Humboldt Redwood
COMPANY, LLC

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February 15th, 2011

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 1-08-041 HUM 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 THP 1-08-041HUM for units 1, 4 and 5 and portions of units 2 and 3. The enrollment is comprised of 85.6 acres of group selection/selection, (42.8 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. 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.

The Whiskey THP consists of 5 small acreage units that were originally proposed as clear cut units. The silviculture has been amended to partial cut due to new timberlands management. Four of the five units are underlain by undifferentiated Wildcat Group sediments that are comprised of consolidated silts, clays, and fined grained sands. Unit 4 is underlain by mélange which is a clay matrix supported assemblage of clasts of varying lithologies. Mass wasting associated with the initial and subsequent thinning harvests appears minimal. The lack of past mass wasting viewed in the THP resulted in omitting a note 45 report. Since the mass wasting response to the initial clear cut harvest was minimal, we anticipate that the proposed partial harvest with significant watercourse buffers and adapted yarding methods that limit the potential for ground surface alteration to a minimum to be low landslide risk activity. As such, it is our opinion that this harvest plan meets the requirements for tier II enrollment.

The THP proposes an uneven-age silviculture retaining 75 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 and ground based yarding is approved for the 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,

Jon Woessner,
Area Manager RPF #2571
Humboldt Redwood Company, LLC

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

Humboldt Redwood
COMPANY, LLC

THP: Whiskey THP 08-041 Units 1-5 February 11, 2011

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, 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 (HRC, 2004)	6
Road Condition Map	7

Please see back of enrollment for references

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

Geologic Review	Forestry Silviculture/Site Prep Plan	Operational Design Plan
All Units	THP approved silviculture is group selection. No site preparation will occur due to partial harvesting.	The approved THP proposes ground based yarding in portions of Units 1, 2, 3, and 4 where slope inclinations are moderate to gentle. Cable yarding is approved on steep slopes in Units 2, 3, 4, and 5. No change to approved yarding methods.

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

The THP did not include a Note 45 Geology report because no potentially unstable areas were observed within the operational portions of the THP during field review. The THP does include a Review of Geologic Information and Disclosure of CLFA (1999) Potentially Unstable Areas. For a comprehensive review of the geology associated with this harvest unit, please see Section 5 of the THP. This review is a brief summary of the previous geologic mapping in the THP area.

The units are located on north and south facing slopes that drain to Graham Gulch and Freshwater Creek respectively. Slope forms within the units range from convergent swales containing watercourses to divergent interfluvial ridges. The numerous watercourses that extend into the units are typically well defined.

Figure 3 shows four of the units to be underlain by the lower Wildcat Group sediments and Unit 4 underlain by Franciscan Melange. The lower Wildcat Group sediments are composed of interbedded mudstone, silty, very fine sandstone and sandy siltstone with occasional pebble and conglomerate lenses. The Franciscan Melange is characterized as a highly sheared shale matrix containing individual blocks of greywacke, mudstone, conglomerate, greenstone, chert, blueschist, greenschist, actinolite, talc and serpentinite. Nearly all of the moderate to steeply inclined slopes within the unit are mapped a debris slide slopes / source areas. Very large, deep-seated, dormant landslides are mapped within the plan area. Features that characterize the dormant, deep-seated landslides are highly weathered and not clearly defined in the field.

Figure 6 shows areas of deep-seated mass wasting within the units that correlate with landslides mapped in Figure 3. The hazard for reactivation or acceleration of movement was evaluated for watershed analysis deep-seated landslide inventory. Within the plan area watershed analysis determined low and low/moderate reactivation hazard within the units.

Figure 4 models low to moderate Mass Wasting Potential (MWP) throughout the majority of the operational portions of the plan. An area of high MWP is modeled in Unit 3. During field review we observed no evidence of potentially unstable slopes in the area modeled as high MWP.

Figure 2 (Hillslope shade) reveals shadows indicative of consistent and even weathering of the slopes within the unit. The transition from flanking slopes to the ridge-top is sharp and distinct. Segments of the truck roads are easily observed.

The area has been previously clearcut and ground-based logged with steam donkeys and bulldozers. Significant ground disturbance is

observable throughout the unit in response to past harvest practices. The most recent harvesting occurred under the HCP and consisted of clear cuts and selections using largely cable and helicopter yarding with large stream buffers. The landscape mass wasting response to this harvest entry appears to be significantly reduced by these harvest methods and significant areas of concentrated ground disturbance are not visible.

THP Units 1-5

A) General Observations

The entire plan is to be enrolled as Tier II acres with the exception of the western portion of Unit 2 and the northern portion of Unit 3. These areas have been designated as Tier I acres.

No Class I watercourse Riparian Management Zones are part of the plan.

Riparian Management Zones for the Class II watercourses includes a 30-foot no harvest inner band and a selection buffer that extends the RMZ out to between 50 and 100 feet dependent on slope gradient. The outer band may be harvested but must retain a minimum of 60% canopy closure. The Class II no harvest zones have been expanded in many locations to exclude potentially unstable slopes from the operational portions of the units.

The implemented THP mitigations for the Class III watercourses include the retention of all trees growing within the active channel and all trees 8 inches and less within 15 feet of the channel. Where channel side-slopes are greater than 50%, a 100' RMZ has been established and maintaining 75 sq. ft (or the proposed retention standard if greater) evenly distributed in the buffer. Where side-slopes are less than 50% a 50' RMZ that maintains 75 sq. ft (or the proposed retention standard if greater) evenly distributed in the buffer 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.

SHALSTAB modeling (Figure 2) highlights three Value 1 areas within the operational portions of the plan. A fourth Value 1 area is modeled within the harvest exclusion for a Class II RMZ within Unit 1. Two of the three Value 1 areas are located within and adjacent the upslope extents of Class III watercourses. The Value 1 areas are identified by two pixels suggesting regionally limited extent of steeply convergent slopes. Two Value 1 areas are located in Unit 4. One modeled near the upslope extent of a Class III watercourse correlates

A) General Observations

with debris slide amphitheatre slopes mapped on Figure 3 and is shown to have a moderate Mass Wasting Potential on Figure 4. The other Value 1 area in Unit 4 is on slopes that do not lead to a watercourse and are also modeled as moderate Mass Wasting Potential on Figure 4. The Value 1 area modeled in Unit 3 is located within and adjacent a Class III watercourse. Debris slide amphitheatre slopes mapped on Figure 3 correlate with the Value 1 area and Mass Wasting Potential is modeled as high on Figure 4. This area is near the Tier I/Tier II divide. During our field review of the Value 1 areas we did not observe potentially unstable slopes. No Value 1 pixels are modeled within the operational portions of Units 1, 2, and 5.

SHALSTAB modeling of Value 2 pixels is more prevalent within the plan area and is modeled in all units, primarily on slopes leading towards watercourses. We observed strong correlation between SHALSTAB 2 pixels and debris slide amphitheatre slopes mapped on Figure 3. These areas also correlate well with moderate Mass Wasting Potential modeled on Figure 4. It is apparent the Value 2 pixels, debris slide amphitheatre slopes, and moderate MWP all correlate with watercourses. Field review of these areas did not indicate landslides or potentially unstable slopes associated with SHALSTAB modeled Value 2 areas.

Figure 4 shows Mass Wasting Potential (MWP) modeling within the units varies from low to high. Low MWP is modeled in the majority of the areas proposed for harvest. Moderate MWP is much less prevalent and typically correlates with watercourses. One area of high MWP is modeled in the southern portion of Unit 3. The high MWP roughly correlates with the upslope extent of a previously mapped dormant old landslide and debris slide amphitheatre slopes mapped on Figures 6 and 3 respectively. Previous mapping for the Half Rack THP (01-453) locates a dormant old landslide in this vicinity on Figure 1. The THP mapping does not correlate other landslide mapping or the high MWP modeling.

No potentially unstable areas were identified in the operational portions of the units by the Forester based on CLFA (1999) guidlines. Geologic review of the plan indicates the Foresters findings to be accurate. Landslides that are dormant young or older have not historically reactivated following highly impactive harvest management and are not anticipated to do so following this harvest.

B) Harvest Related Impacts and Hillslope Sensitivity

These slopes performed well following the initial clear cut harvest when slope stability was not a criterion for land management and timber harvesting was unregulated. This harvest plan has been review and approved by various state agencies. The current planned cable yarding of the more steeply inclined slopes will result in less surface disturbance and significantly reduce the potential for mass wasting.

B) Harvest Related Impacts and Hillslope Sensitivity
Coupled with a partial harvest, the mass wasting potential is reduced even more. Surface disturbance has occurred within the unit in response to past logging activities. The disturbance is the culmination of road construction and yarding of old growth timber. Following that impact, the area appears to have adjusted through minor slumping and settling and has reforested. The extensive RMZs were designed to provide sediment filtration bands adjacent the watercourses should extensive sediment be generated from the clearcut harvesting. The current level of harvest will retain both canopy closure and slash from the harvested trees potentially increasing the effectiveness of the sediment filtration band to the whole unit. Overall hillslope sensitivity with respect to the proposed selection harvest appears minimal with respect to mass wasting. Please see Section V of the THP for a more comprehensive assessment of the slope stability and geologic conditions of the plan area.

C) Forestry / Silviculture Plan
We have not changed the silviculture in response to this evaluation.

D) Operational Design Plan
THP approved yarding method is cable where slopes are moderate to steeply inclined and ground based yarding on gently inclined slopes. As delineated, the proposed yarding methods appear appropriate.

References:

CGS, 2005, Geologic and Geomorphic Features Related to Landsliding, Elk River Watershed, Humboldt County, California. Department of Conservation, now California Geological Survey (CGS) 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

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,

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, 2004, Elk River / Salmon Creek Watershed Analysis, Scotia, California, prepared for Pacific Lumber Company (PALCO) dated 2004?, 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, 1999, The Pacific Lumber Company's Habitat Conservation Plan, Vol. 2 Part D, Landscape Assessment of Geomorphic Sensitivity, Public Review Draft.

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 models 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.

Professional Certification of Design

I, Tagg Nordstrom, P.G. 7950, 2/15/11,
Name license # Date

PROFESSIONAL GEOLOGIST
TAGG S. NORDSTROM
No. 7950
STATE OF CALIFORNIA

Place licensed seal here

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. 1-08-041 HUM (Whiskey) Units: 1 through 5

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.

Table 1 Proposed 2011 Harvest in Freshwater Creek

THP Name	THP Number	Unit Number	Silviculture CC	ROW	shr	SEL	CC Equivalent	Hazard Low	High*
Whiskey	08-041	1				20 9	10 5	20 6	1.2
Whiskey	08-041	2.1				13.6	6 8	13 4	0 8
Whiskey	08-041	3.1				23.9	12 0	23 9	0.0
Whiskey	08-041	4				32	16.0	32	0.0
Whiskey	08-041	5				11 3	5 7	9.5	6.9
Becks Tier 1	10-12	tier 1				100.3	50 15	98 9	5 40
Becks Tier 2	10-12	tier 2		6 3		380 1	194 775	338 4	184 3
							0		
Whiskey	08-041	3.2				11 5	5 8	5.7	22 4
Whiskey	08-041	2 2				9.9	4 95	9 8	0 4
							0		
							0		
							0		
							0		
							306 5		

*The acres represented here have been converted to High Hazard Acres by multiplying by 3 8404.

TBD - Planning is either in the approval or preperation stage Acreages are not finalized yet They will be finalized prior to enrollment

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 enforcable Zero Discharge Monitoring Plan (Tier II)

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

THP Name	THP Number	Unit Number	Yarding System Ground Based	Yarder	Helicopter	Site Preparation Mechanical	Broadcast
Whiskey	08-041	1	20 9	0		0	0
Whiskey	08-041	2	1 8	11.8			
Whiskey	08-041	3	9 3	14 6			
Whiskey	08-041	4	19	13			
Whiskey	08-041	5	0	11.3			
Becks Tier 1	10-12	tier 1	90 9	0			
Becks Tier2	10-12	tier 2	193 2	193.2			
Another Whiskey							
Whiskey	08-041	3 2	0	11.5			
Whiskey	08-041	2 2	9 9				

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March 10th, 2011

Catherine Kuhlman
North Coast Regional Water Quality Control Board
5550 Skylane Blvd suite A
Santa Rosa, CA. 95403

Re: ECP update for 1-08-041

Dear Ms. Kuhlman

No additional sediment sites have been found.

Sincerely,

Jon Woessner
North Area Manager
Humboldt Redwood Co., LLC
RPF# 2571

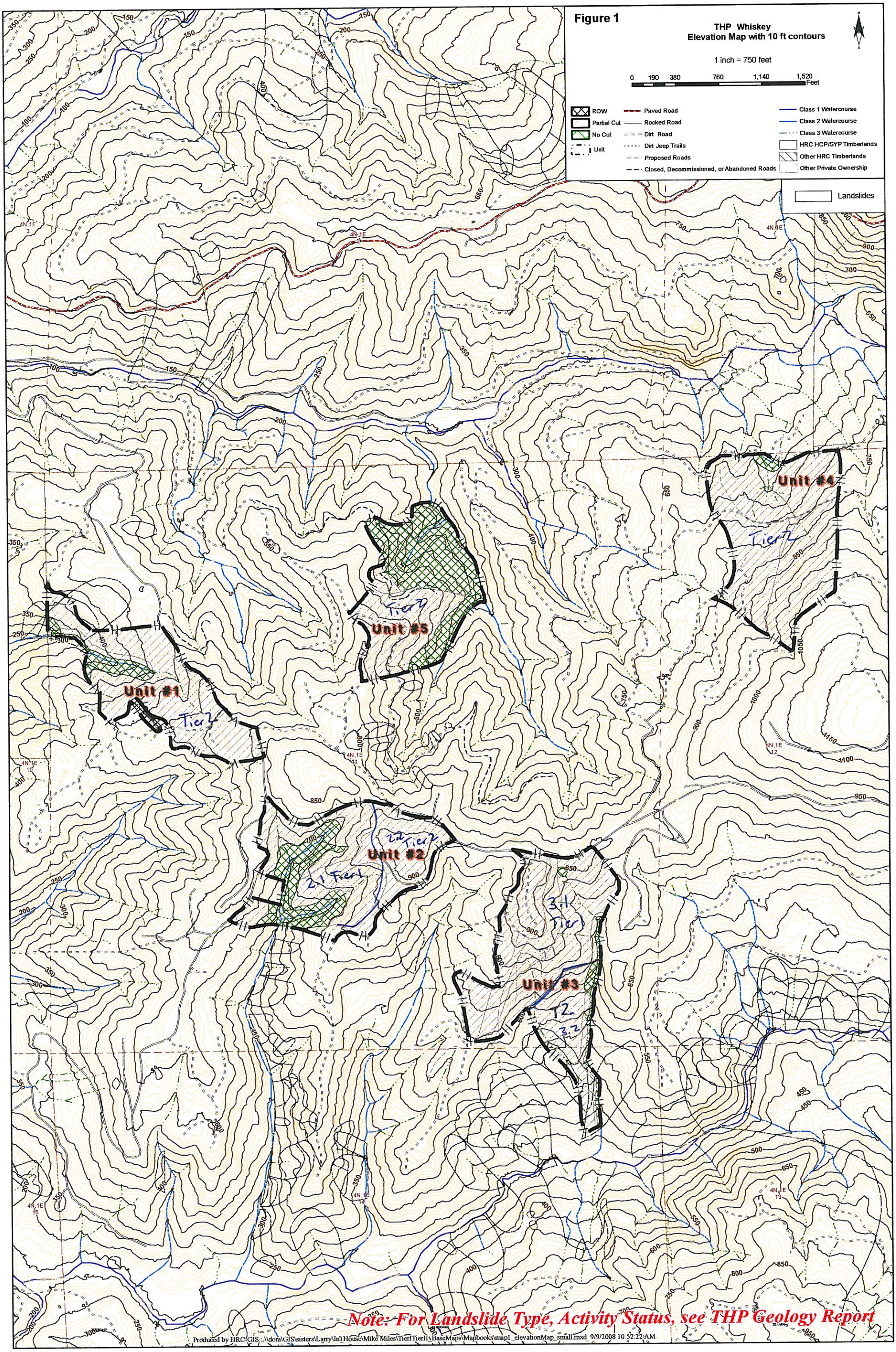
Figure 1
THP Whiskey
Elevation Map with 10 ft contours
1 inch = 750 feet
0 190 380 760 1,140 1,520 Feet
ROW
Partial Cut
No Cut
Unit
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
Landslides
Unit #1
Unit #2
Unit #3
Unit #4
Unit #5
Tier 2
2.1 Tier 1
3.1 Tier 1
T2
3.2
4N,1E
Note: For Landslide Type, Activity Status, see THP Geology Report
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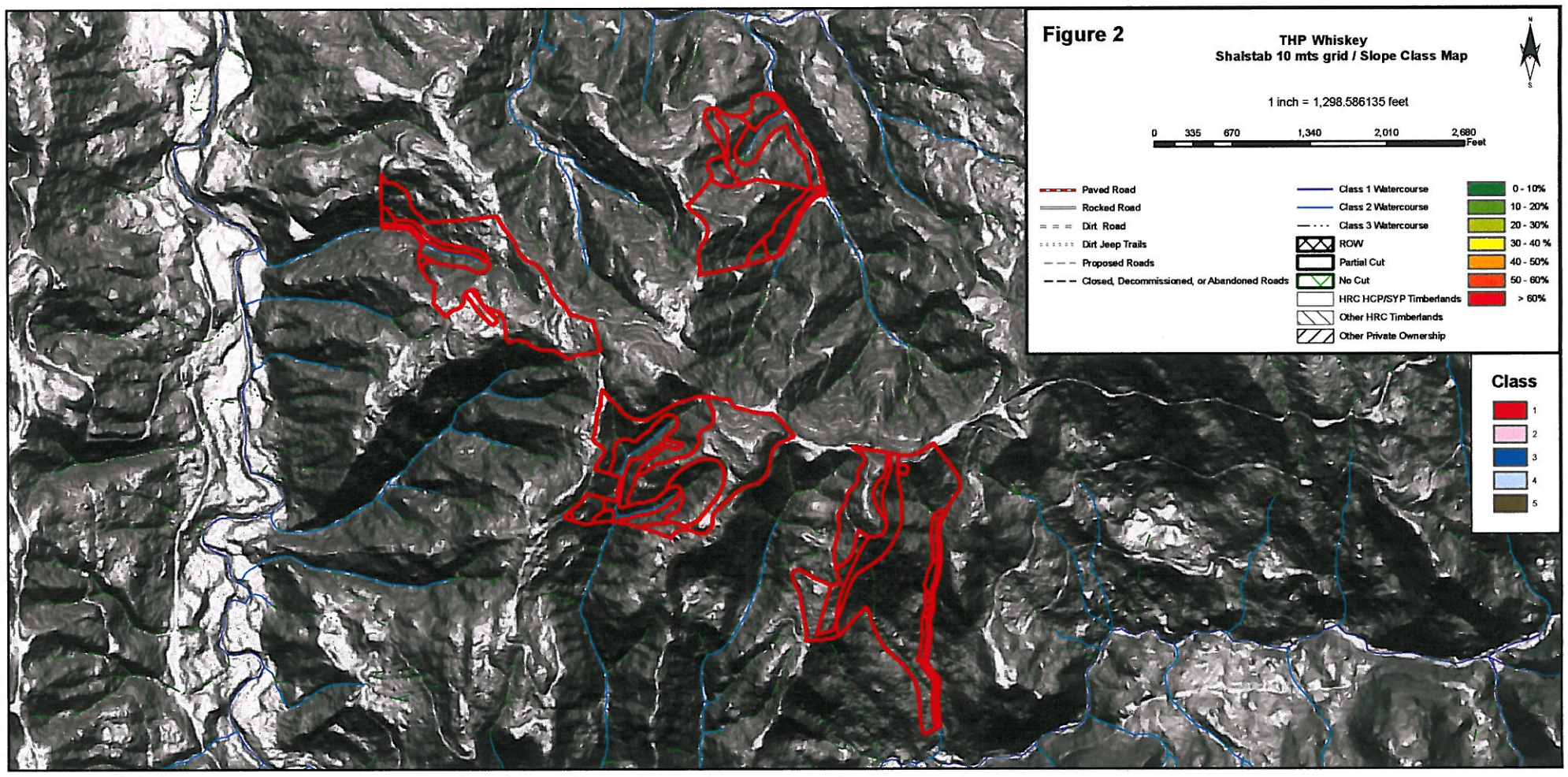
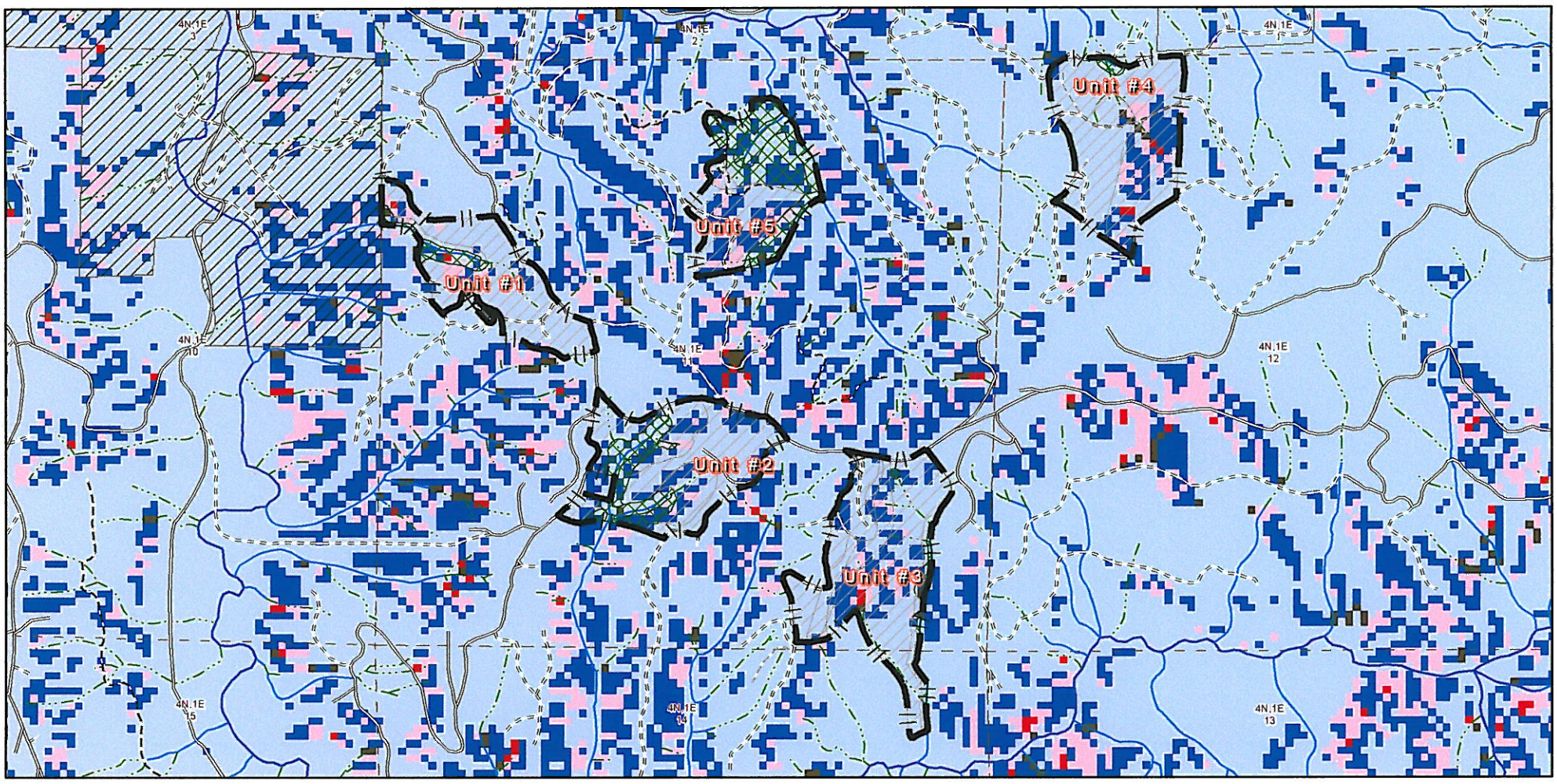
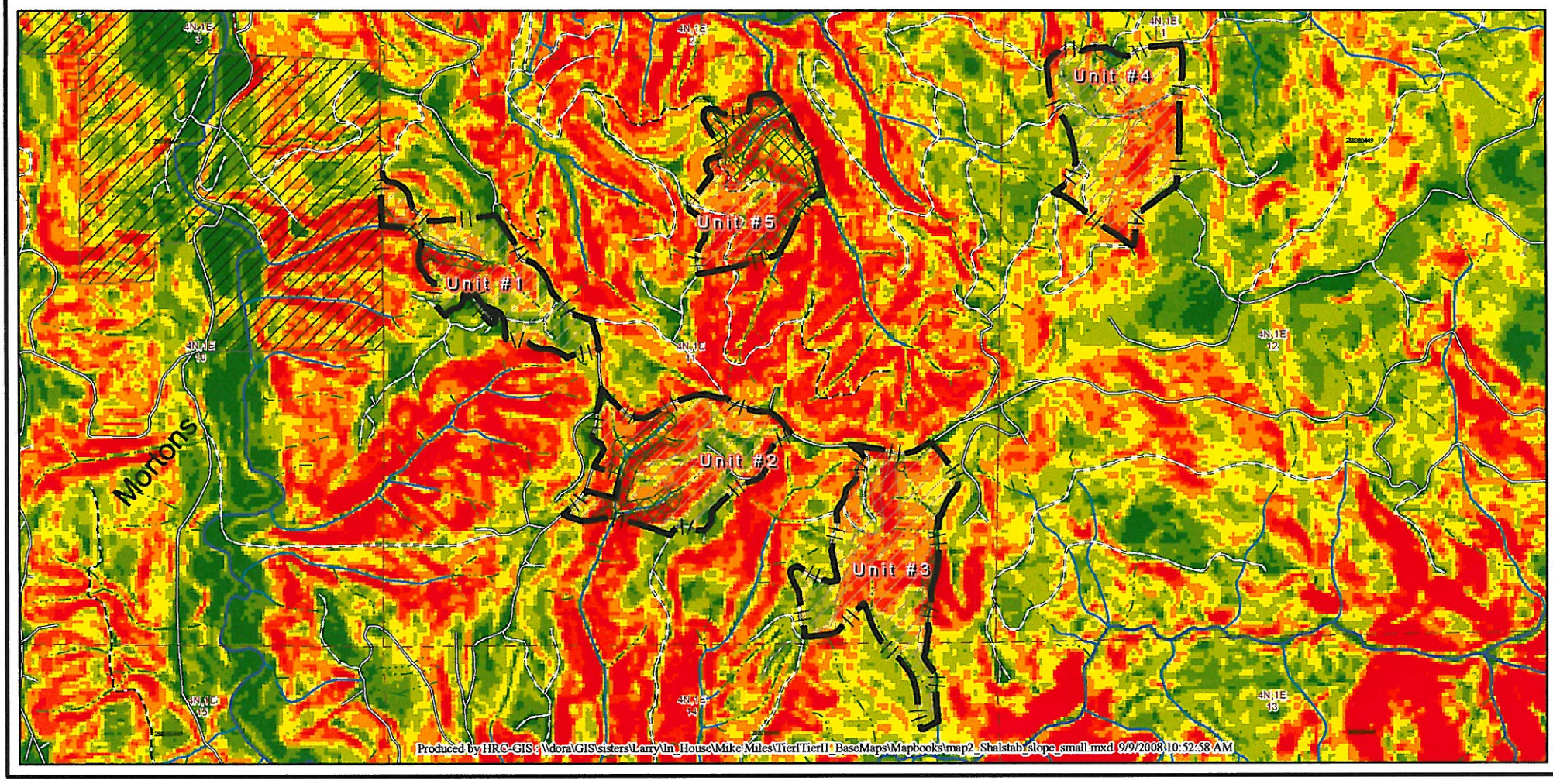


Figure 2
THP Whiskey
Shalstab 10 mts grid / Slope Class Map
1 inch = 1,298.586135 feet
0 335 670 1,340 2,010 2,680 Feet
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
ROW
Partial Cut
No Cut
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
0 - 10%
10 - 20%
20 - 30%
30 - 40 %
40 - 50%
50 - 60%
> 60%
Class
1
2
3
4
5


Unit #1
Unit #2
Unit #3
Unit #4
Unit #5
Unit #6
4N,1E 3
4N,1E 2
4N,1E 1
4N,1E 10
4N,1E 11
4N,1E 12
4N,1E 15
4N,1E 14
4N,1E 13


Unit #1
Unit #2
Unit #3
Unit #4
Unit #5
Mormons
4N,1E 3
4N,1E 2
4N,1E 1
4N,1E 10
4N,1E 11
4N,1E 12
4N,1E 15
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4N,1E 13
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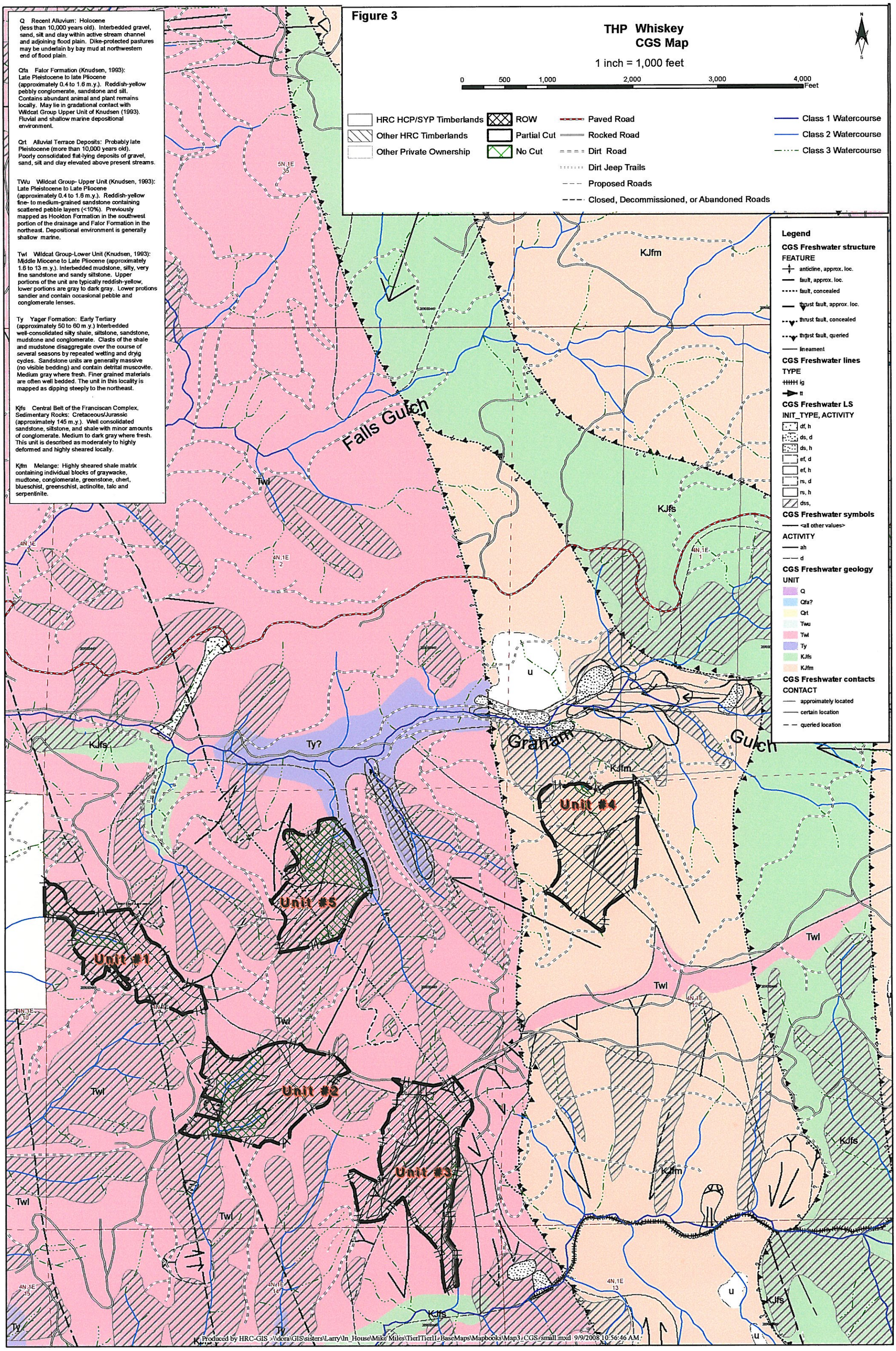
Figure 3
THP Whiskey
CGS Map
1 inch = 1,000 feet
0 500 1,000 2,000 3,000 4,000 Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
Q Recent Alluvium: Holocene (less than 10,000 years old). Interbedded gravel, sand, silt and clay within active stream channel and adjoining flood plain. Dike-protected pastures may be underlain by bay mud at northwestern end of flood plain.
Qfa Falor Formation (Knudsen, 1993): Late Pleistocene to late Pliocene (approximately 0.4 to 1.6 m.y.). Reddish-yellow pebbly conglomerate, sandstone and silt. Contains abundant animal and plant remains locally. May lie in gradational contact with Wildcat Group Upper Unit of Knudsen (1993). Fluvial and shallow marine depositional environment.
Qrt Alluvial Terrace Deposits: Probably late Pleistocene (more than 10,000 years old). Poorly consolidated flat-lying deposits of gravel, sand, silt and clay elevated above present streams.
TWu Wildcat Group- Upper Unit (Knudsen, 1993): Late Pleistocene to Late Pliocene (approximately 0.4 to 1.6 m.y.). Reddish-yellow fine- to medium-grained sandstone containing scattered pebble layers (<10%). Previously mapped as Hookton Formation in the southwest portion of the drainage and Falor Formation in the northeast. Depositional environment is generally shallow marine.
Twl Wildcat Group-Lower Unit (Knudsen, 1993): Middle Miocene to Late Pliocene (approximately 1.6 to 13 m.y.). Interbedded mudstone, silty, very fine sandstone and sandy siltstone. Upper portions of the unit are typically reddish-yellow, lower portions are gray to dark gray. Lower protions sandier and contain occasional pebble and conglomerate lenses.
Ty Yager Formation: Early Tertiary (approximately 50 to 60 m.y.) Interbedded well-consolidated silty shale, siltstone, sandstone, mudstone and conglomerate. Clasts of the shale and mudstone disaggregate over the course of several seasons by repeated wetting and dryig cycles. Sandstone units are generally massive (no visible bedding) and contain detrital muscovite. Medium gray where fresh. Finer grained materials are often well bedded. The unit in this locality is mapped as dipping steeply to the northeast.
Kjfs Central Belt of the Franciscan Complex, Sedimentary Rocks: Cretaceous/Jurassic (approximately 145 m.y.). Well consolidated sandstone, siltstone, and shale with minor amounts of conglomerate. Medium to dark gray where fresh. This unit is described as moderately to highly deformed and highly sheared locally.
Kjfm Melange: Highly sheared shale matrix containing individual blocks of graywacke, mudtone, conglomerate, greenstone, chert, blueschist, greenschist, actinolite, talc and serpentinite.
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
Q
Qfa?
Qrt
Twu
Twl
Ty
KJfs
KJfm
CGS Freshwater contacts
CONTACT
approimately located
certain location
queried location
Falls Gulch
Graham
Gulch
KJfm
KJfs
Twl
Ty?
u
Unit #1
Unit #2
Unit #3
Unit #4
Unit #5
5N,1E 35
4N,1E 3
4N,1E 2
4N,1E 1
4N,1E 10
4N,1E 15
4N,1E 14
4N,1E 13
4N,1E 12
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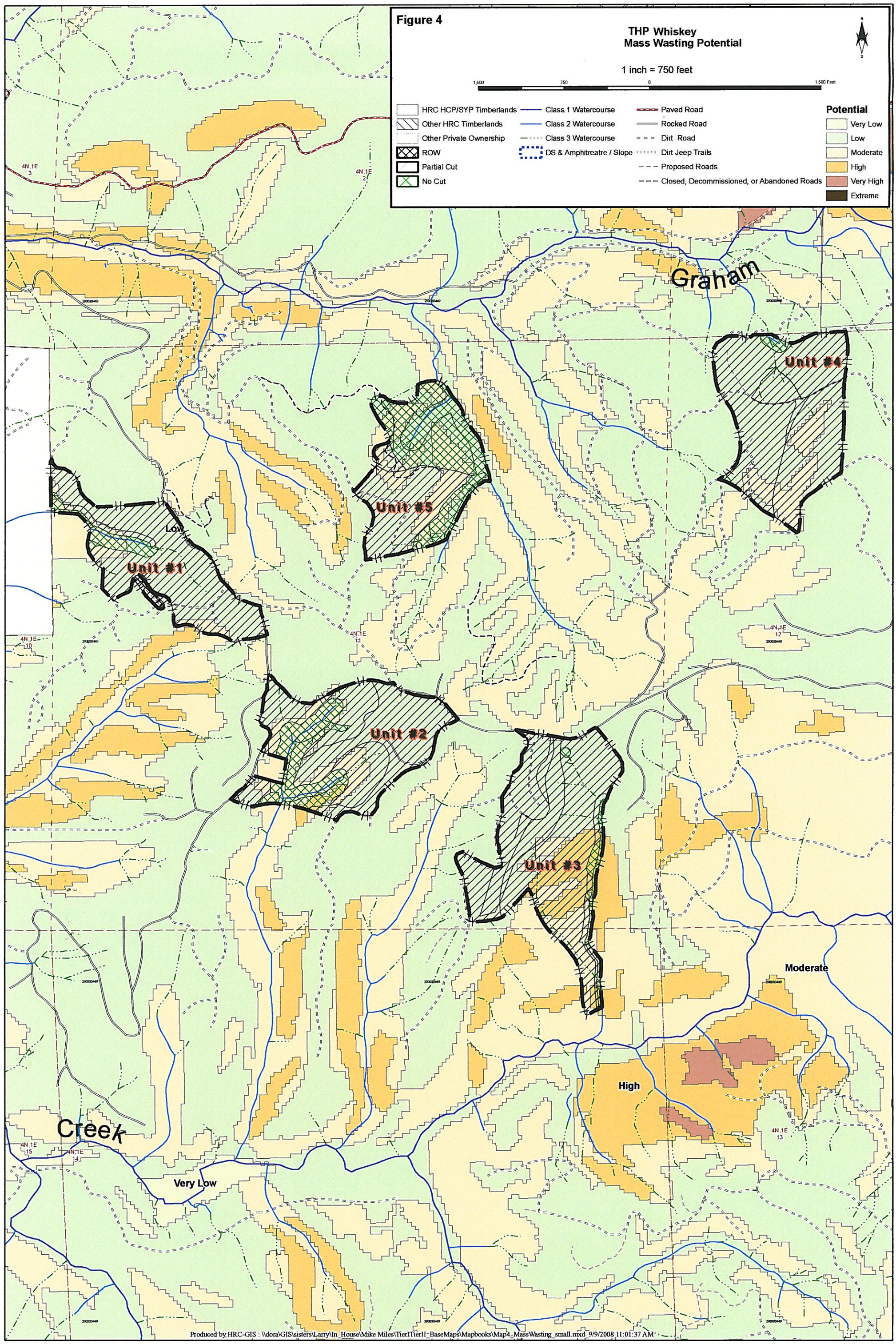
Figure 4
THP Whiskey
Mass Wasting Potential
1 inch = 750 feet
1,500
750
0
1,500 Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
DS & Amphitreatre / Slope
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Potential
Very Low
Low
Moderate
High
Very High
Extreme
Graham
Creek
Unit #1
Unit #2
Unit #3
Unit #4
Unit #5
Low
Moderate
High
Very Low
4N,1E
3
4N,1E
2
4N,1E
10
4N,1E
11
4N,1E
12
4N,1E
13
4N,1E
15
4N,1E
14
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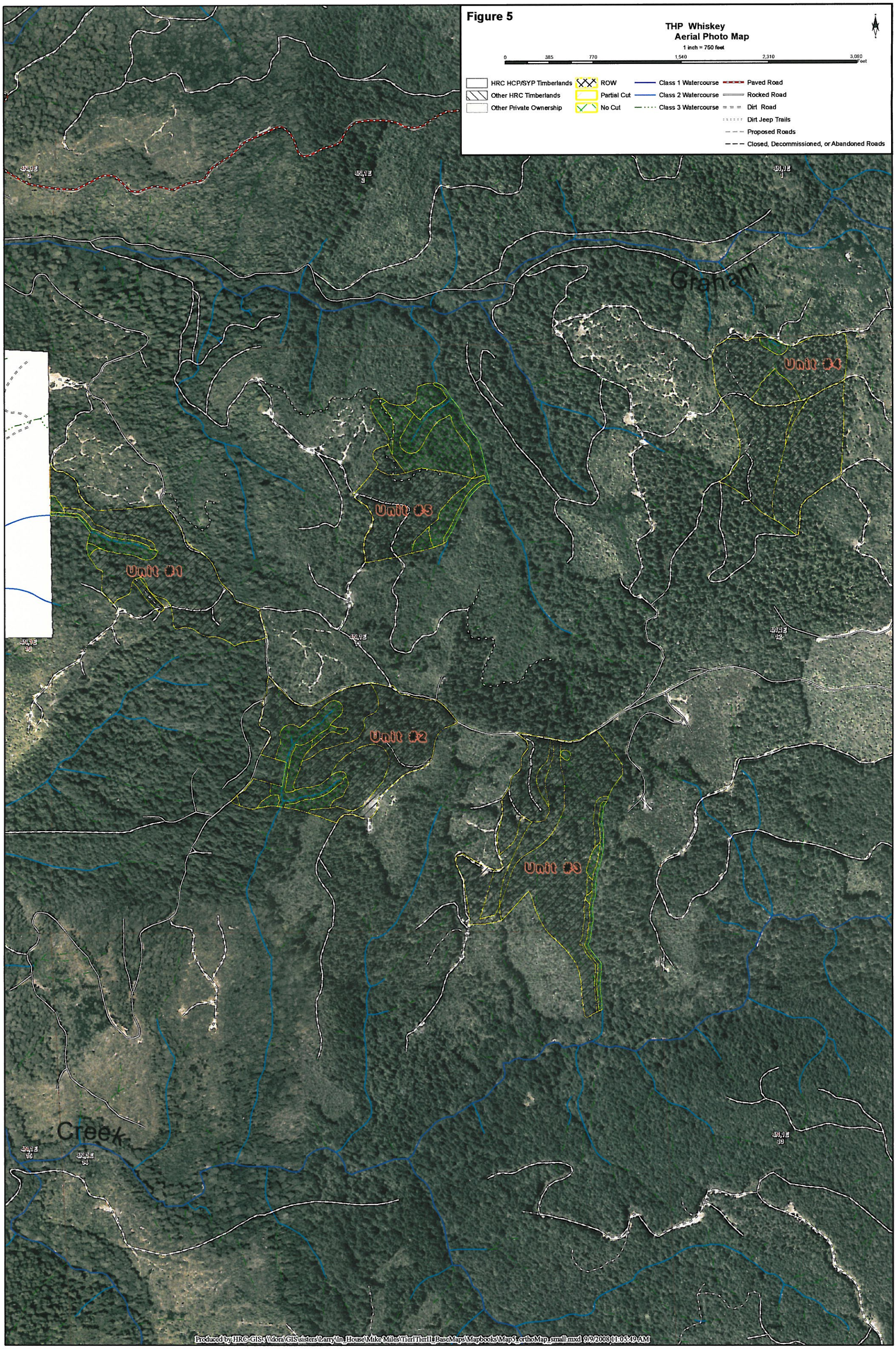
Figure 5
THP Whiskey
Aerial Photo Map
1 inch = 750 feet
0
385
770
1,540
2,310
3,080
Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Graham
Creek
Unit #1
Unit #2
Unit #3
Unit #4
Unit #5
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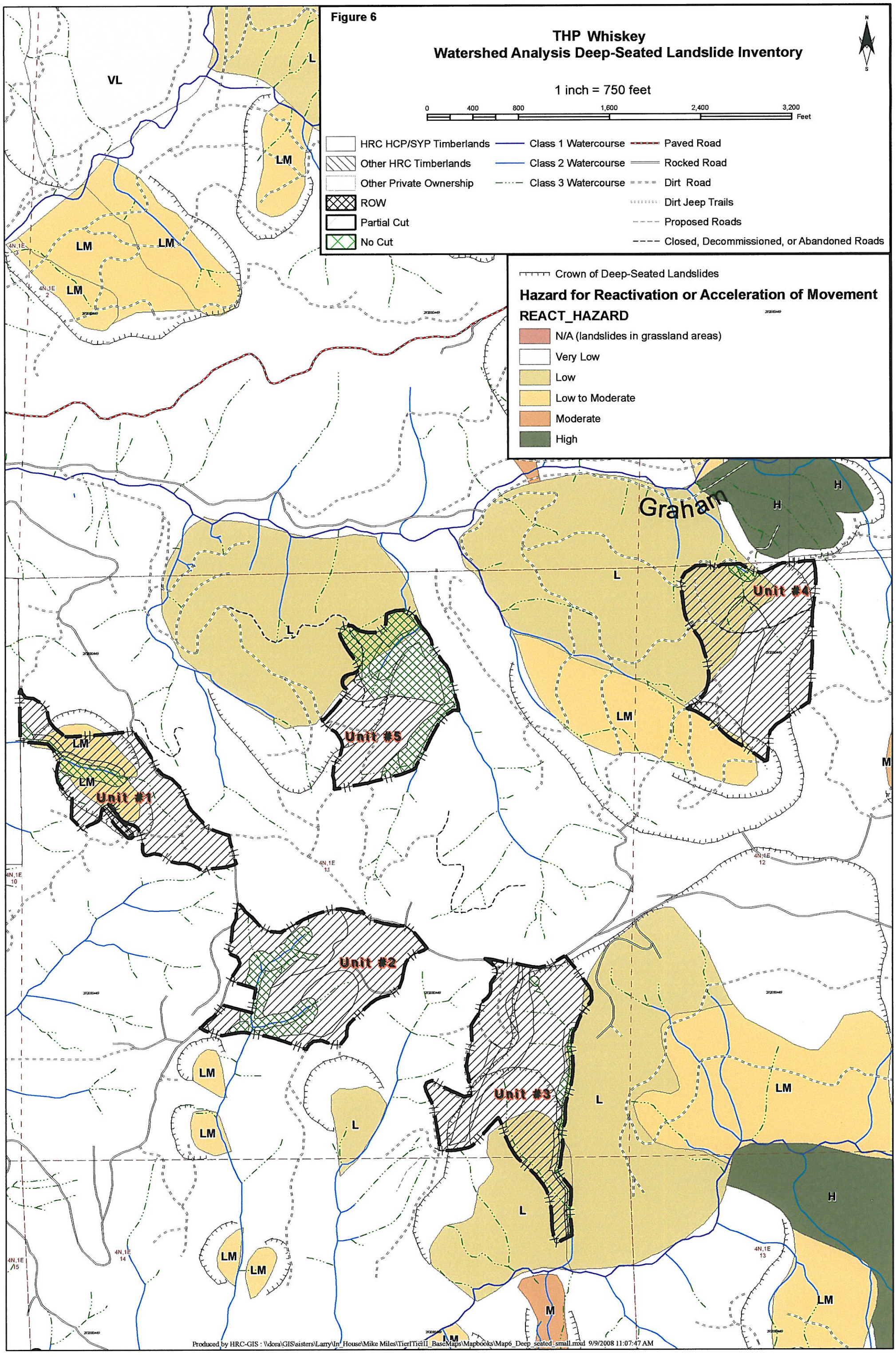
Figure 6
THP Whiskey
Watershed Analysis Deep-Seated Landslide Inventory
1 inch = 750 feet
0
400
800
1,600
2,400
3,200
Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
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
Graham
Unit #1
Unit #2
Unit #3
Unit #4
Unit #5
VL
L
LM
M
H
4N,1E
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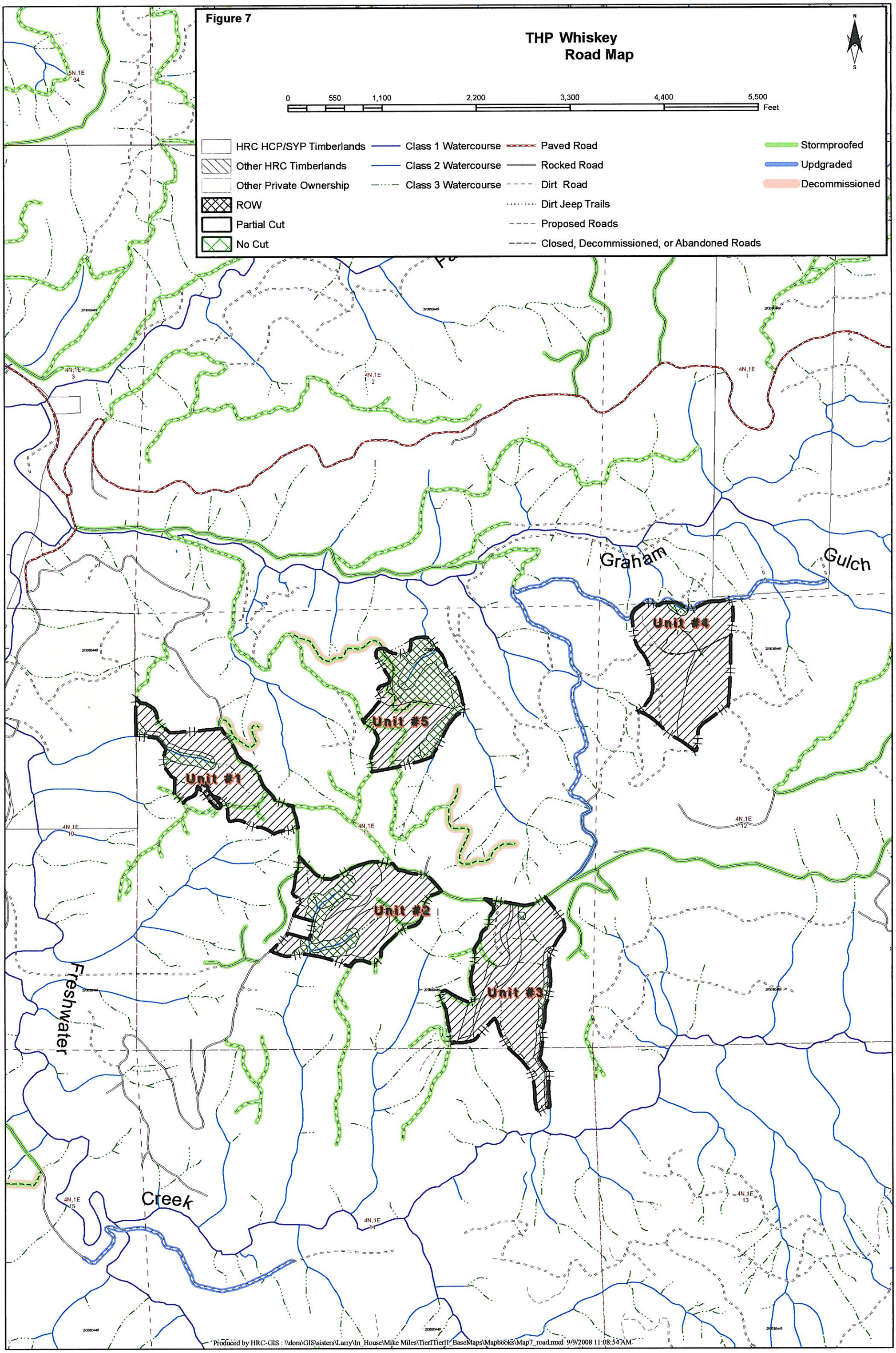
Figure 7
THP Whiskey
Road Map
N
S
0
550
1,100
2,200
3,300
4,400
5,500
Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Stormproofed
Updgraded
Decommissioned
Graham
Gulch
Freshwater
Creek
Unit #1
Unit #2
Unit #3
Unit #4
Unit #5
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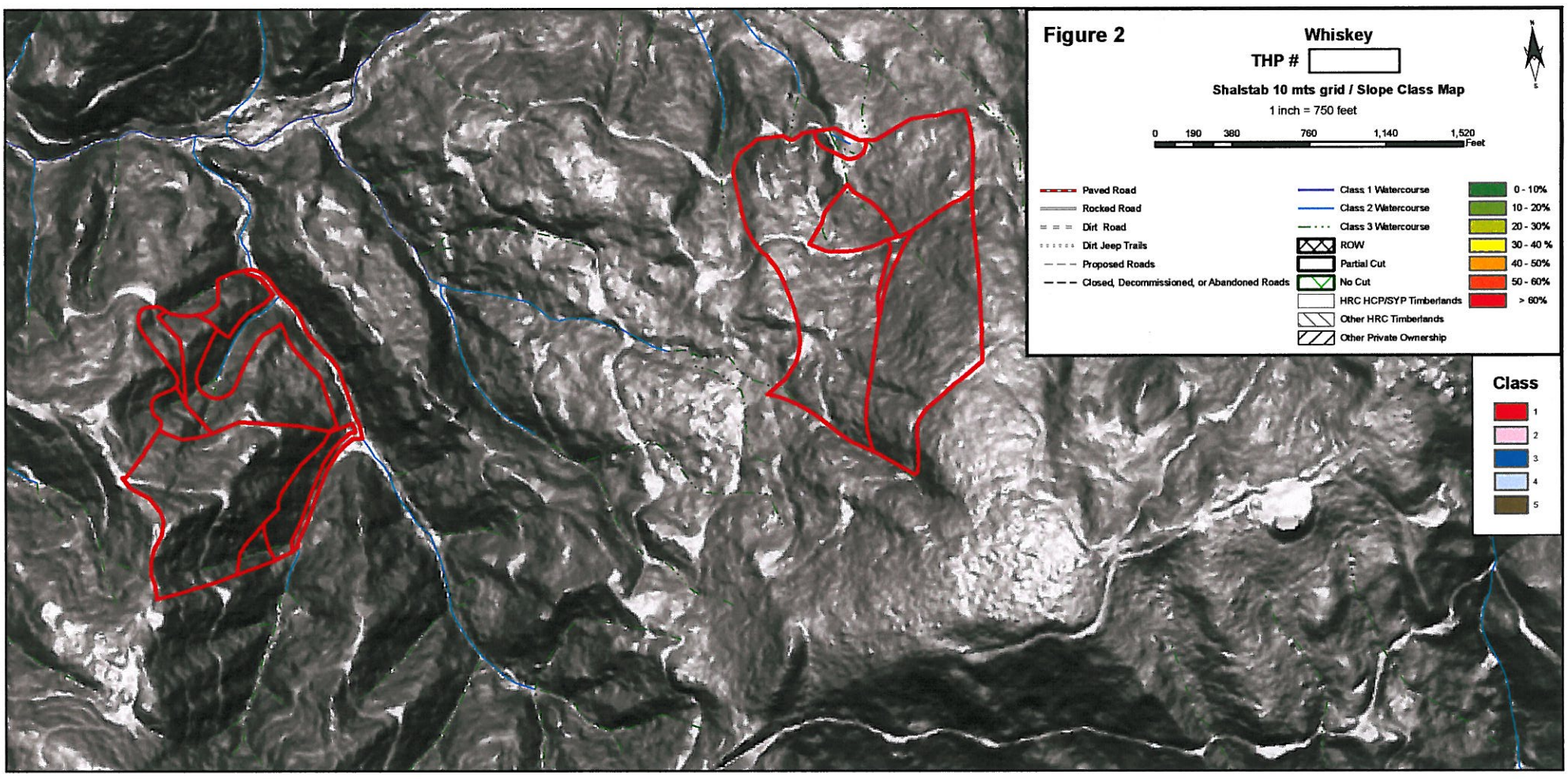
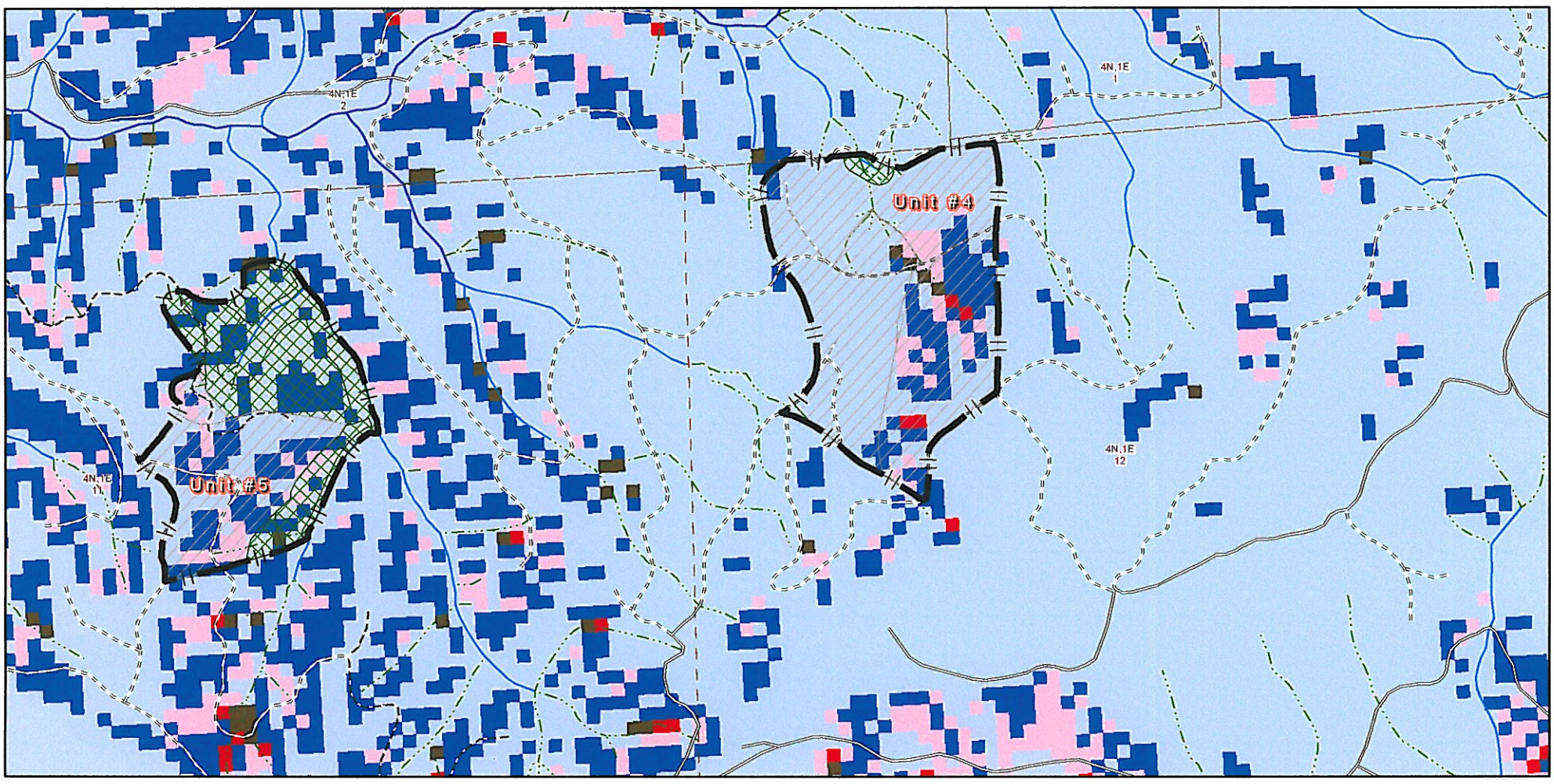
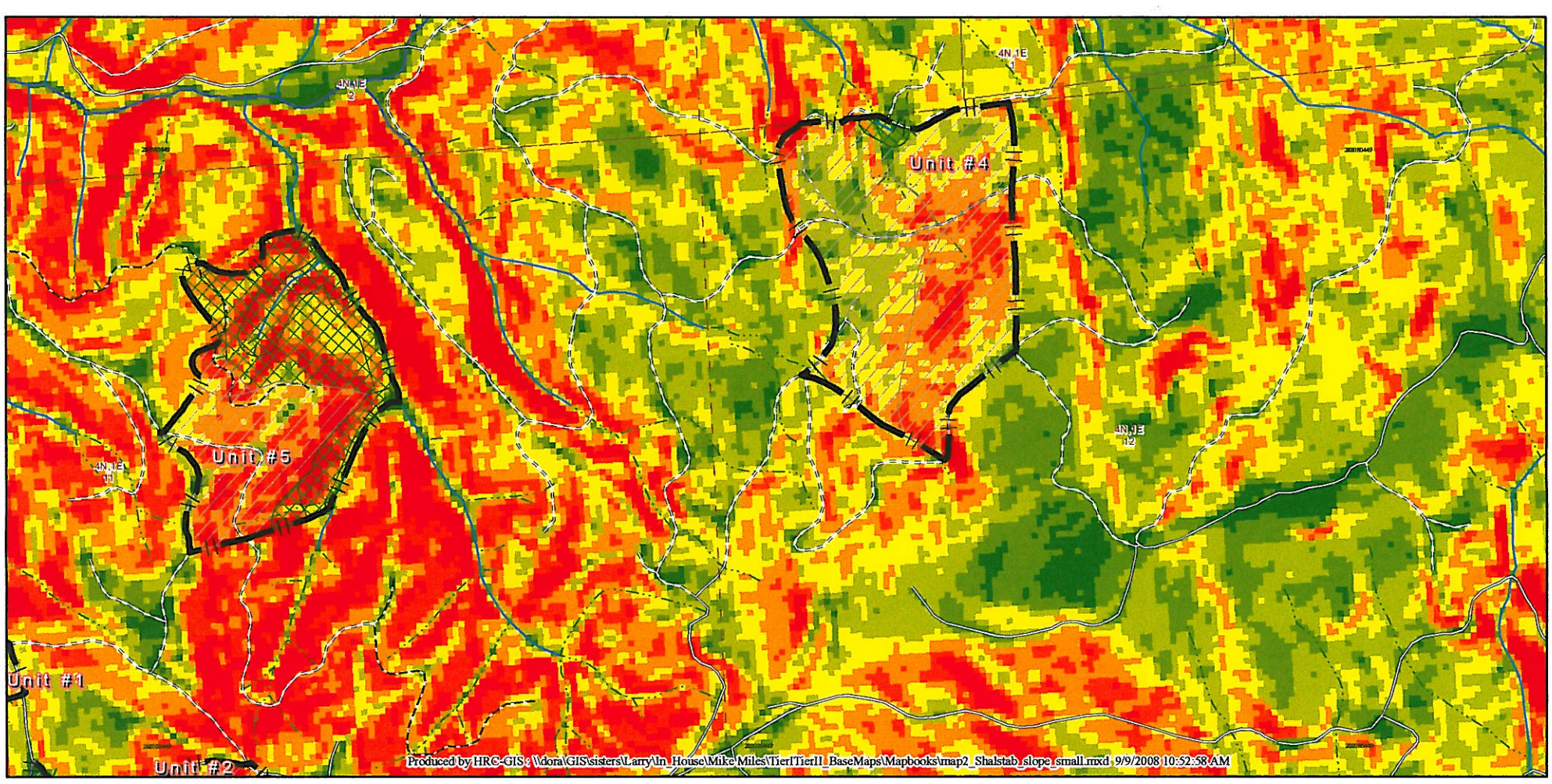


Figure 2
Whiskey
THP #
Shalstab 10 mts grid / Slope Class Map
1 inch = 750 feet
0 190 380 760 1,140 1,520 Feet
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
ROW
Partial Cut
No Cut
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
0 - 10%
10 - 20%
20 - 30%
30 - 40 %
40 - 50%
50 - 60%
> 60%
Class
1
2
3
4
5


4N,1E
2
4N,1E
1
Unit #4
Unit #5
4N,1E
11
4N,1E
12


4N,1E
2
4N,1E
1
Unit #4
Unit #5
4N,1E
11
4N,1E
12
Unit #1
Unit #2
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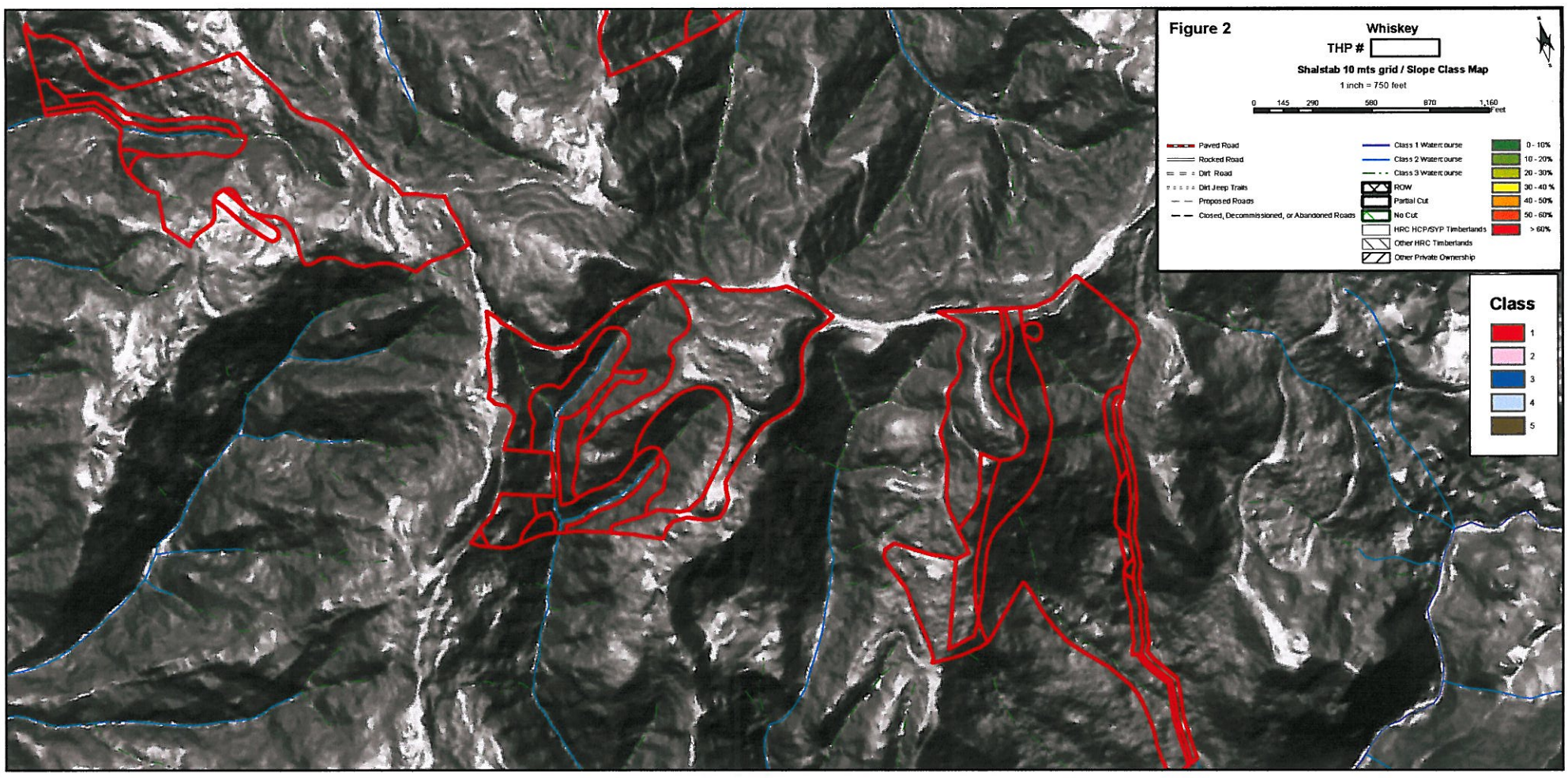
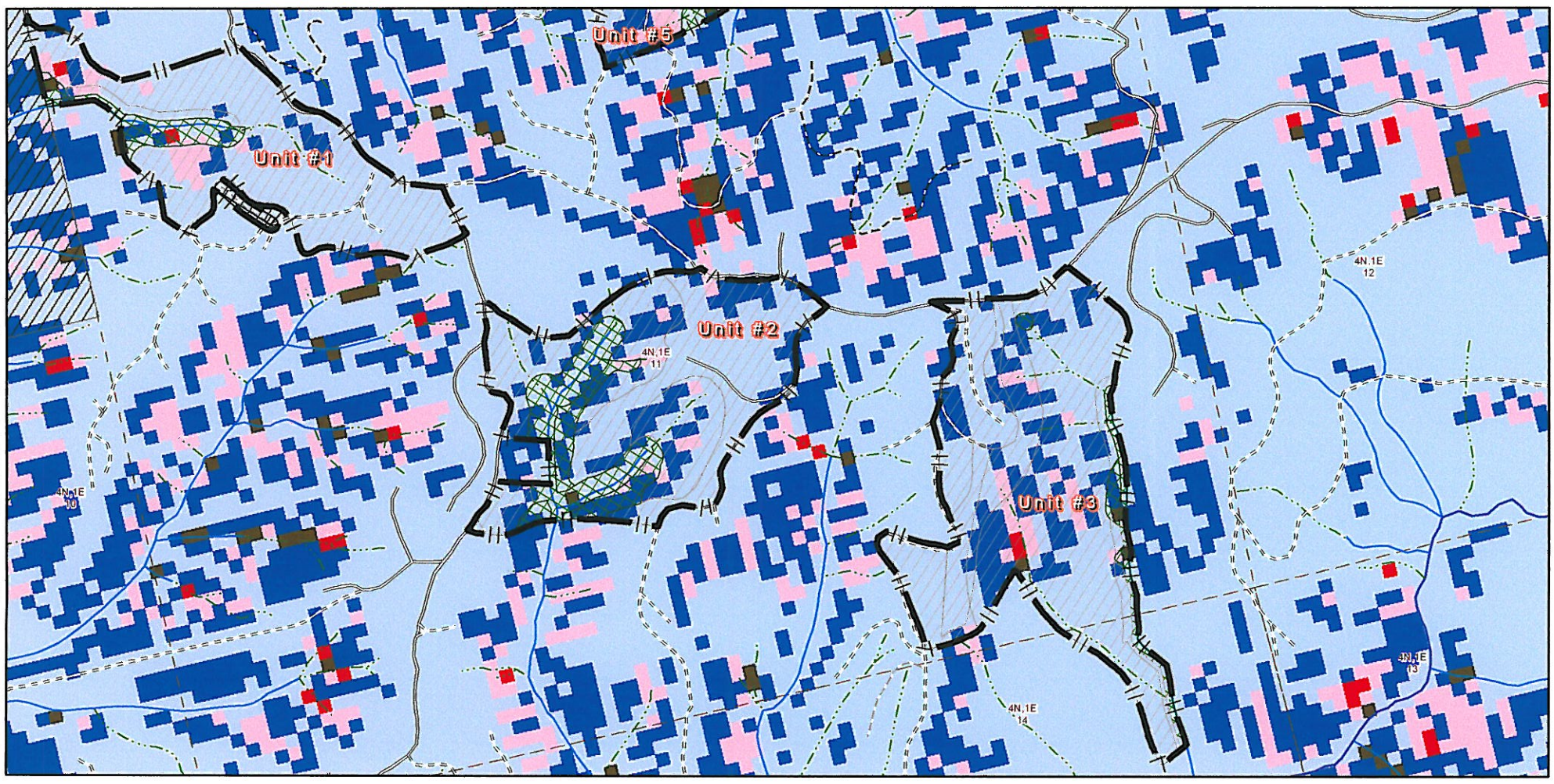
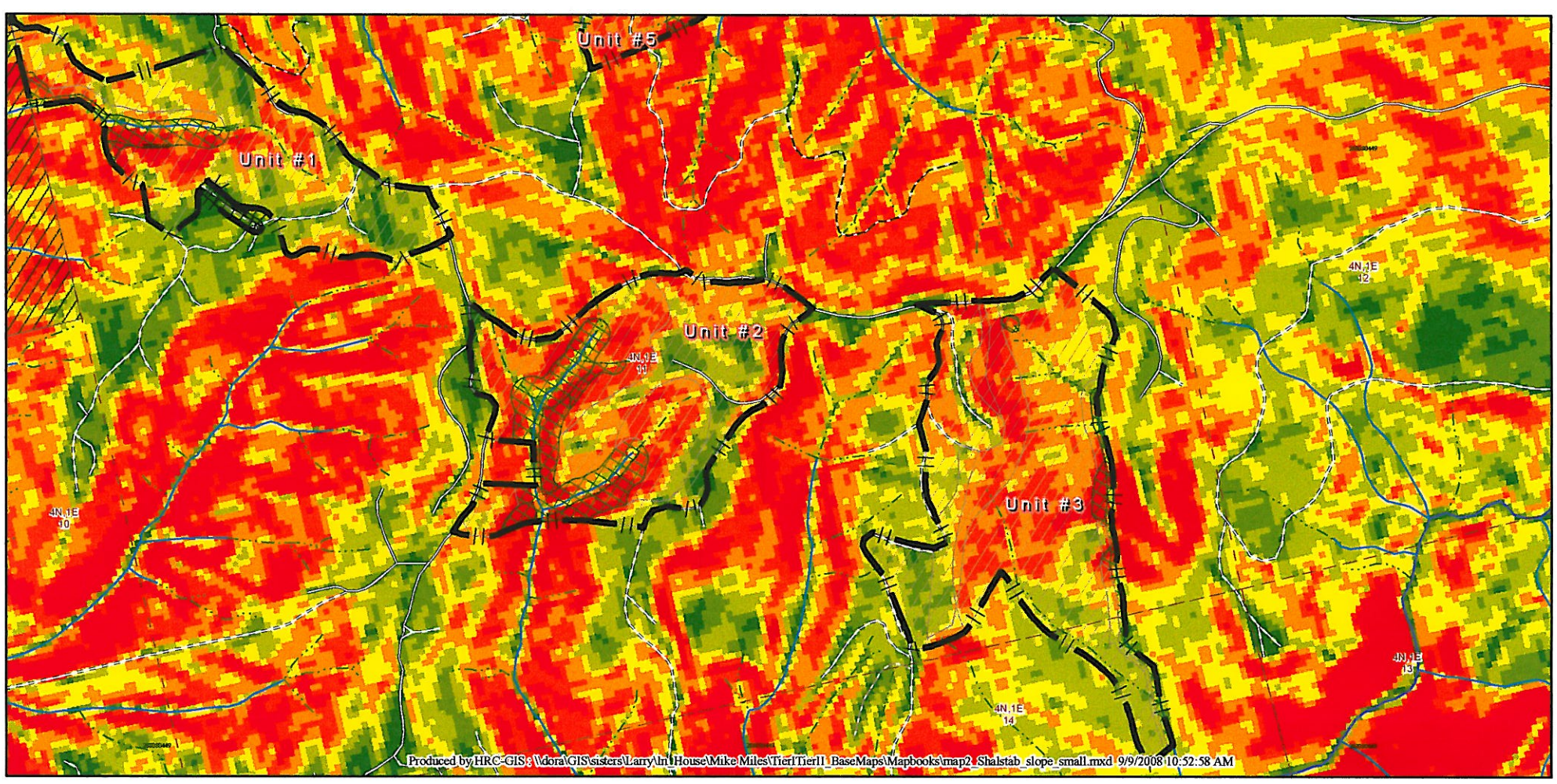


Figure 2
Whiskey
THP #
Shalstab 10 mts grid / Slope Class Map
1 inch = 750 feet
0 145 290 580 870 1,160 Feet
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
ROW
Partial Cut
No Cut
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
0 - 10%
10 - 20%
20 - 30%
30 - 40 %
40 - 50%
50 - 60%
> 60%
Class
1
2
3
4
5


Unit #5
Unit #1
Unit #2
Unit #3
4N,1E 11
4N,1E 12
4N,1E 10
4N,1E 13
4N,1E 14


Unit #5
Unit #1
Unit #2
Unit #3
4N,1E 11
4N,1E 12
4N,1E 10
4N,1E 13
4N,1E 14
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