific to an area are measured against a set ranking system that extends from very low to extreme. The model's intent is to highlight areas of high potential for instability at the planning level. The model's use at the site specific level is limited in that pedogenic soil types are used, not textures, the geologic formations utilized provide one value for all of the incorporated facies, and the model is heavily biased if past mass wasting has occurred or has been mapped as occurring in the area.

References:

- California Geologic Survey (CGS), 2005, *Geologic and Geomorphic Features Related to Landsliding, Elk River Watershed, Humboldt County, California*. Department of Conservation, now California Geological Survey Watershed Mapping Series, Mapset 4, Plate 1. Available via the web at ftp://ftp.consrv.ca.gov/pub/dmg/thp/maps/elk/elk_color.pdf
- CGS, 2012, *Engineering Geologic Review of Timber Harvesting Plan 1-12-017 HUM (Tip Top Lake), Pacific Lumber Company*. unpublished memorandum to William Snyder, Deputy Director, Resource Management California Department of Forestry and Fire Protection. NR:NR.
- Montgomery, D.R. and W.E. Dietrich, 1994. *A physically based model for the topographic control on shallow landsliding*. Wat. Resour. Res. 30: 1153-1171. For specific details regarding the model used in this evaluation, please see Palco, 2006. Additional information from the model authors is available at the following website: <http://socrates.berkeley.edu/~geomorph/shalstab>
- Humboldt Redwood Company (HRC), 1999, The Pacific Lumber Company's Habitat Conservation Plan, Vol. 2 Part D, Landscape Assessment of Geomorphic Sensitivity, Public Review Draft.
- HRC, 2004, Elk River / Salmon Creek Watershed Analysis, Scotia, California, prepared for Pacific Lumber Company (PALCO), and acquired by Humboldt Redwood Company, LLC in 2008.
- HRC, 2005, (Policy Acquired from The Pacific Lumber Company (PALCO)) Prescriptions Based on Watershed Analysis for Freshwater Creek, California, August 15, 2002.
- HRC, 2007, Ortho-photo rectified aerial photographs flown by 3Di West, Eugene Oregon,
- HRC, 2008, Freshwater Creek and Elk River WDR Permit Acreage Enrollment and Compliant Monitoring Program, NCRWQCB R1-2006—0039 and R1-2006-0041, Quality Assurance Project Plan, Version 3.0. Policy document submitted to NCRWQCB dated June 7, 2006.
- HRC, 2012, Tip Top Lake THP, Humboldt County, California Unstable Areas Disclosure, unpublished report to Dave Rodgers RPF, Humboldt Redwood Company LLC, dated January 19, 2012. Included within section V of the THP 1-12-017 HUM.

FOR ADMIN. USE ONLY
Amendments-date & S or M

- 1. _____ 7. _____
- 2. _____ 8. _____
- 3. _____ 9. _____
- 4. _____ 10. _____
- 5. _____ 11. _____
- 6. _____ 12. _____

TIMBER HARVESTING PLAN

STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY AND
FIRE PROTECTION, RM - 63 (01-00)
(Humboldt Redwood Company HCP THP Form ERSC, 7/30/08 version)
If this is a Modified THP, check box

FOR ADMIN. USE ONLY

THP No 1-12-017 HUM
Dates Rec'd FEB 14 2012
Date Filed FEB 24 2012
Date Approved APR 28 2012
Date Expires APR 28 2015
Extensions 1) 2)

Tip Top Lake

Note to THP reviewer: This Timber Harvesting Plan (THP) form, when properly completed, is designed to comply with the Forest Practice Act (FPA) and Board of Forestry and Fire Protection Rules (1/1/2001). See separate instructions for information on completing this form. The THP is divided into six sections. This THP form was modified to include operational elements of the landowner's Habitat Conservation Plan (HCP) and the Watershed Analysis prescriptions for Elk River and Salmon Creek (ERSC). Modifications include check boxes, headings, and HCP item numbers (e.g. HCP 1.1.1.1). Modifications demonstrate HCP compliance and serve as a format to facilitate implementation and compliance tracking. CAL FIRE THP Section I and II form information or questions are stated in non-underlined Arial font. RPF information is underlined Arial font. HCP language is italicized and underlined. Occasional non-underlined, underlined, and italicized Arial font text may be in bold type or quotation marks.

SECTION I - GENERAL INFORMATION

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

1. TIMBER OWNER(S) OF RECORD: Humboldt Redwood Company LLC
Address: P.O. Box 712
City: Scotia State: CA Zip: 95565 Phone: (707) 764-4472
Signature: Thomas B. Schultz, Forest Operations Manager Date: Jan 24, 2012

NOTE: The timber owner is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Section, MIC: 60, State Board of Equalization, P.O. Box 942879, Sacramento, California 94279-0060, phone 1-800-400-7115. Visit their website at WWW.boe.ca.gov.

2. TIMBERLAND OWNER(S) OF RECORD: Humboldt Redwood Company LLC
Address: P.O. Box 712
City: Scotia State: CA Zip: 95565 Phone: (707) 764-4472
Signature: Thomas B. Schultz, Forest Operations Manager Date: Jan 24, 2012

3. LICENSED TIMBER OPERATOR(S): Humboldt Redwood Co. LLC Lic No. A 10782
(If unknown, so state. You must notify CAL FIRE of LTO prior to start of operations)
Address: P. O. Box 996
City: Ukiah State: CA Zip: 95482 Phone: (707) 764-4472
Signature: Thomas B. Schultz, Forest Operations Manager Date: Jan 24, 2012

4. PLAN SUBMITTER(S): Humboldt Redwood Company LLC
Address: P.O. Box 712
City: Scotia State: CA Zip: 95565 Phone: (707) 764-4472
(Submitter must be from 1, 2, or 3 above. He/she must sign below. Reference Title 14 CCR 1032.7(a))
Signature: [Signature], Forest Operations Manager Date: 1/22/12

Note: The Humboldt Redwood Company LLC ("HRC") originated on July 30, 2008, following the purchase of The Pacific Lumber Company, and its wholly owned subsidiaries, Scotia Pacific Company LLC, and Salmon Creek Corporation (collectively referred to as "PALCO") in a reorganizational bankruptcy. All references to PALCO in

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