



Humboldt Redwood
COMPANY, LLC

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February 13, 2009

Ms. Catherine Kuhlman
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd, Suite A
Santa Rosa, CA 95403

Subject: Enrollment of THP 1-04-242 HUM (Unit 2) in the Freshwater Creek WWDR, "Tier II"

Dear Ms. Kuhlman:

HRC is requesting Tier II enrollment under Watershed-Wide Waste Discharge Requirement (WWDR) Order No. R1-2006-0041 for unit 2 of THP 1-04-242 HUM. This unit is comprised of 36.1 acres of Selection (18.1 clear-cut equivalent acres). Total acres currently enrolled or proposed for enrollment under Order No. R1-2006-0041 Tier II is shown in the Attached Pre-Harvest Planning Report provided by Forester, Mr. Wayne Rice. The Erosion Control Plan (ECP), Form 200 and an annual waste discharge enrollment fee have already been submitted for this 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. 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.

In summary The unit is located atop Franciscan sedimentary rocks faulted adjacent mélange bedrock in the east and west. One interpretation suggests the unit to be underlain by a large dormant earthflow likely in response to both uplift from faulting and compromised bedrock strength from shearing. The watercourses are well incised suggesting a long period of erosion with reactivation. Mass wasting in response to the initial clear cut, ground based harvest appears non-existent. Therefore, we consider the proposed selection harvest with implemented watercourse buffers and the removal of one high hazard area adjacent to a Class II watercourse to represent an insignificant increase in the potential for mass wasting derived sediment delivery to waters of the state. The high hazard area we removed from the unit includes steeply inclined slopes adjacent a Class II watercourse.

The THP proposes an uneven-age silviculture retaining 100 sqft of basal area. Sub-merchantable trees and those with specific wildlife value characteristics (e.g., cavities, large limbs, broken tops, snags,

etc.) will be retained within the harvest area to the extent feasible. Cable yarding is approved for the entire unit. Post-harvest no site preparation will occur.

Greater detail regarding this landslide hazard assessment is provided in the attached *THP Unit Review for Tier 2 Enrollment*. 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 R1-2006-0041 and R1-2008-0071.

Please do not hesitate to contact me should you have any questions or comments regarding this application for enrollment into WWDR (Order No. R1-2006-0041).

Respectfully,

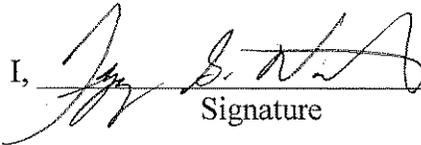


Wayne D. Rice,
RPF
Humboldt Redwood Company, LLC

Attachments:

Professional Certification of Design
THP Unit Review for Tier II enrollment
Pre-harvest Planning Report
Unit Specific ECP
Maps

Professional Certification of Design

I, , P.G. 7950, 2/16/09,
Signature license # Date



Place licensed seal here

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. 1-04-242 HUM (Fresh 1) Unit # 2

- a. are in accordance with accepted practices, and recognized professional standards;
- b. comply with the requirements of the Monitoring and Reporting Program No. R1-2006-0103, 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.

THP: Fresh 1 THP 04-242 Unit # 2 February 12, 2009

Tools Used in This Assessment	Figure Number
Elevation Map with 10 ft Contours (HRC LiDAR)	1
SHALSTAB (Montgomery and Dietrich, 1994 and Palco, 2006) / Slope Class / Hillshade Maps	2
CGS Geology and Geomorphic Features (CGS, 1999)	3
Mass Wasting Potential Map (Palco, 1999)	4
Aerial Photo Map (HRC, 2007)	5
Palco Freshwater Creek WA deep-seated LS inventory (WPN, 2001)	6
Road Condition Map	7

Please see back of enrollment for references

Geological Summary (information presented from existing bodies of work):

Figure 3 shows the upper ¼ of the unit to be underlain by Mélange of the Franciscan Complex. The lower elevations of the unit are underlain by the sedimentary rocks of the central belt of the Franciscan Complex. The contact between the two different geologic units is mapped as a fault. An additional fault that is mapped adjacent to the southwestern corner of the unit places a small portion of the lower elevations of the unit atop the mélange of the Franciscan Complex. The map also shows the entire unit to be within a large dormant earthflow. The unit is located adjacent to the left lateral margin of the earthflow. The northwestern portion of the unit is

mapped to be underlain by debris slide slopes.

Figure 6 shows the northern half of the unit to be underlain by slopes with a moderate hazard for reactivation or acceleration of movement. The southern half of the unit is underlain by low to moderated hazard slopes. High hazard slopes are mapped adjacent to, outside of, and within a different drainage basin than the unit to the southwest.

The Hillslope Shade map (Figure 2) shows the slopes to be weathered and deeply incised. The shade map does not depict with certainty the existence of a dormant earthflow.

The mapping presented in this packet was conducted after the initial, turn of the century, regional clearcutting, ground based yarding, and repetitive burning of the harvest plan area. The stand has been recently (last 20 years) commercially thinned within a combination of cable and ground based yarding. No new roads are proposed for construction to access the unit to accommodate the harvesting of the timber.

The plan area was first harvested during the 1920s.

The forester reviewed the plan for unstable areas per CLFA guidelines and did not observe any indicators within the unit to require a THP Note 45 Report. No unstable areas were identified in the harvest unit. Two landslides were identified during watershed analysis. They are located adjacent to and outside of the unit. These landslides are road related and occur to the southeast of the unit. That road is not proposed for use in this THP. The THP was reviewed by various agencies during PHI and found to be compliance with Forest Practice Rules with respect to the disclosure of all known unstable areas.

The harvest unit was evaluated at the THP level with respect to clearcut silviculture. As mandated by new management, the silviculture has changed to selection. This change is not in response to perceived high slope stability hazard, however, the retention of timber on the slopes further reduces the potential for harvest related mass wasting.

For this evaluation, the harvest unit has been reviewed as three polygon.

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

Geologic Review	Forestry Silviculture/Site Prep Plan	Operational Design Plan
2-1	<p>For reasons other than slope stability hazard, silviculture is now selection targeting the retention of about 100 sq. ft.</p> <p>No site preparation will occur due to partial harvesting.</p>	No change to approved yarding methods.
2-2	<p>For reasons other than slope stability hazard, silviculture is now selection targeting the retention of about 100 sq. ft.</p> <p>No site preparation will occur due to partial harvesting.</p>	No change to approved yarding methods.
2-3	<p>For reasons other than slope stability hazard, silviculture is now selection targeting the retention of about 100 sq. ft.</p> <p>No site preparation will occur due to partial harvesting.</p> <p>The steeply inclined slopes in the western portion of the polygon have been included in the Class II No harvest RMZ.</p> <p>No site preparation.</p>	No change to approved yarding methods.

THP Unit: # 2
Polygon: 2-1

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>The polygon is eye-shaped and located in the northwestern portion of the unit. The northern and southern boundaries are Class II watercourses that converge to the west. The eastern margin of the polygon is a zone of converging Class II Riparian Management Zones (RMZ). The watercourses are moderate to very well entrenched. The slope morphology occurring between the watercourses is broadly convergent and moderately inclined in the east. Inclination increases in the west where adjacent to the convergence of the watercourses.</p> <p>The geometry and varying geomorphic definition of the watercourses suggest a strong structural control likely resulting from dormant faulting.</p> <p>The northern Class II watercourse is moderately well defined with local reaches well entrenched and includes varying gradient inclinations. The watercourse is protected with a 30-foot no harvest buffer adjacent to the creek and a selection harvest buffer that extends to about 75 feet. The retention requirements within the outerband of the watercourse are not drop below 60% canopy closure post harvest.</p> <p>The southern Class II watercourse is very well entrenched and flanked with steep, predominantly planar slopes. The watercourse includes the same protection as the northern Class II watercourse.</p> <p>A broad, gently inclined bench is located where the Class III RMZs overlap in the east. The bench is located at the base of an interfluvial ridge that defines Polygon 2-2.</p> <p>No Class III watercourses exist within the polygon.</p>	<p>The slopes within the unit have experienced clearcut, burning and donkey yarding (a legacy method that dragged the large diameter, felled timber to railroads) during the 1920s.</p> <p>The initial clearcut harvesting during the turn of the century did not appear to significantly reduce slope stability thresholds. This is proven by the lack of historic, harvest related landslides within the polygon.</p> <p>Therefore, the proposed selection harvest should not significantly increase the potential for the development of landslides.</p> <p>The large buffers adjacent to the watercourse should act as a surface impediment to the downslope transfer of sediment / mass wasting.</p> <p>The lack of Class III watercourses suggests that the soils are well drained, therefore reducing the potential to develop significant pore pressures resulting in mass wasting.</p>

<p>A) General Observations</p> <p>Slope inclination within the polygon varies from typically less than 30% in the east to locally over 60% in the west.</p> <p>SHALSTAB modeling within the polygon has identified steeply inclined convergent slopes in the western portion of the polygon. The area registers one pixel of the highest value SHALSTAB within the outerband of the Class II RMZ. Areas registering moderately high convergence and inclination are located further upslope, adjacent to and outside of the southern Class II RMZ.</p> <p>Moderate MWP is modeled for the slopes coincident with the elevated SHALSTAB values in the west. The remainder of the polygon is modeled as low for MWP.</p> <p>No landslides were recorded in the THP during development and agency review.</p> <p>The stand appears to have been cable commercially thinned within the last 10 to 20 years. The stand is predominantly redwood (80%).</p>	<p>B) Harvest Related Impacts and Hillslope Sensitivity</p>
<p>C) Forestry / Silviculture Plan</p> <p>THP approved silviculture was originally clearcut, but has been amended to selection silviculture with a targeted retention of 100 ft² BA/A due to a management change. The watercourses include a no harvest inner band and an outerband that will retain at least 60% canopy closure</p>	<p>D) Operational Design Plan</p> <p>THP approved yarding method for this polygon includes both tractor to the east of the main haul road and cable to the west. The majority of the yarding will be cable in this polygon.</p>

C) Forestry / Silviculture Plan	D) Operational Design Plan
Site preparation has been changed to none.	

THP Unit: # 2

Polygon: 2-2

<p data-bbox="144 397 478 431">A) General Observations</p> <p data-bbox="144 472 1100 654">The polygon is an interfluvial ridge that exists east of Polygon 2-1. Therefore, slope morphology is convex with planar flanking slopes to the south. The polygon is bound to the north by a Class II watercourse, to the south by a Class II watercourse, the west by overlapping RMZs, and to the east by a haul road.</p> <p data-bbox="144 695 1033 805">Slope inclination varies 20 to over 60% with the steeper segments associated with the southwest facing nose of the ridge. The steepest slopes (>60%) are located within the zone of overlapping RMZs.</p> <p data-bbox="144 846 1104 1060">The northern Class II watercourse is located within a poorly to moderately well defined swale. The watercourse is not linear in trend. The watercourse is protected with a 30-foot no harvest buffer adjacent to the creek and a selection harvest buffer that extends to about 75 feet. The retention within the outerband of the watercourse will not decrease canopy closure below 60%.</p> <p data-bbox="144 1101 1079 1282">The southern Class II watercourse is within a more prominently defined and incised channel. The watercourse is protected with a 30-foot no harvest buffer adjacent to the creek and a selection harvest buffer that extends to about 75. The retention within the outerband of the watercourse will result in at least 60% canopy closure post harvest.</p> <p data-bbox="144 1323 890 1354">No Class III watercourses are located within the polygon.</p>	<p data-bbox="1125 397 1818 431">B) Harvest Related Impacts and Hillslope Sensitivity</p> <p data-bbox="1125 472 1902 654">The lack of observed landslides within the polygon suggest that the impacts resulting from the initial clearcut, ground based yarded and burned harvest followed by a ground based commercial thin did not exceed mass wasting thresholds.</p> <p data-bbox="1125 695 1898 805">The portions of the polygon that include elevated values of SHALSTAB are predominantly included within existing RMZs.</p> <p data-bbox="1125 846 1906 987">The areas of concentrated SHALSTAB located outside of existing RMZ protection represent areas of steeply inclined and convergent slopes that may have a higher than expected potential to fail.</p> <p data-bbox="1125 1027 1915 1133">The partial harvesting of the redwood dominated stand is not likely to result in a significant increase in the potential for mass wasting since the stand will sprout.</p>
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<p>A) General Observations</p> <p>Elevated values of SHALSTAB modeled within the unit include one pixel of moderately high convergence and inclination. This area is coincident with a steeply inclined slope that is located within the Class II RMZ.</p> <p>No historic landslides were identified in the polygon during THP preparation and agency review.</p> <p>Skid roads exist within the more gently inclined slopes within the polygon.</p> <p>The stand appears to have been cable commercially thinned within the last 10 to 20 years. The stand is predominantly redwood (80%).</p>	<p>B) Harvest Related Impacts and Hillslope Sensitivity</p>
<p>C) Forestry / Silviculture Plan</p> <p>THP approved silviculture was originally clearcut, but has been amended to selection silviculture with a targeted retention of 100 ft² BA/A due to a management change. The watercourses include a no harvest inner band and an outerband that will retain at least 60% canopy closure</p> <p>Site preparation has been changed to none.</p>	<p>D) Operational Design Plan</p> <p>THP approved yarding method for this polygon includes both tractor or cable. The slopes are gently inclined and not anticipated to fail in response to this harvest.</p>

THP Unit: # 2
Polygon: 2-3

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>The polygon is the southern half of the unit. The polygon essentially represents the flanking slopes of the deep, well defined Class II watercourse that bisects the unit east-west. The slope morphology is nearly planar in the west, transitions through a broad concavity within the central portions of the unit and terminates with planar to convex slope forms in the east. All of the morphologies exhibit rounded edges and transitions. The polygon is bound to the north by a deeply incised Class II watercourse, to the south by an existing haul road that intersect the northern boundary, and to the west at an arbitrary location coincident with the termination of the road. Class III watercourses extend into the unit in the east and west (three total).</p> <p>Slope inclination varies 20 to over 60% with the steeper segments located in the eastern and western portions of the polygon. Slopes inclined greater than 60% define the left bank of the western Class II watercourse. Slopes inclined greater than 60% also occur on a ridge flanking slope in the eastern portion of the polygon.</p> <p>The northern Class II watercourse is located within a well defined, deeply entrenched channel. The watercourse includes a 30-foot no harvest buffer adjacent to the watercourse and an additional 45- to 70-foot selection buffer. The retention for the selection buffer must retain 60% canopy closure post harvest.</p> <p>The Class III watercourse that is located in the western portion of the polygon measures about 300 feet in length. The watercourse is located within a locally occurring, broadly convergent swale. The watercourse protection, as approved in the THP, will retain all channel trees, plus on</p>	<p>The lack of observed landslides within the polygon suggest that the impacts resulting from the initial clearcut, ground based yarded and burned harvest, followed by a ground based commercial thin did not exceed mass wasting thresholds.</p> <p>The portions of the polygon that include elevated values of SHALSTAB located within reasonable distance to watercourses may require additional mitigations.</p> <p>The partial harvesting of the redwood dominated stand is not likely to result in a significant increase in the potential for mass wasting since the stand will sprout.</p>

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>side slopes greater than 50% employ a 50' RMZ that maintains 75 sq. ft evenly distributed in the buffer. Where side slopes are less than 50% employ a 25' RMZ that maintains 75 sq. ft evenly distributed in the buffer, Headwall Swales need to maintain at least 50% canopy, and no group opening greater than ¼ acre immediately above the terminus of class III with slopes greater than 40% or immediately above a headwall swale. Additionally sub-merchantable trees and those with specific wildlife value characteristics (e.g., cavities, large limbs, broken tops, snags, etc.) will be retained within the harvest area to the extent feasible. The watercourse is also within an equipment exclusion zone prohibiting tractor use within 50 feet of the watercourse.</p> <p>The Class III watercourse that is located in the eastern portion of the polygon is located within a moderately defined swale. The watercourse measures about 200 feet in length.</p> <p>A Class III watercourse is located to the west of the eastern Class III watercourse. The watercourse occurs within a slightly more defined channel than to the east. The watercourse measures about 300 feet in length.</p> <p>Elevated values of SHALSTAB are modeled within the western corner of the unit adjacent to the Class II watercourse, adjacent to and downslope of the road (southern and western boundary) and upslope and adjacent to the Class II watercourse in the eastern portion of the polygon. The elevated values of SHALSTAB that concern us are located in the west upslope of the Class II watercourse, upslope of the western Class III watercourse and upslope of the eastern Class II, including the Class III watercourse. These areas are of marginal concern due to the close distance between the modeled location and the watercourses. The remaining areas of modeled SHALSTAB exist in distances greater than</p>	

<p>A) General Observations</p> <p>400 feet from the watercourses.</p> <p>Mass Wasting Potential (MWP) for the polygon has been modeled as high in the western portion of the polygon. The area is encompassed with a ring of moderate MWP. The remainder of the polygon is modeled with low MWP.</p> <p>No historic landslides were identified in the polygon during THP preparation and agency review.</p> <p>Skid roads exist within the more gently inclined slopes within the polygon.</p>	<p>B) Harvest Related Impacts and Hillslope Sensitivity</p>
<p>C) Forestry / Silviculture Plan</p> <p>THP approved silviculture was originally clearcut, but has been amended to selection silviculture with a targeted retention of 100 ft² BA/A due to a management change. The typical Class II watercourses include a no harvest inner band and an outerband that will retain at least 60% canopy closure.</p> <p>The watercourse buffer along the Class II watercourse located in the western corner of the polygon has been extended in length from the creek and converted to a no harvest. This places all of the adjacent high value SHALSTAB within a no harvest zone.</p> <p>The Class III watercourses will retain all channel trees, plus on side slopes greater than 50% employ a 50' RMZ that maintains 75 sq. ft</p>	<p>D) Operational Design Plan</p> <p>As approved in the THP, the area downslope of the bisecting road is proposed for cable. The gentle to moderately inclined slopes central to the polygon are proposed as a tractor / cable option, and the easternmost portion of the polygon is proposed as cable yarded. This is acceptable since the ground based operations will occur on slopes typically less than 30 % and the adjacent watercourse is within a 50-foot buffer.</p>

C) Forestry / Silviculture Plan	D) Operational Design Plan
<p>evenly distributed in the buffer. Where side slopes are less than 50% employ a 25' RMZ that maintains 75 sq. ft evenly distributed in the buffer, Headwall Swales need to maintain at least 50% canopy, and no group opening greater than ¼ acre immediately above the terminus of class III with slopes greater than 40% or immediately above a headwall swale. Additionally sub-merchantable trees and those with specific wildlife value characteristics (e.g., cavities, large limbs, broken tops, snags, etc.) will be retained within the harvest area to the extent feasible. The watercourse is also within an equipment exclusion zone prohibiting tractor use within 50 feet of the watercourse.</p> <p>Site preparation has been changed to none.</p>	

References:

CGS, 1999, Geology and Geomorphic Features Related to Landsliding, Freshwater Creek, Humboldt County, California, DGM OFR 99-10, dated 1999. http://redirect.conservation.ca.gov/CGS/information/publications/database/Publications_year.asp

HRC, 2008, Freshwater Creek and Elk River WDR Permit Acreage Enrollment and Compliance 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.

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>

HRC, 2007, Ortho-photo rectified aerial photographs flown by 3Di West, Eugene Oregon,

PALCO, 1999, Habitat Conservation Plan, Vol. 2 Part D, Landscape Assessment of Geomorphic Sensitivity, Public Review Draft.

Watershed Professionals Network (WPN), 2001, Freshwater Creek Watershed Analysis, Appendix A, Map A-5

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. 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.

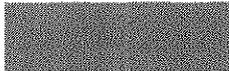
Table 1. Proposed 2009 Harvest in Freshwater Creek

THP Name	THP Number	Unit Number	Silviculture				CC Equivalent	Hazard	
			CC	ROW	CT	SEL		Low	High*
Little 34	08-048	1				22.4	11.2	22.4	0.0
Little 34	08-048	3				30.3	15.2	27.4	10.8
McCready Ridge	07-132	1	0	0	0	15.6	7.8	15.6	0.0
McCready Ridge	07-132	2	0	0	0	15	7.5	13.1	7.3
Around gills	05-077	4		3.1		36.2	21.2	38.6	2.7
Mid Incline	05-123	1		0.4		26.2	13.5	4.8	83.7
Mid Incline	05-123	2				31.5	15.8	31.5	0.0
Mid Incline	05-123	3				28.7	14.4	24.4	16.4
Fresh 1	04-242	2				36.1	18.1	34.3	6.9
Fresh 1	04-242	3				27.4	13.7	27.1	1.2
Little Fresh	05-176	1				36.3	18.2	30.1	23.8
Little Fresh	05-176	2				20	10.0	12.4	29.2
Little Fresh	05-176	3				5.7	2.9	5.7	0
Little Fresh	05-176	5				39.6	19.8	39.6	0.0
Little Main	05-085	2				29.7	14.9	14.3	59.1
Little Main	05-085	3				25.3	12.7	16	35.7
Little Main	05-085	7				33.3	16.7	19.5	53.0
Whiskey	08-041	1				20.9	10.5	20.6	1.2
Whiskey	08-041	2				23.5	11.8	23.2	1.2
Whiskey	08-041	3				35.4	17.7	29.6	22.4
Whiskey	08-041	4				32	16.0	32	0.0
Whiskey	08-041	5				11.3	5.7	9.5	6.9
						Total	294.7		

*The acres represented here have been converted to High Hazard Acres by multiplying by 3.8404.

Highlight indicates a THP and Specific Unit to be enrolled prior to establishing an enforceable Zero Discharge Monitoring Plan (Tier I). Weighted Acreage Totals are listed below to demonstrate compliance with the Staff Landslide Model limit of 144 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).



Indicates tier 1 for ROW and tier 2 for remainder of the unit

Total Clear Cut Equivalent Acres enrolled or submitted for enrollment	145.1
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Table 2. Summary of THPs to enrolled prior to establishment of Zero Discharge Monitoring Plan for Freshwater Creek

THP Number	Unit Number	Harvest Acres	Hazard	
			Low	High*
08-048	1	22.4	22.4	0.0
05-077	4	3.1	3.1	0.0
05-176	5	39.6	39.6	0.0
08-041	1	20.9	20.6	1.2
08-041	2	23.5	23.2	1.2
08-041	4	32.0	32	0.0
Totals		141.5	143.3	

Table 3. Summary of THPs by Yarding System and Site Preparation for Freshwater Creek

THP Name	THP Number	Unit Number	Yarding System			Site Preparation	
			Ground Based	Yarder	Helicopter	Mechanical	Broadcast
Little 34	08-048	1	3.9	18.5			
Little 34	08-048	3	6.9	23.4			
McCready Ridge	07-132	1	0	15.6			
McCready Ridge	07-132	2	10.1	4.9			
Around gills	05-077	4	17.7	20.5			
Mid Incline	05-123	1	0	26.2			
Mid Incline	05-123	2	11.5	23			
Mid Incline	05-123	3	0	28.7			
Fresh 1	04-242	2	10.9	25.2			
Fresh 1	04-242	3	0	27.4			
Little Fresh	05-176	1	0	36.3			
Little Fresh	05-176	2	7.3	12.7			
Little Fresh	05-176	3	0	5.7			
Little Fresh	05-176	5	0	39.6			
Little Main	05-085	2	0	29.7			
Little Main	05-085	3	0	25.3			
Little Main	05-085	7	0	33.3			
Whiskey	08-041	1	20.9	0			
Whiskey	08-041	2	11.7	11.8			
Whiskey	08-041	3	9.3	26.1			
Whiskey	08-041	4	19	13			
Whiskey	08-041	5	0	11.3			

Humboldt Redwood Co. LLC

Erosion Control Plan (ECP) for
the “Fresh 1” THP

1-04-242HUM

Updated ECP – for purpose of identifying **Tier 2** erosion control sites specific to units 2 & 3 (2009 enrollment requests); site G51 (Road X65.44) and site G59.5 (Road X65.4486) are erosion control sites located on the spur road system leading specifically to These unit.

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 **20080226**

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. R1-2006-0041 (Freshwater Creek) 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 Co. LLC P.O. Box 712 Scotia, CA 95565 (707) 764-2330.

This ECP is submitted for: THP Name: **Fresh 1**
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. R1-2006-0041 (Freshwater Creek).

"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. R1-2006-0041 (Freshwater Creek)

Highest priority is assigned to the largest sediment discharge sources that discharge to waters that support domestic water supplies or fish. HRC'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 HRC 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 reconstruction 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:

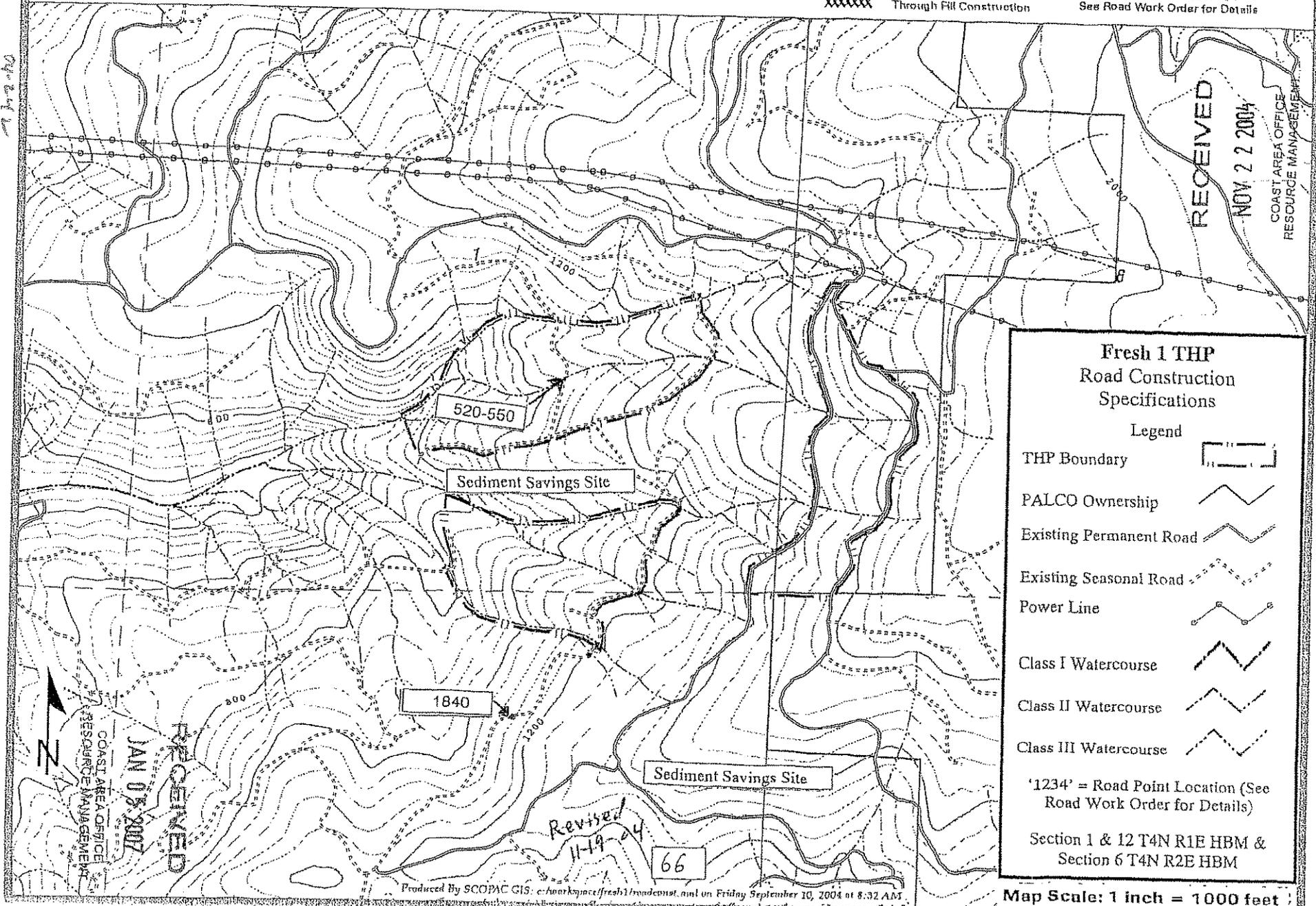
- ECP Site Locator Map

Fresh 1 Road Construction Specifications

Data as of September 10, 2004

PART OF PLAN

- ▣▣▣▣ Full Bench Construction
- ▤▤▤▤ Cut and Fill Construction
1/2 Cut and 1/2 Fill
- XXXXXX Through Fill Construction
- Keyway Construction
Fill Bottom-up Compaction
- "777" Road Point Location
See Road Work Order for Details



**Fresh 1 THP
Road Construction
Specifications**

Legend

- THP Boundary
- PALCO Ownership
- Existing Permanent Road
- Existing Seasonal Road
- Power Line
- Class I Watercourse
- Class II Watercourse
- Class III Watercourse

'1234' = Road Point Location (See Road Work Order for Details)

Section 1 & 12 T4N R1E HBM & Section 6 T4N R2E HBM

Map Scale: 1 inch = 1000 feet

Produced by SCOPAC GIS: c:\workspace\fresh1\roadconst.mxd on Friday September 10, 2004 at 8:32 AM

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RESOURCE MANAGEMENT

III Inspection Plan and Reporting Requirements

A. Inspection Plan

The Inspection Plan is designed to ensure that all required management measures are installed and functioning prior to rainfall events; that the management measures are effective in controlling sediment discharge sources throughout the winter period; and that no new controllable sediment discharge sources developed.

- B. Qualified and trained professionals will conduct all specified inspections of the project site to identify areas causing or contributing to a violation of the applicable water quality requirements or other provisions of these WWDRs. The responsible party for inspection and reporting is **Mike Miles (707) 764-4173**.
- C. No inspections are required in Project Areas where Timber Harvest Activities have not yet commenced.
- D. Project Areas where Timber Harvest Activities have commenced and no winter period Timber Harvest Activities have occurred inspections will be conducted each year and throughout the duration of the Project while Timber Harvest Activities occur.
- a. The Project is covered under WWDRs and the following inspection requirements will begin at the startup of timber harvest activities within the Project area:
- i. By November 15 to assure Project Areas are secure for the winter period;
 - ii. Once following ten (10) inches of cumulative rainfall commencing on November 15 and prior to March 1, as worker safety and access allows; and
 - iii. After April 1 and before June 15 to assess the effectiveness of management measures designed to address controllable sediment discharges and to determine if any new controllable sediment discharges sources have developed.
- b. Project Areas with Winter Period Timber Harvest Activities will conduct inspections of such Project Areas while Timber Harvesting Activities occur and the Project is covered under the WWDRs as follows:
- i. Immediately following cessation of winter period Timber Harvest Activities to assure areas with winter Timber Harvest Activities are secure for the winter;
 - ii. Once following ten (10) inches of cumulative rainfall commencing on November 15 and prior to March 1, as worker safety and access allows; and
 - iii. After April 1 and before June 15 to assess the effectiveness of management measures designed to address controllable sediment discharges and to determine if any new controllable sediment discharges sources have developed.
- c. Inspection reports will identify where management measures have been ineffective and when repairs and design changes will be implemented to correct management measure failures.
- d. After completing the required inspections, and when it has been determined new controllable sediment discharges sources have developed, the ECP, implementation schedule, and inspection plan will be updated, if required, consistent with the WWDRs and submit the updated documents to the Regional Water Board to maintain coverage under the WWDRs. If the approved amendment is found to be out of compliance with the WWDRs, the Project will be amended to be consistent with the provisions of the WWDR within 30 days, or coverage under the WWDRs will be terminated. The Project will then be required to seek Project coverage under an individual WDR.
- e. Equipment, materials, and workers will be available for rapid response to failures and emergencies, implement, as feasible, emergency management measures depending upon field conditions and worker safety for access.

- D. If during the inspection or during the course of conducting timber harvest activities, a violation of an applicable water quality requirement or conditions of WWDRs is discovered, the following procedures will be followed:
- a. When it has been determined that discharges are causing or contributing to a violation or an exceedence of an applicable water quality requirement or a violation of a WWDR prohibition:
 - i. Corrective measures will be implemented immediately following the discovery that applicable water quality requirements were exceeded or a prohibition violated, followed by notification to the Regional Board by telephone as soon as possible but no later than 48 hours after the discharge has been discovered. The notification will be followed by a report within 14 days to the Regional Board, unless otherwise directed by the Executive Officer, that includes:
 1. the date the violation was discovered;
 2. the name and title of the person(s) discovering the violation;
 3. a map showing the location of the violation site;
 4. a description of recent weather conditions prior to discovering the violation;
 5. the nature and cause of the water quality requirement violation or exceedence or WWDR prohibition violation;
 6. photos of the site characterizing the violation;
 7. the management measure(s) currently being implemented;
 8. any maintenance or repair of management measures;
 9. any additional management measures which will be implemented to prevent or reduce discharges that are causing or contributing to the violation or exceedence of applicable water quality requirements or WWDR prohibition violation; and,
 10. The signature and title of the person preparing the report.
 11. The report will include an implementation schedule for corrective actions and describe the actions taken to reduce the discharges causing or contributing to violation or exceedence of applicable water quality requirements or WWDR prohibition violation.
- E. For other inspections conducted where violations are not discovered, a summary report will be submitted to Executive Officer by June 30th for each year of coverage under the WWDRs or upon termination of coverage. The summary report, at a minimum will include the date of inspections, the inspector's name, the location of each inspection, and the title and name of the person submitting the summary report.

If helicopter operations are proposed for this project, please find attached a Columbia Helicopters, Inc. (CHI) Fuel Spill Prevention and Cleanup Plan For Columbia Helicopters Field Operations.

Explanation of Information Included in the Controllable Sediment Sources Table	
Column Heading	Explanation
Site No.	Site identification unique to project area
Site Type	A description of the existing site. Example: Humboldt Crossing; Culvert Crossing; Unstable Fill; Unstable Cut Slope; Diversion Potential.
Estimate of Potential Erosion	A quantitative estimate of the volume, in cubic yards, of the total amount of potential erosion/displacement of soil that will occur should the site entirely fail. PALCO often uses a methodology developed by Pacific Watershed Associates to estimate erosion, which assumes 100% delivery of calculated volume—use of this method for individual sites is noted in Site Description.
Potential Sediment Delivery Percent	An estimate of the relative potential for sediment delivery expressed as a percent of the total amount of Potential Erosion that will be discharged to waters of the State should the site fail.
Sediment Prevention Volume	The volume, in cubic yards, of sediment discharge estimated to be prevented by implementation of the prescribed treatment. Volume represents the Estimate of Potential Erosion multiplied by the Potential Sediment Delivery Percent.
Priority for Treatment	Treatment priority reflects the immediacy of sediment discharge and the relative risk to the receptor, should the site fail. Low priority sites are ones that will not likely deliver significant amounts of sediment during the life of the WWDR permit, and will be treated prior to filing of THP work completion report, which does not exceed 5-years following THP approval date. Medium or high priority sites indicate potentially imminent discharge, and the timing of treatment is indicated in Implementation Schedule column.
Implementation Schedule	Indicates the timing of implementing the prevention and minimization measures listed in the Treatment column.
Site Description	Provides sufficient information that describes the existing condition of the site and factors that inform the chosen treatment methods and implementation schedule. This information will include a description of how the existing condition of the site (ie. stable or unstable) will be affected by different storm events, and whether sediment discharge is imminent. For example, an unstable site could easily discharge significant amounts of sediment in a small storm, thus the treatment priority should be higher. Conversely, a stable site that may take one or more very large storms to trigger discharge could be lower treatment priority. If PWA method is used to calculate erosion/delivery volumes, it will noted here.
Treatment	Sediment discharge prevention and minimization measures that will be implemented at the site, including treatment specifications if necessary.

Attachments:

- ECP Table

Erosion Control Plan

Site	Site Type	Est. Potential Erosion (Cu.Yards)	Est. Potential Delivery (Cu.Yards & %)	Priority for Treatment	Implementation Schedule	Site Description	Treatment
Project fresh 1							
Rd X65.44 Station 1840 Site G51 ID 1978998227	Culvert Maintenance	67	67 100%	Med	Prior to THP Final Completion.	Plugged culvert, clean CMP outlet.	Clean CMP outlet.
Rd X65.4486 Station 520 Site G59.5 ID -1026592463	Failing Fill	265	265 100%	Low	Prior to THP Final Completion.	Excavate unstable fill.	Excavate unstable fill.
Total Estimated Yard		332	332				

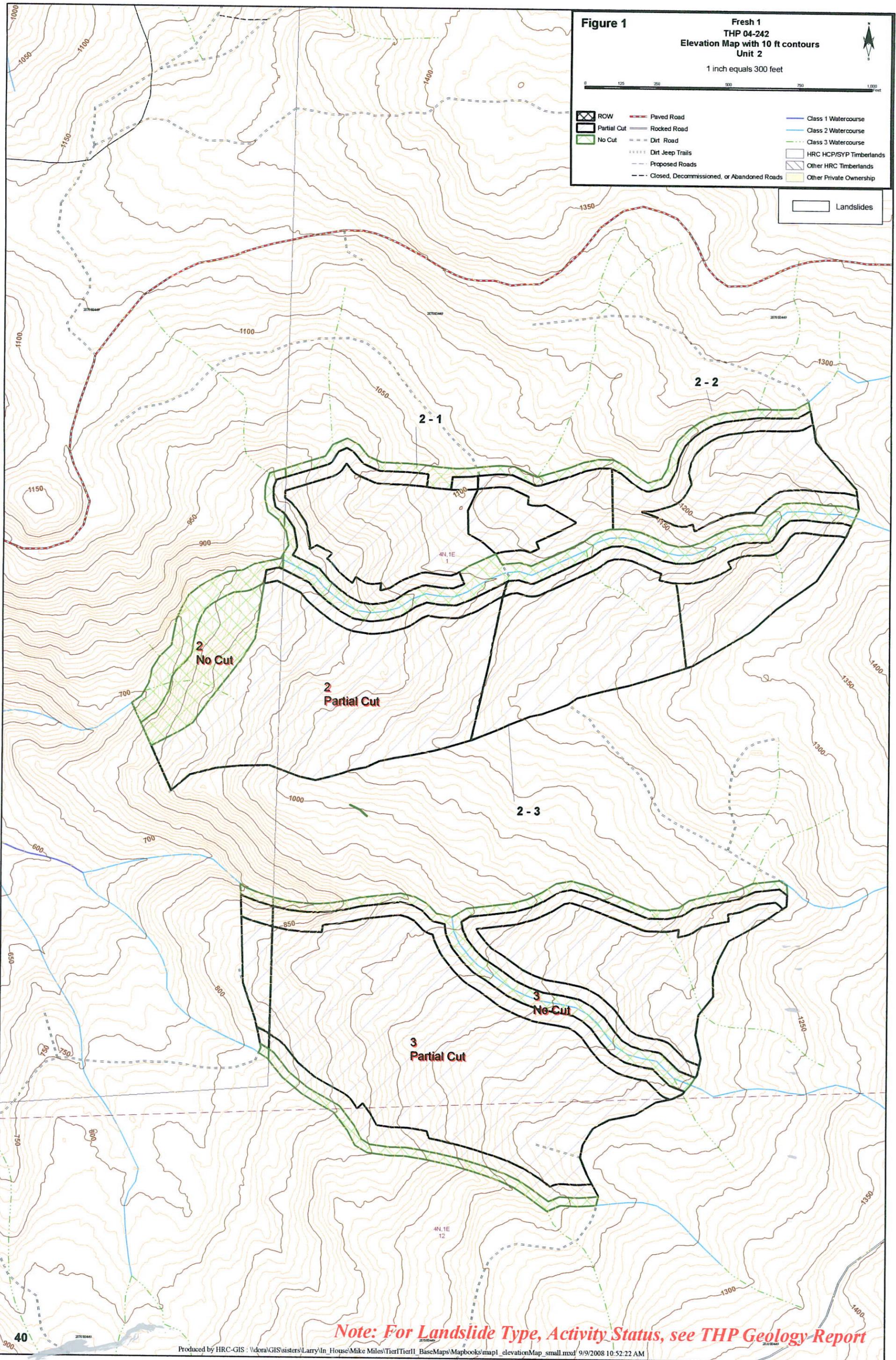
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Figure 1

Fresh 1
THP 04-242
Elevation Map with 10 ft contours
Unit 2

1 inch equals 300 feet

- ROW
- Partial Cut
- No Cut
- Paved Road
- Rocked Road
- Dirt Road
- Dirt Jeep Trails
- Proposed Roads
- Closed, Decommissioned, or Abandoned Roads
- Class 1 Watercourse
- Class 2 Watercourse
- Class 3 Watercourse
- HRC HCP/SYP Timberlands
- Other HRC Timberlands
- Other Private Ownership
- Landslides



Note: For Landslide Type, Activity Status, see THP Geology Report

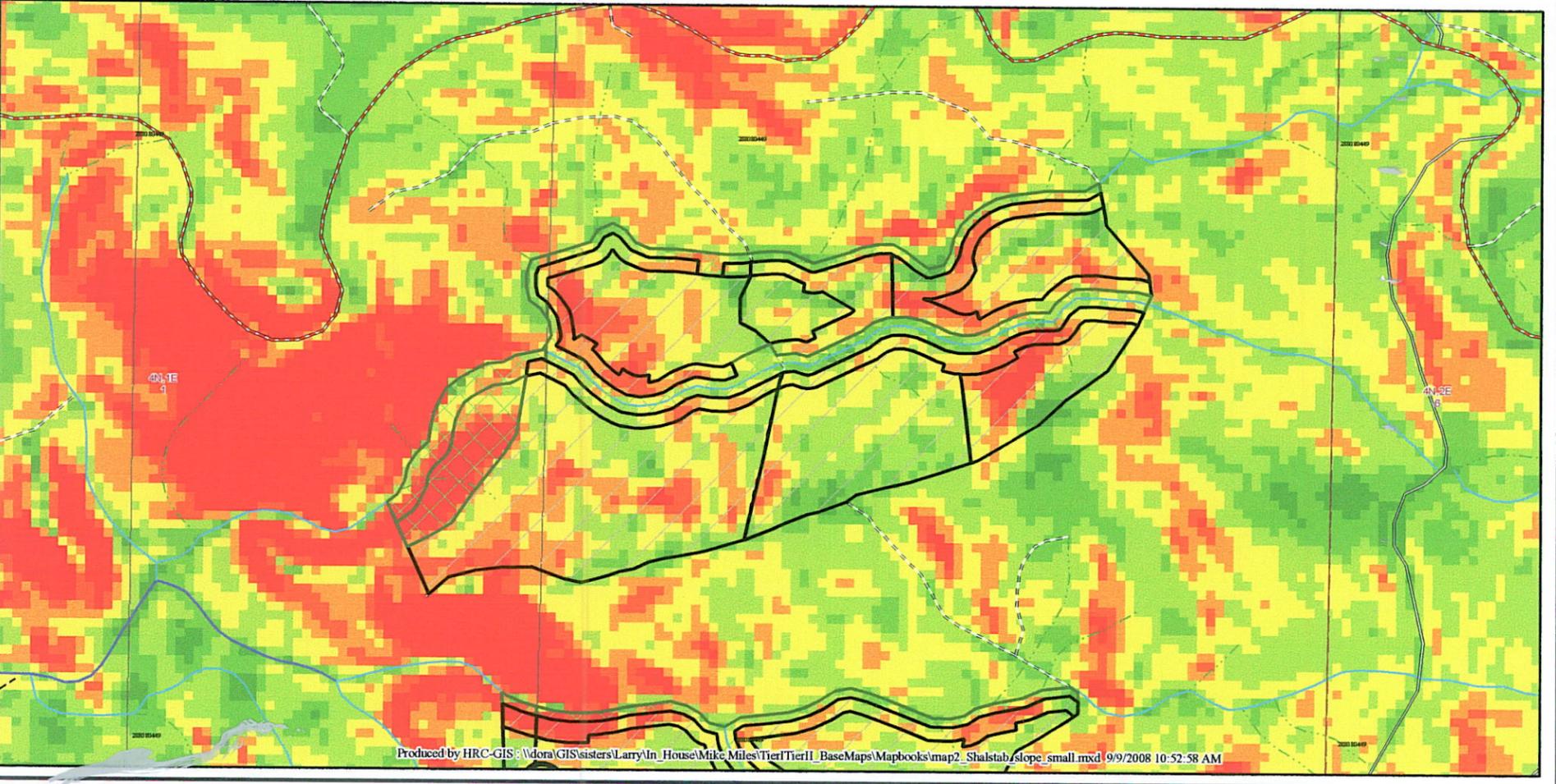
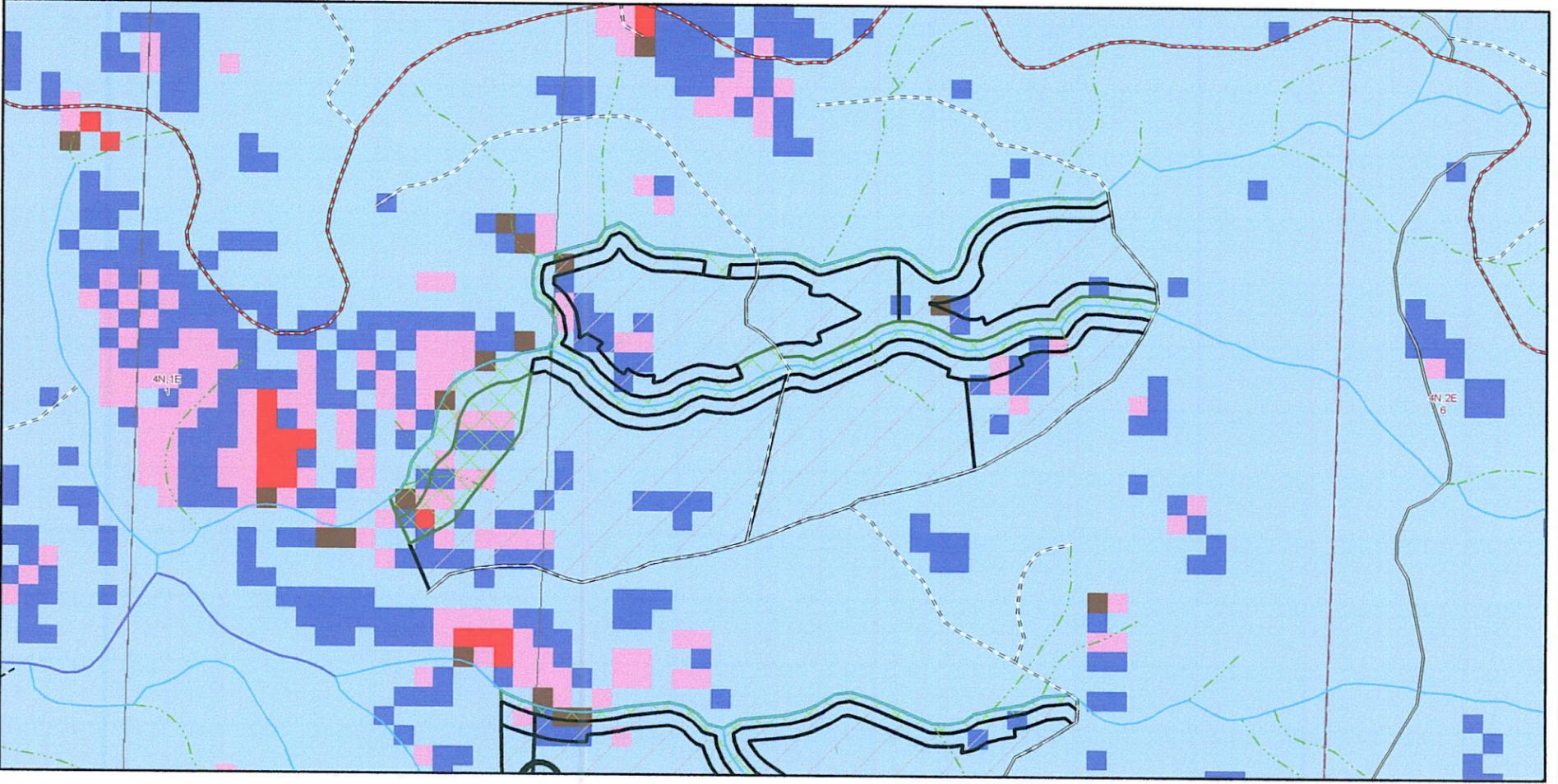
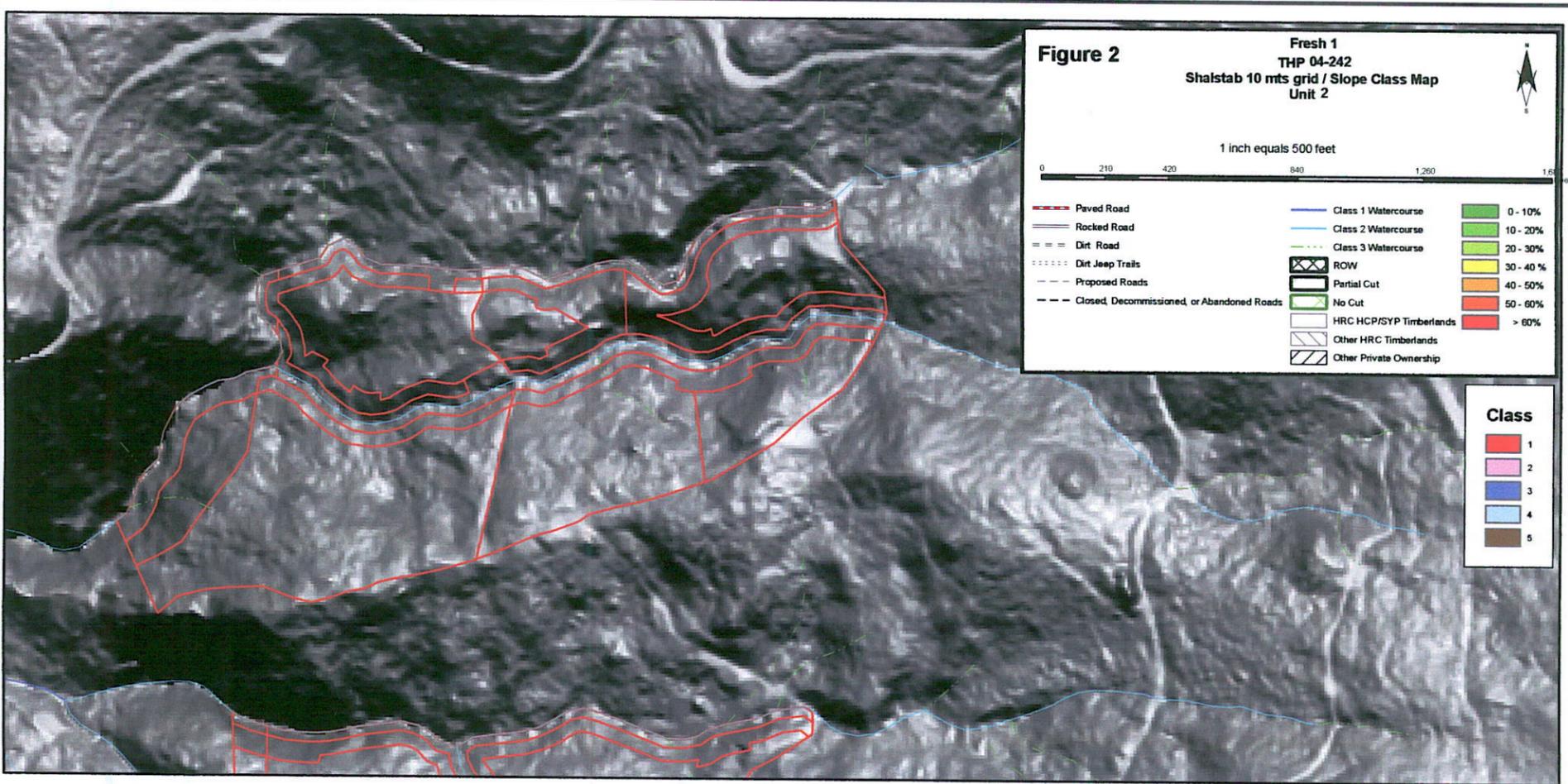
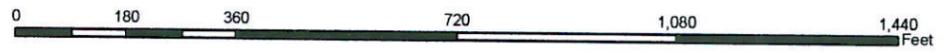


Figure 3

Fresh 1
THP 04-242
CGS Map Unit 2

1 inch equals 300 feet



- | | | | |
|-------------------------|-------------|--|---------------------|
| HRC HCP/SYP Timberlands | ROW | Paved Road | Class 1 Watercourse |
| Other HRC Timberlands | Partial Cut | Rocked Road | Class 2 Watercourse |
| Other Private Ownership | No Cut | Dirt Road | Class 3 Watercourse |
| | | Dirt Jeep Trails | |
| | | Proposed Roads | |
| | | Closed, Decommissioned, or Abandoned Roads | |

Legend

CGS Freshwater structure

FEATURE

- anticline, approx. loc.
- fault, approx. loc.
- fault, concealed
- thrust fault, approx. loc.
- thrust fault, concealed
- thrust fault, queried
- lineament

CGS Freshwater lines

TYPE

- ig
- tt

CGS Freshwater LS

INIT_TYPE, ACTIVITY

- df, h
- ds, d
- ds, h
- ef, d
- ef, h
- rs, d
- rs, h
- dss,

CGS Freshwater symbols

<all other values>

ACTIVITY

- ah
- d

CGS Freshwater geology

UNIT

- KJfm
- KJfs
- Q
- Qfa?
- Qrt
- Twf
- Twf?
- Twu
- Ty
- Ty?
- u

CGS Freshwater contacts

CONTACT

- approximately located
- certain location
- queried location

Gulch

Figure 4

Fresh 1
THP 04-242
Mass Wasting Potential
Unit 2

1 inch equals 300 feet



- | | | | |
|-------------------------|---------------------------|--|---|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road | Potential
Very Low
Low
Moderate
High
Very High
Extreme |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road | |
| Other Private Ownership | Class 3 Watercourse | Dirt Road | |
| ROW | DS & Amphitreatre / Slope | Dirt Jeep Trails | |
| Partial Cut | Proposed Roads | Closed, Decommissioned, or Abandoned Roads | |
| No Cut | | | |

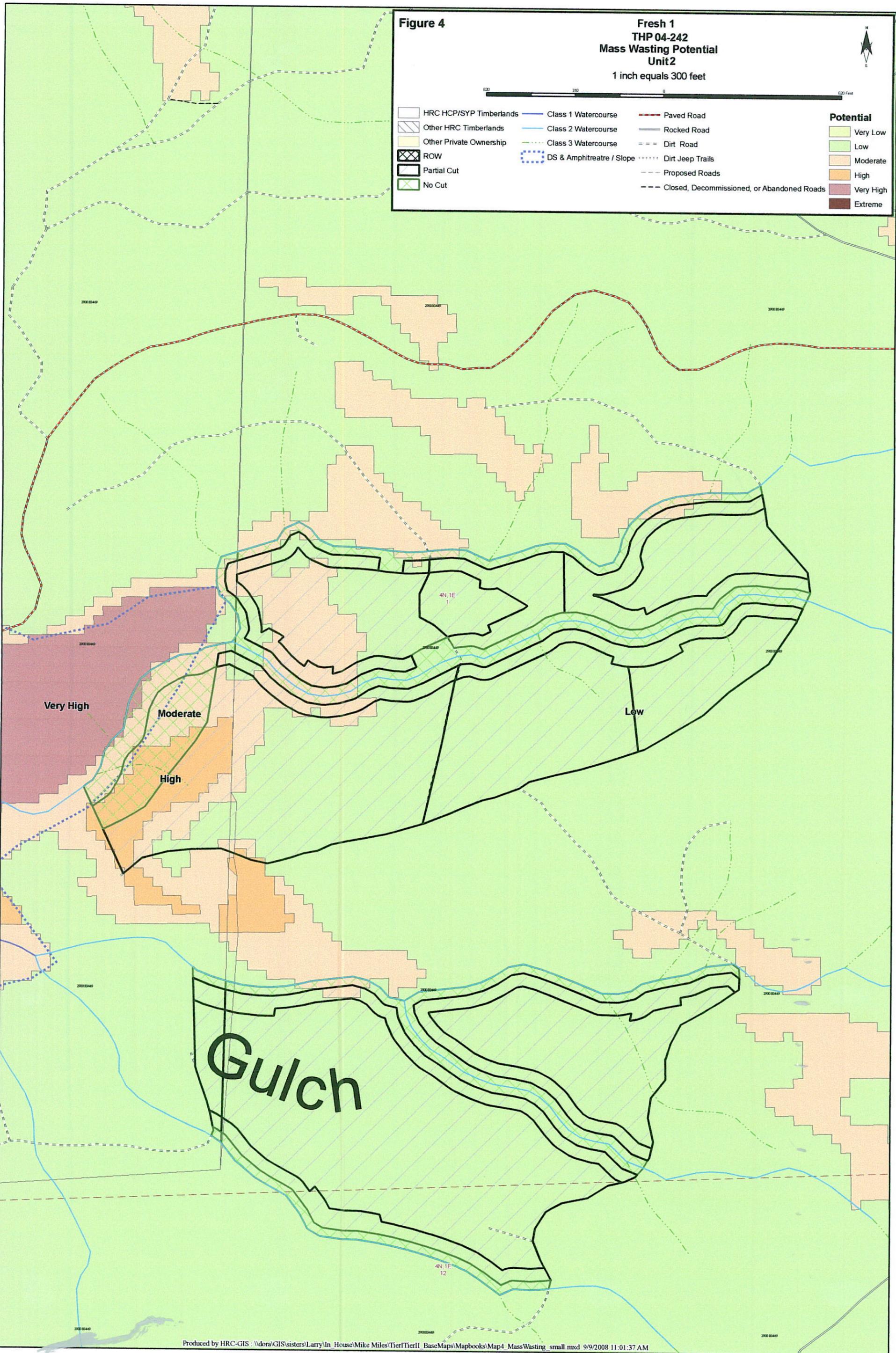
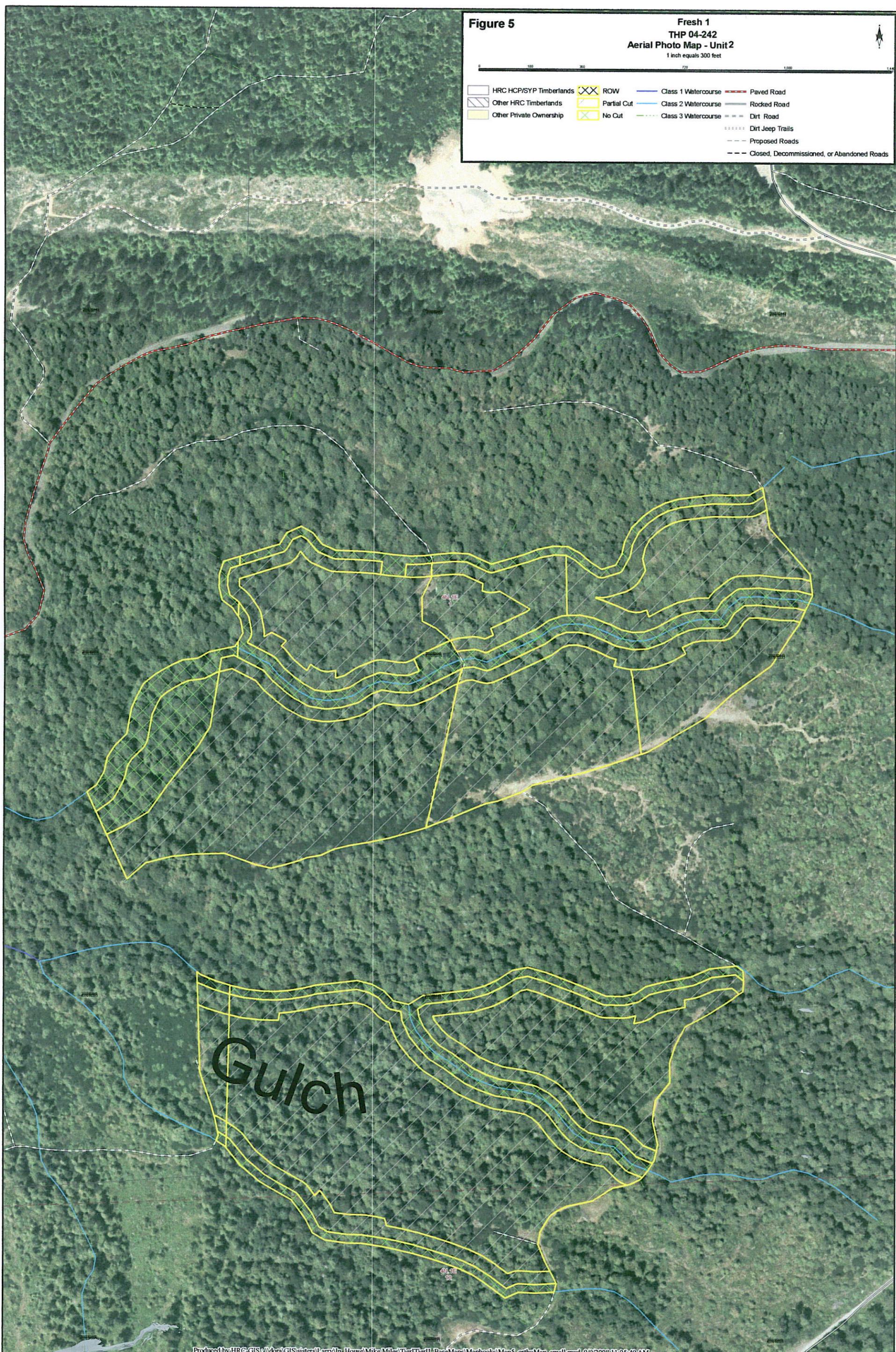
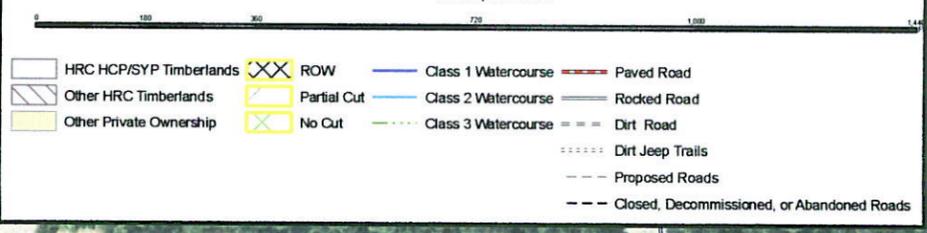


Figure 5

Fresh 1
THP 04-242
Aerial Photo Map - Unit 2
1 inch equals 300 feet

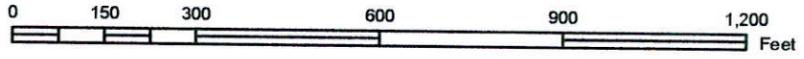


Gulch

Figure 6

THP 04-242 Watershed Analysis Deep-Seated Landslide Inventory Unit 2

1 inch equals 300 feet



- | | | |
|-------------------------|---------------------|--|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road |
| Other Private Ownership | Class 3 Watercourse | Dirt Road |
| ROW | | Dirt Jeep Trails |
| Partial Cut | | Proposed Roads |
| No Cut | | Closed, Decommissioned, or Abandoned Roads |

- Crown of Deep-Seated Landslides
- #### Hazard for Reactivation or Acceleration of Movement REACT_HAZARD
- | | |
|--|-------------------------------------|
| | N/A (landslides in grassland areas) |
| | Very Low |
| | Low |
| | Low to Moderate |
| | Moderate |
| | High |

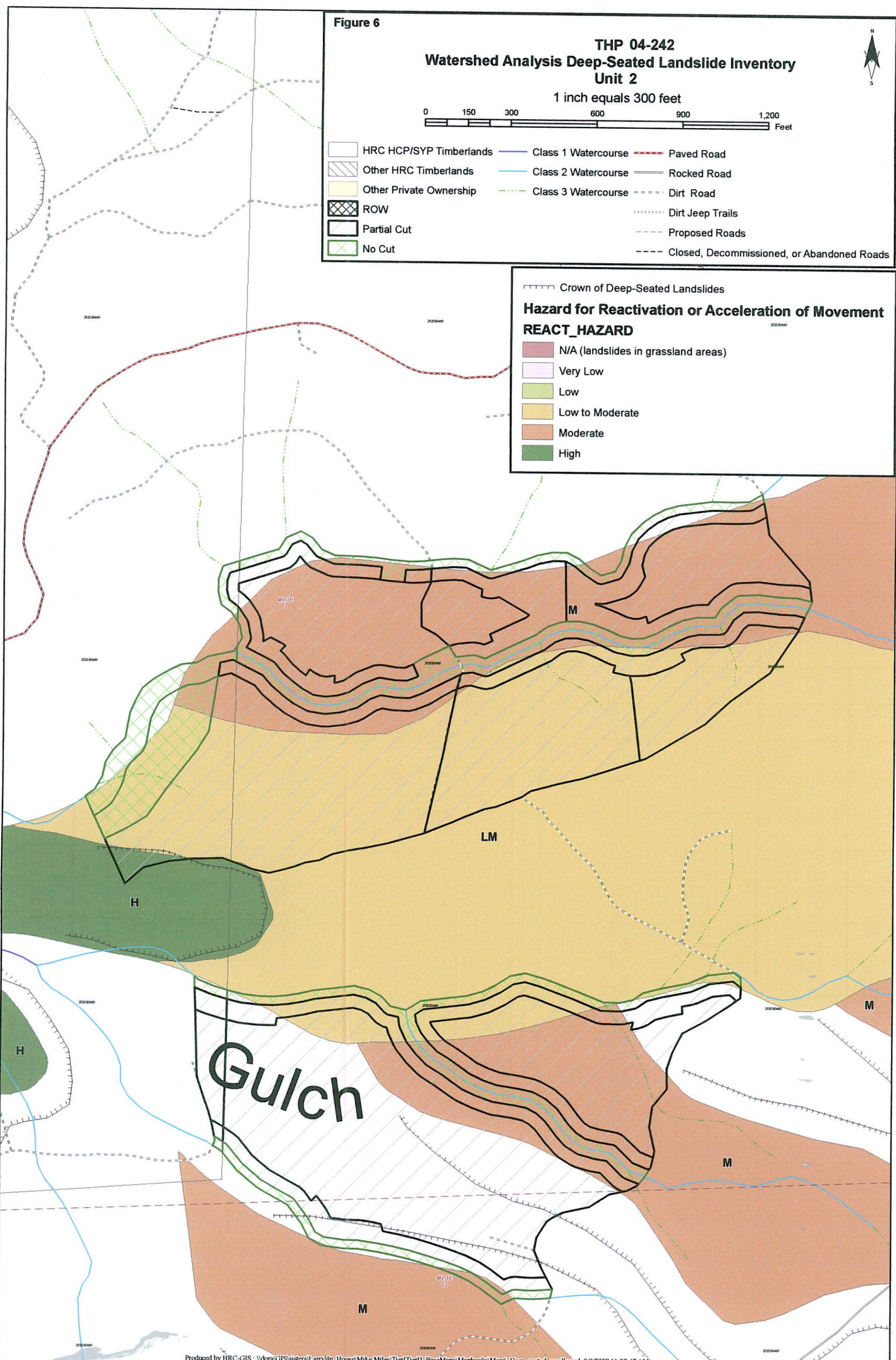
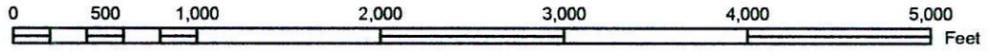


Figure 7

Fresh 1
THP 04-242
Road Map

1 inch equals 1,000 feet



- | | | | |
|-------------------------|--|----------------|----------------|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road | Stormproofed |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road | Upgraded |
| Other Private Ownership | Class 3 Watercourse | Dirt Road | Decommissioned |
| ROW | Dirt Jeep Trails | Proposed Roads | |
| Partial Cut | Closed, Decommissioned, or Abandoned Roads | | |
| No Cut | | | |

