Humboldt Redwood
COMPANY, LLC

Main Office
P.O. Box 37
Scotia, CA 95565
(707) 764-4472

Timber Operations
P.O. Box 712
Scotia, CA 95565
(707) 764-4472

March 3, 2010

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 1-09-018 HUM (Unit 1) in the Elk River WWDR, "Tier II"

Dear: Ms. Kuhlman

HRC is requesting Tier II enrollment under Watershed-Wide Waste Discharge Requirement (WWDR) Order No. R1-2006-0039 for unit 1 of THP 1-09-018 HUM. This Tier II portion of the unit proposed for enrollment is comprised of 36.5 acres of group selection (18.25 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), 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 Tier 2 acres proposed for enrollment in Unit 1 include moderate to steeply inclined slopes underlain by undifferentiated Wildcat Group sediments. No operational changes were made to the approved THP as a result of this review. The proposed acres include both Group and Single Tree selection silviculture that will be cable yarded. The watercourses and unstable areas are included within buffers that prohibit the placement of groups within the more sensitive areas. Following CLG review during THP development and CLG review for this enrollment, we consider the proposed silviculture and yarding methods to be compatible with the existing geologic conditions at the level necessary for Tier 2 enrollment.

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The THP proposes an uneven-age silviculture retaining 75 sq.ft. 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 tractor yarding are 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 R1-2006-0039 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. R1-2006-0039).

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

THP: North Ridge THP 09-018 Unit # 1 March 15, 2010

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
1-1, 1-2 and 1-3	THP approved silviculture is group selection with single tree selection within identified unstable areas and watercourse protection zones. No site preparation will occur due to partial harvesting.	The approved THP contains both ground based yarding atop the ridges and cable yarding of the more steeply inclined slopes. No change to approved yarding methods.

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

Unit 1 includes three typically triangular shaped units within the basin of small Class II tributary to North Fork Elk River. Portions of this harvest unit have been enrolled as Tier 1 acres. The remaining areas are proposed for Tier 2 acres.

Figure 3 shows the unit to be underlain by undifferentiated Wildcat Group sediments. These sediments are composed of silts, sands, clays, and infrequent gravels that are moderately to well consolidated. The slopes are moderate to steeply inclined, include moderately well defined watercourse channels. Figure 3 maps debris slide / source areas atop the moderate to steeply inclined slopes within the western most triangle.

Figure 6 shows dormant deep seated translational / rotational landslide encroaching within the southwester triangle of the unit. It appears that the most prominent component of the failures within the unit are the scarps. An additional segment of dormant deep seated scarp is located within the northernmost component of the unit.

Figure 2 review (Hillslope shade) shows regionally irregular slopes throughout the unit. The surface texture of the unit resembles weathering consistent with soft, moderately consolidated sediments. The prominent watercourse channels are visible and extend to the ridgetop. There is poor correlation between the Figure 6 deep seated landsliding and Hillslope shade coverage. Where the landslides are mapped, the topography is subtly scalloped but weathered consistent with adjacent unscalloped slopes.

The THP included a Note 45 Geology report to address several unstable areas. For a more comprehensive review of the geology associated with this harvest unit, please see the report in Section 5 of the THP. The approved silviculture is group selection with single tree selection within unstable areas and watercourse protection zones. The yarding methods include ground based where atop the gently inclined ridge tops and cable yarding where slopes are more steeply inclined. A few short road spurs are approved to be constructed to gain appropriate cable yarding access.

The area has been previously clearcut and ground-based logged with bulldozers. Significant ground disturbance is observable throughout the unit in response to past harvest practices.

The unit has been addressed as three polygons. Polygon 3 includes a level one owl. Although reviewed for enrollment in this document, actual enrollment will occur later in the future.

THP Unit: # 1
Polygon: 1-1

A) General Observations

The Tier acres are limited to the cable yarded ground within this polygon.

The polygon is essentially north facing and occupies ridgtetop to midslope elevations. The polygon includes numerous Class II and Class III watercourses. The watercourses are all within protection zones (HCP RMZ for Cl II and Forester imposed RMZ for Cl III).

Typical 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 75 and 100 feet. The outerband may be harvested but must retain a minimum of 60% canopy closure. For this unit, the entire Class II RMZ has been established as a no harvest zone.

The implemented THP mitigation for the Class III watercourses includes 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 sideslopes are greater than 50%, a 50' RMZ has been established and maintaining 75 sq. ft (or the unit wide retention standard if greater) evenly distributed in the buffer. Where side slopes are less than 50% employ a 25' RMZ that maintains 75 sq. ft (or the unit wide 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. The Class III watercourses in this unit are short extensions of the Class II watercourse and often fall with the Class II RMZ. The southern Class III has been treated with a Class II RMZ.

SHALSTAB modeling (Figure 2) shows poorly convergent and moderately inclined slopes throughout the polygon. Values do not exceed 2 and are limited to the southeastern corner of polygon.

Mass Wasting Potential (MWP) modeling for the unit is low to moderate.

Three landslides were identified within the unit. All three of the sites are legacy road related. Harvest is proposed atop the landslides, however the silviculture was adjusted to single tree selection. Harvesting within the landslides is dependent upon the merchantable number of trees within the landslide. Where activity is fairly recent, timber growth is typically young and therefore sub-merchantable. Where stability has returned, timber growth is longer and results in saw logs. These are the unstable area proposed for selective harvesting.

B) Harvest Related Impacts and Hillslope Sensitivity
Significant surface disturbance has occurred within the unit in response to past logging activites. The disturbance is the culmination of road and layout construction. Following that impact, the area appears to have adjusted through minor slumping, settling and the infrequent failure of stresses slopes. The degree of mass wasting placed sediment within the watercourses appears insignificant when compared to the construction of roads and crossings within the channels. Current planned operations will result in less ground disturbance than previous operations and are unlikely to increase potential for mass wasting-related discharge. 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. Overall hillslope sensitivity to harvest activities appears minimal with respect to mass wasting. Please see the THP geology report for a more comprehensive assessment of the role that timber harvesting has on slope stability.

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

D) Operational Design Plan
THP approved yarding method is both cable and ground based. As delineated, the proposed yarding methods appear appropriate.

THP Unit: # 1
Polygon: 1-2

A) General Observations
The polygon is essentially north-west facing and occupies ridgtetop to upper slope elevations. The polygon includes numerous Class II and Class III watercourses. The watercourses are all within protection zones (HCP RMZ for Cl II and Forester imposed RMZ for Cl III). Typical 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 75 and 100 feet. The outerband may be harvested but must retain a minimum of 60% canopy closure. For this unit, the entire Class II RMZ has been established as a no harvest zone. The implemented THP mitigation for the Class III watercourses includes 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 sideslopes are greater than 50%, a 50' RMZ has been established and maintaining 75 sq. ft (or the unit wide retention standard if greater) evenly distributed in the buffer. Where side slopes are less than 50% employ a 25' RMZ that maintains 75 sq. ft (or the unit wide 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. The Class III watercourses in this unit are short extensions of the Class II watercourse and often fall with the Class II RMZ. The southern Class III has been treated with a Class II RMZ. SHALSTAB modeling (Figure 2) shows poorly convergent and moderately inclined slopes throughout the polygon. Values do not exceed 3 and are limited to the southeastern corner of polygon and are represented as single pixels. Mass Wasting Potential (MWP) modeling for the unit is low. No landslides were identified within the unit.

B) Harvest Related Impacts and Hillslope Sensitivity
Significant surface disturbance has occurred within the unit in response to past logging activities. The disturbance is the culmination of

B) Harvest Related Impacts and Hillslope Sensitivity
road and layout construction. Following that impact, the area appears to have adjusted through minor slumping, settling and the infrequent failure of stresses slopes. The degree of mass wasting placed sediment within the watercourses appears insignificant when compared to the construction of roads and crossings within the channels. Current planned operations will result in less ground disturbance than previous operations, especially where adjacent to watercourses, and are unlikely to increase potential for mass wasting-related discharge. 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. Overall hillslope sensitivity to harvest activities appears minimal with respect to mass wasting. Please see the THP geology report for a more comprehensive assessment of the role that timber harvesting has on slope stability.

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

D) Operational Design Plan
THP approved yarding method is both cable and ground based. As delineated, the proposed yarding methods appear appropriate.

THP Unit: # 1
Polygon: 1-3

A) General Observations

This polygon has been evaluated for Tier 2 enrollment; however will not be enrolled at this time (coincident with polygons 1-1 or 1-2).

The polygon is essentially west-facing, broadly convergent and divergent slopes. Similar to the other polygons, the unit is located from the ridgetop to midslope elevations. The polygon includes numerous Class II and Class III watercourses. The watercourses are all within protection zones (HCP RMZ for Cl II and Forester imposed RMZ for Cl III).

Typical 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 75 and 100 feet. The outerband may be harvested but must retain a minimum of 60% canopy closure. For this unit, the entire Class II RMZ has been established as a no harvest zone.

The implemented THP mitigation for the Class III watercourses includes 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 sideslopes are greater than 50%, a 50' RMZ has been established and maintaining 75 sq. ft (or the unit wide retention standard if greater) evenly distributed in the buffer. Where side slopes are less than 50% employ a 25' RMZ that maintains 75 sq. ft (or the unit wide 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. The Class III watercourses in this unit are short extensions of the Class II watercourse and often fall with the Class II RMZ. The southern Class III has been treated with a Class II RMZ.

SHALSTAB modeling (Figure 2) shows poorly convergent and moderately inclined slopes throughout the polygon. Values do not exceed 2 and are limited to slopes adjacent and slightly with the Single tree RMZ for Class II watercourses.

Mass Wasting Potential (MWP) modeling for the unit is low to moderate.

No landslides were identified within the unit. The Forester has adopted three areas within the polygon as single tree selection to further reduce the potential for harvest related mass wasting.

B) Harvest Related Impacts and Hillslope Sensitivity

Significant surface disturbance has occurred within the unit in response to past logging activites. The disturbance is the culmination of road and layout construction. Following that impact, the area appears to have adjusted through minor slumping, settling and the infrequent failure of stresses slopes.

The degree of mass wasting placed sediment within the watercourses appears insignificant when compared to the construction of roads and crossings within the channels.

Current planned operations will result in less ground disturbance than previous operations, especially where adjacent to watercourses, and are unlikely to increase potential for mass wasting-related discharge.

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.

Overall hillslope sensitivity to harvest activities appears minimal with respect to mass wasting.

Please see the THP geology report for a more comprehensive assessment of the role that timber harvesting has on slope stability.

C) Forestry / Silviculture Plan

We have not changed the silviculture in response to this evaluation.

D) Operational Design Plan

THP approved yarding method is both cable and ground based. 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.

SGD, 2008, Geologic Evaluation of the Moss Elk THP, Humboldt County, California, unpublished report to Wayne Rice RPF, Scotia Pacific Company LLC, dated April 30, 2008. Included within section V of the THP 1-08-072.

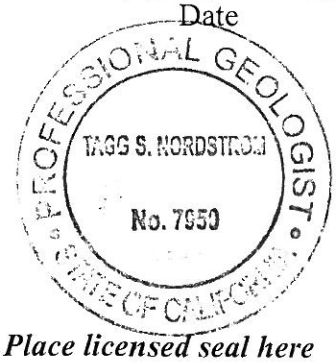
Brief descriptions of the models used in this evaluation:

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 (Name), P.G. 7950 (license #), 3/17/10 (Date),



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. 1-09-018 HUM (North Ridge) 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. R1-2006-0103, 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.

Table 1. Proposed 2010 Harvest in Freshwater Creek.

				Silviculture					Hazard	
	THP Name	THP Number	Unit Number	CC	ROW	shr	SEL	CC Equivalent	Low	High*
15-May	Becks 2010	10-??	1				270	135.0	TBD	TBD
1-May	Ridge Meander	09-010	1 TII				89.1	44.6	82.7	24.6
4-Jan	Ridge Meander	09-010	2 TI				37.7	18.9	37.7	0.0
1-May	Ridge Meander	09-010	3 TII				90.3	45.2	88.3	7.7
4-Jan	Ridge Meander	09-010	1A TI				37.1	18.6	37.1	0.0
4-Jan	Ridge Meander	09-010	1B TI				36.1	18.1	35.4	2.7
4-Jan	Ridge Meander	09-010	3A T1				24.1	12.1	24.1	0.0
15-May	little little	10 -??	All		2.7		58.8	31.4	57	6.9
15-May	City Dump	05-006	1				14.8	7.4	14.8	0.0
15-May	City Dump	05-006	2				7.7	3.9	7.7	0.0
15-May	City Dump	05-006	3			38.9	5.8	32.1	44.7	9.6
15-May	City Dump	05-006	4				9.8	4.9	7	10.8
15-May	City Dump	05-006	5			1	0	0.8	0.1	3.5
15-May	City Dump	05-006	6				8	4.0	5.6	9.2
15-May	City Dump	05-006	7			4.4	0	3.3	4.2	0.8
							Total	379.9		

*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).

Total Clear Cut Equivilant Acres enrolled or submitted for enrollment	379.9

Table 2. Summary of THPs to enrolled prior to establishment of Zero Discharge Monitoring Plan for Freshwater Creek

		Harvest	Hazard	
THP Number	Unit Number	Acres	Low	High*
Ridge Meander	2 TI	37.7	37.7	0.0
Ridge Meander	1A TI	37.1	37.1	0.0
Ridge Meander	1B TI	36.1	35.4	2.7
Ridge Meander	3A T1	24.4	24.1	0.0
Totals		135.3	137.0	

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

			Yarding System			Site Preparation	
THP Name	THP Number	Unit Number	Ground Based	Yarder	Helicopter	Mechanical	Broadcast
Becks	10-??	1	TBD	TBD		0	0
Ridge Meander	09-010	1 TII	27.1	62			
Ridge Meander	09-010	2 TI	3.2	34.5			
Ridge Meander	09-010	3 TII	14.9	75.4			
Ridge Meander	09-010	1A TI		37.1			
Ridge Meander	09-010	1B TI		36.1			
Ridge Meander	09-010	3A T1	3	21.1			
little little	10 -??		17.9	49.2			
City Dump	05-006	1	14.8	0			
City Dump	05-006	2	0	7.7			
City Dump	05-006	3	44.7	0			
City Dump	05-006	4	7.1	2.7			
City Dump	05-006	5	0	1			
City Dump	05-006	6	5	3			
City Dump	05-006	7	0	4.4			

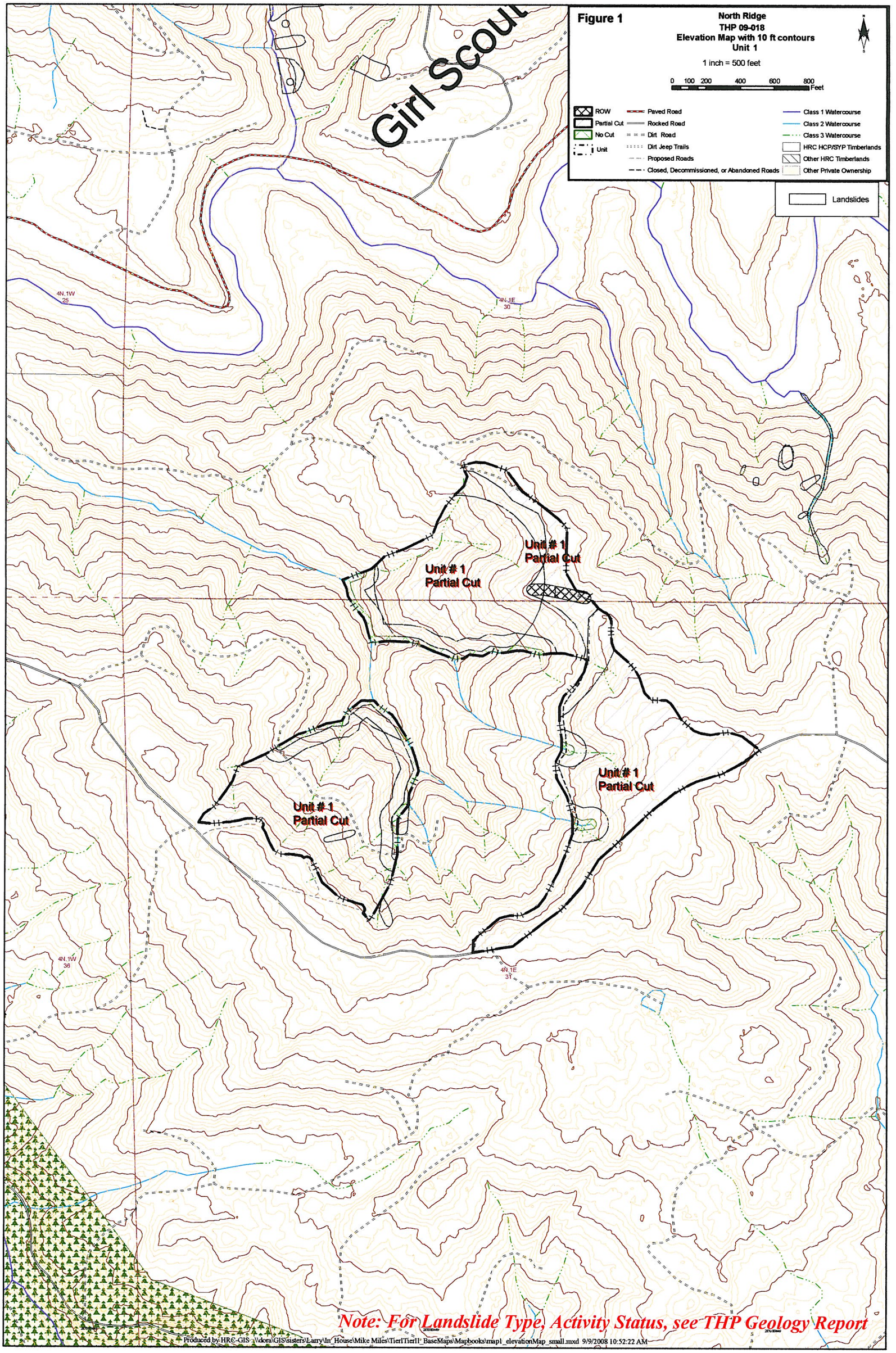
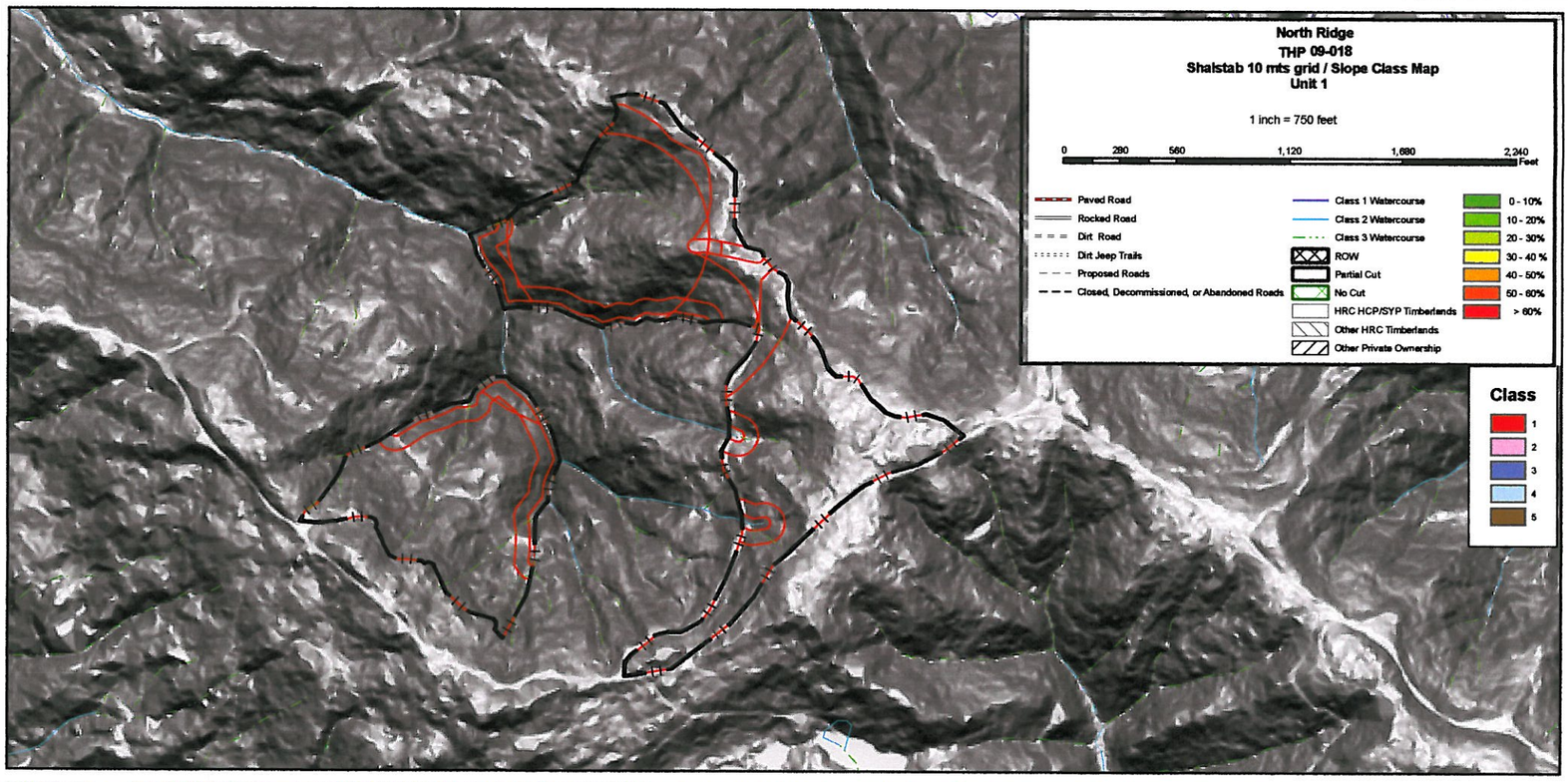
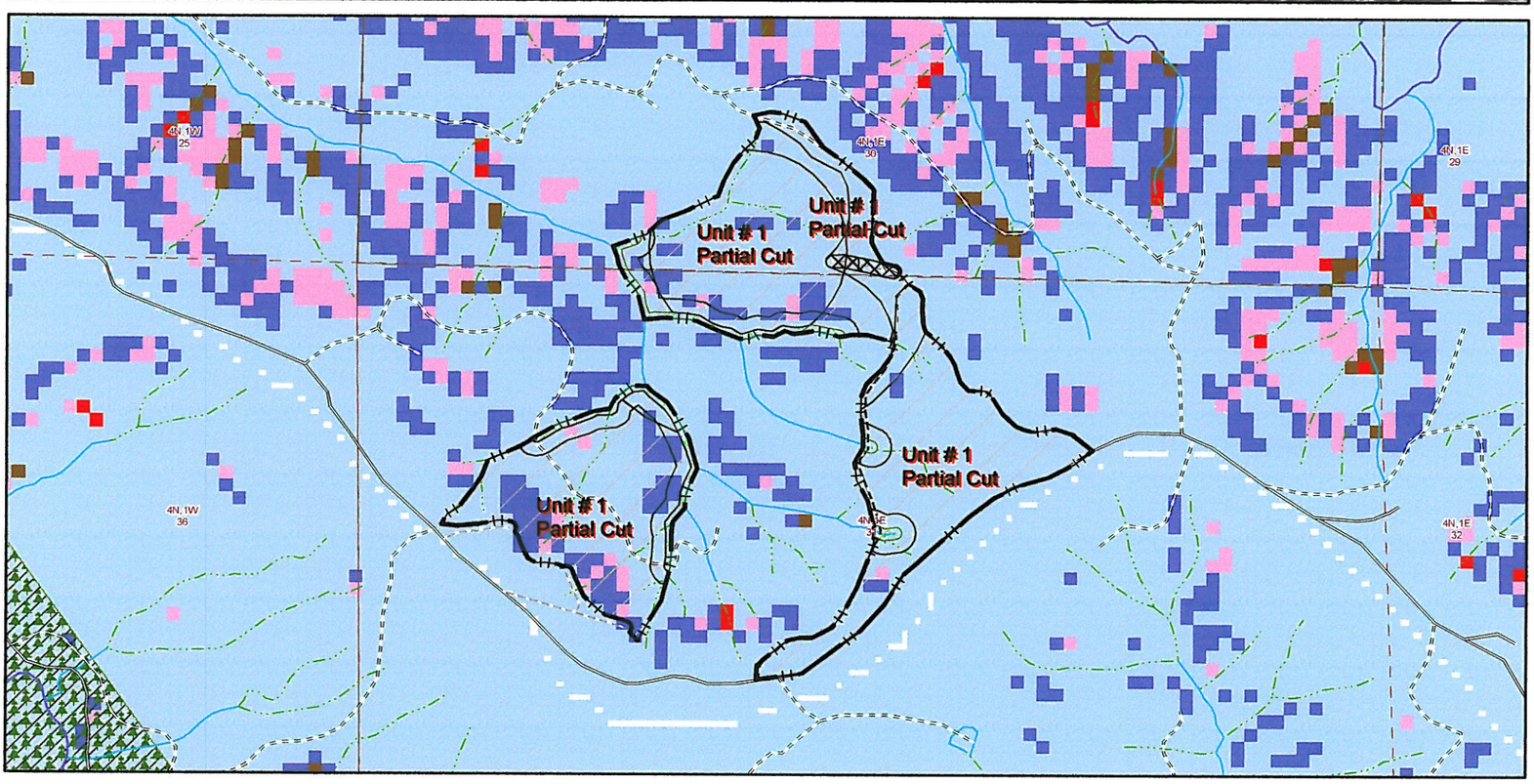
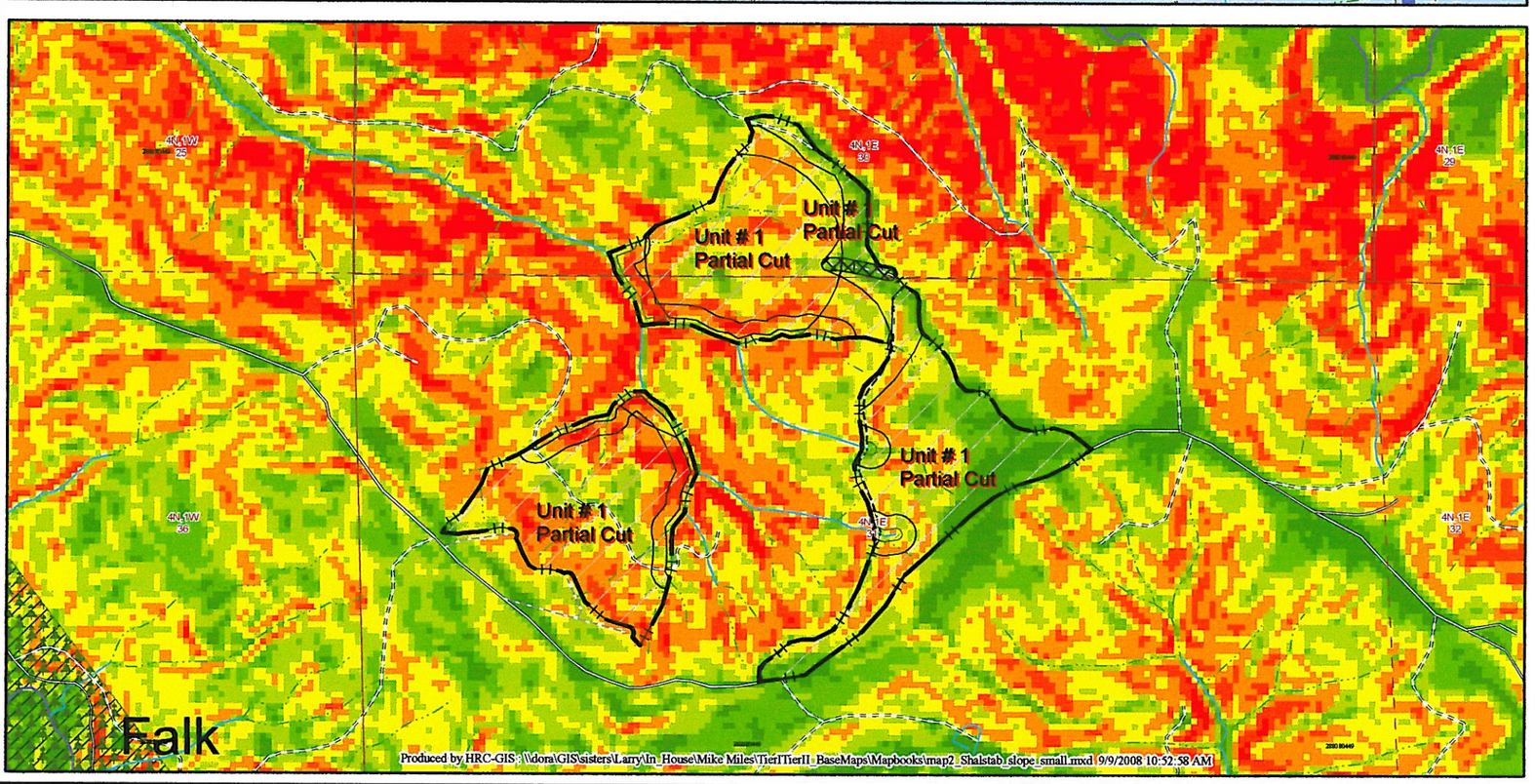


Figure 1
North Ridge
THP 09-018
Elevation Map with 10 ft contours
Unit 1
1 inch = 500 feet
0 100 200 400 600 800
Feet
ROW
Partial Cut
No Cut
Unit
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
Landslides
Girl Scout
4N,1W 25
4N,1E 30
4N,1W 36
4N,1E 31
Unit # 1 Partial Cut
Unit # 1 Partial Cut
Unit # 1 Partial Cut
Unit # 1 Partial Cut
Note: For Landslide Type, Activity Status, see THP Geology Report
Produced by HRC-GIS :\\dora\GIS\sisters\Larry\ln_House\Mike Miles\TierITierII*_BaseMaps\Mapbooks\map1_elevationMap_small.mxd 9/9/2008 10:52:22 AM


North Ridge
THP 09-018
Shalstab 10 mts grid / Slope Class Map
Unit 1
1 inch = 750 feet
0 280 560 1,120 1,680 2,240
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
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
4N,1W
25
4N,1E
30
4N,1E
29
4N,1W
36
4N,1E
31
4N,1E
32


Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
4N,1W
25
4N,1E
30
4N,1E
29
4N,1W
36
4N,1E
31
4N,1E
32
Falk
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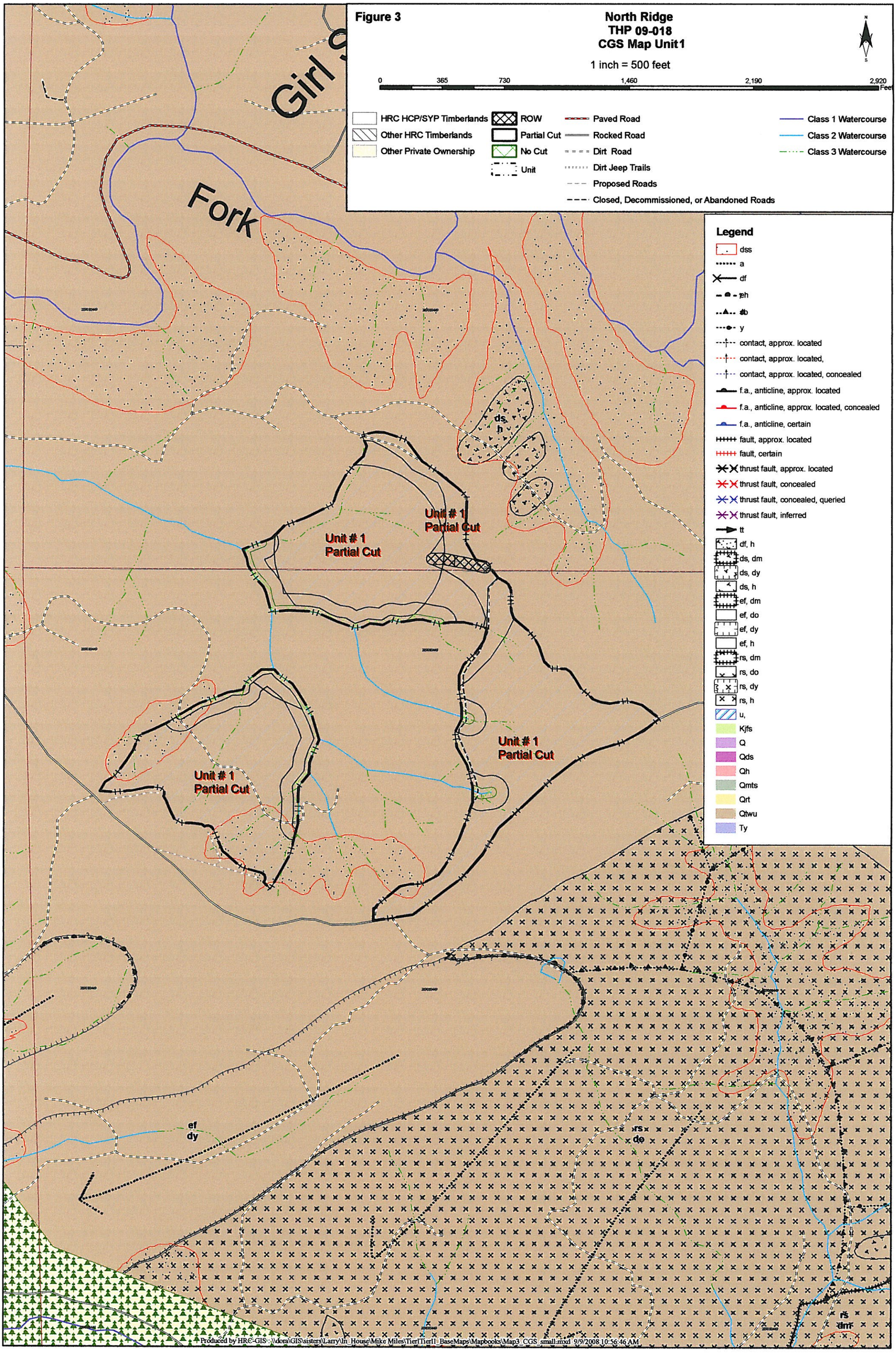
Figure 3
North Ridge
THP 09-018
CGS Map Unit1
1 inch = 500 feet
0
365
730
1,460
2,190
2,920
Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Unit
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
Girl S
Fork
Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
ds
h
ef
dy
rs
do
rs
dm
Legend
dss
a
df
eh
db
y
contact, approx. located
contact, approx. located,
contact, approx. located, concealed
f.a., anticline, approx. located
f.a., anticline, approx. located, concealed
f.a., anticline, certain
fault, approx. located
fault, certain
thrust fault, approx. located
thrust fault, concealed
thrust fault, concealed, queried
thrust fault, inferred
tt
df, h
ds, dm
ds, dy
ds, h
ef, dm
ef, do
ef, dy
ef, h
rs, dm
rs, do
rs, dy
rs, h
u,
Kjfs
Q
Qds
Qh
Qmts
Qrt
Qtwu
Ty
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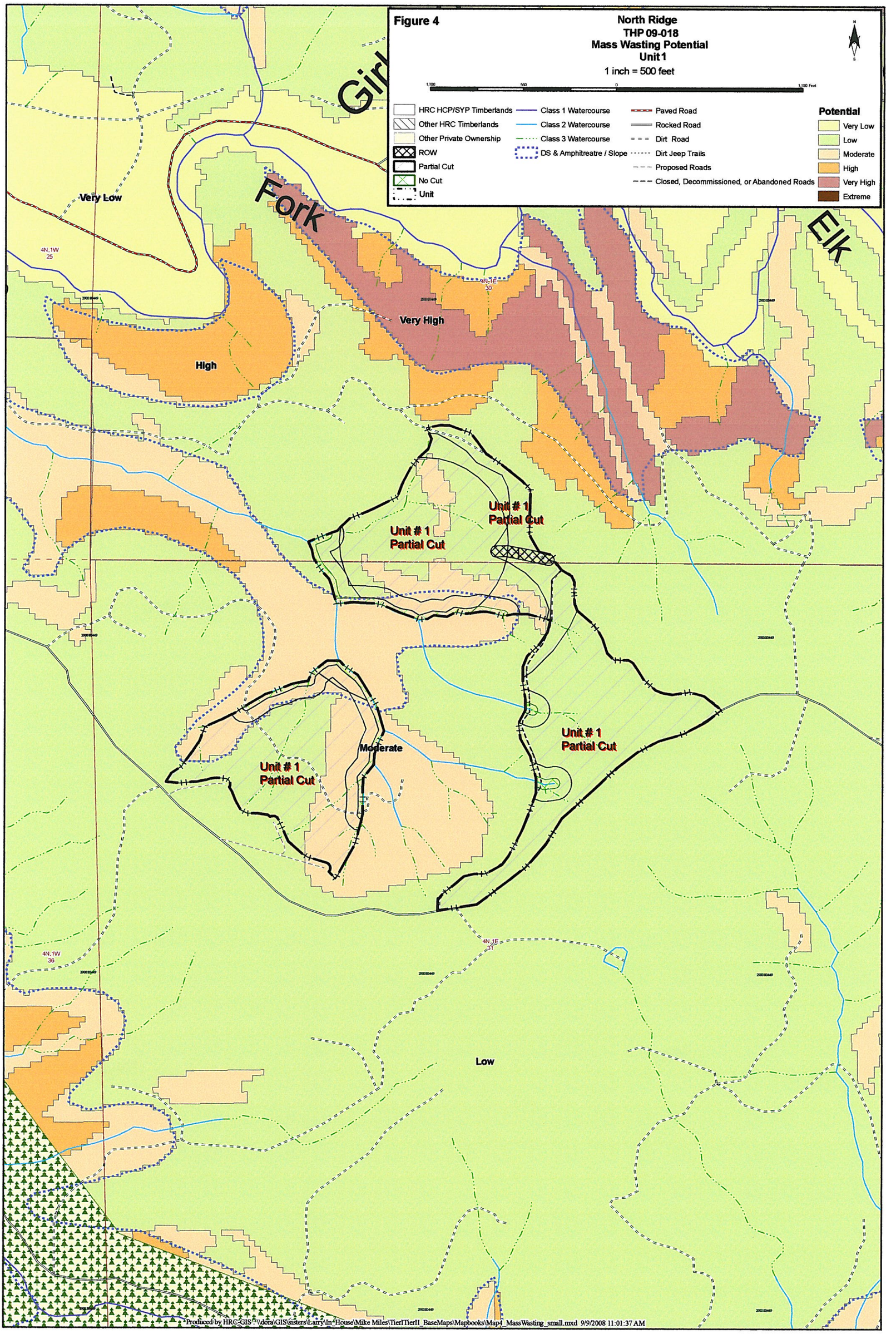
Figure 4
North Ridge
THP 09-018
Mass Wasting Potential
Unit 1
1 inch = 500 feet
1,000 500 0 1,000 Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Unit
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
DS & Amphitreatre / Slope
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Potential
Very Low
Low
Moderate
High
Very High
Extreme
Fork
Elk
Very Low
High
Very High
Moderate
Low
Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
4N,1W
25
4N,1E
30
4N,1W
36
4N,1E
31
*Produced by HRC GIS: \\dora\GIS\sisters\Larry\In-House\Mike Miles\TierITierII_BaseMaps\Mapbooks\Map4_MassWasting_small.mxd 9/9/2008 11:01:37 AM

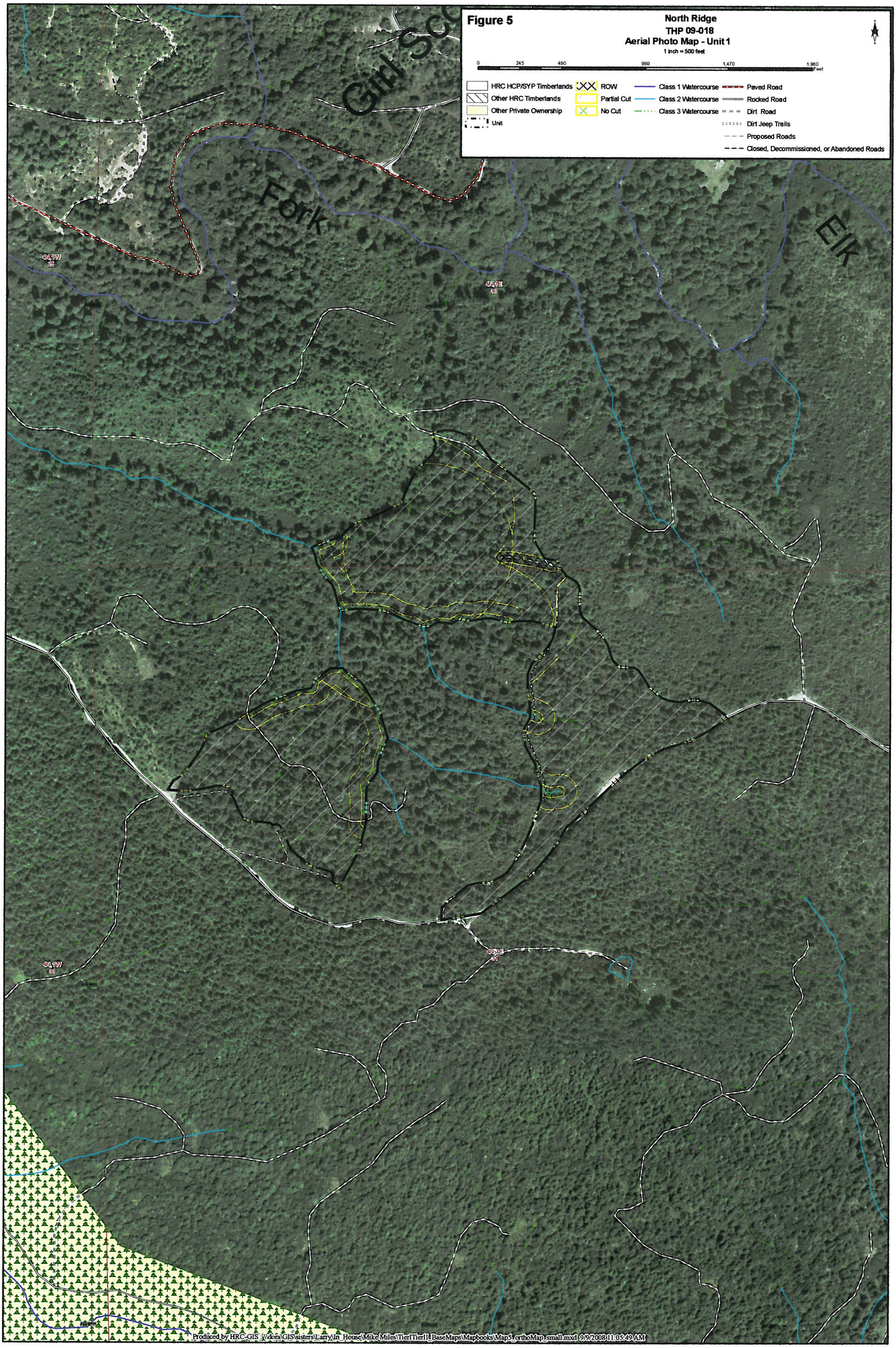
Figure 5
North Ridge
THP 09-018
Aerial Photo Map - Unit 1
1 inch = 500 feet
0
245
490
980
1,470
1,960
Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
Unit
ROW
Partial Cut
No Cut
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Fork
Elk
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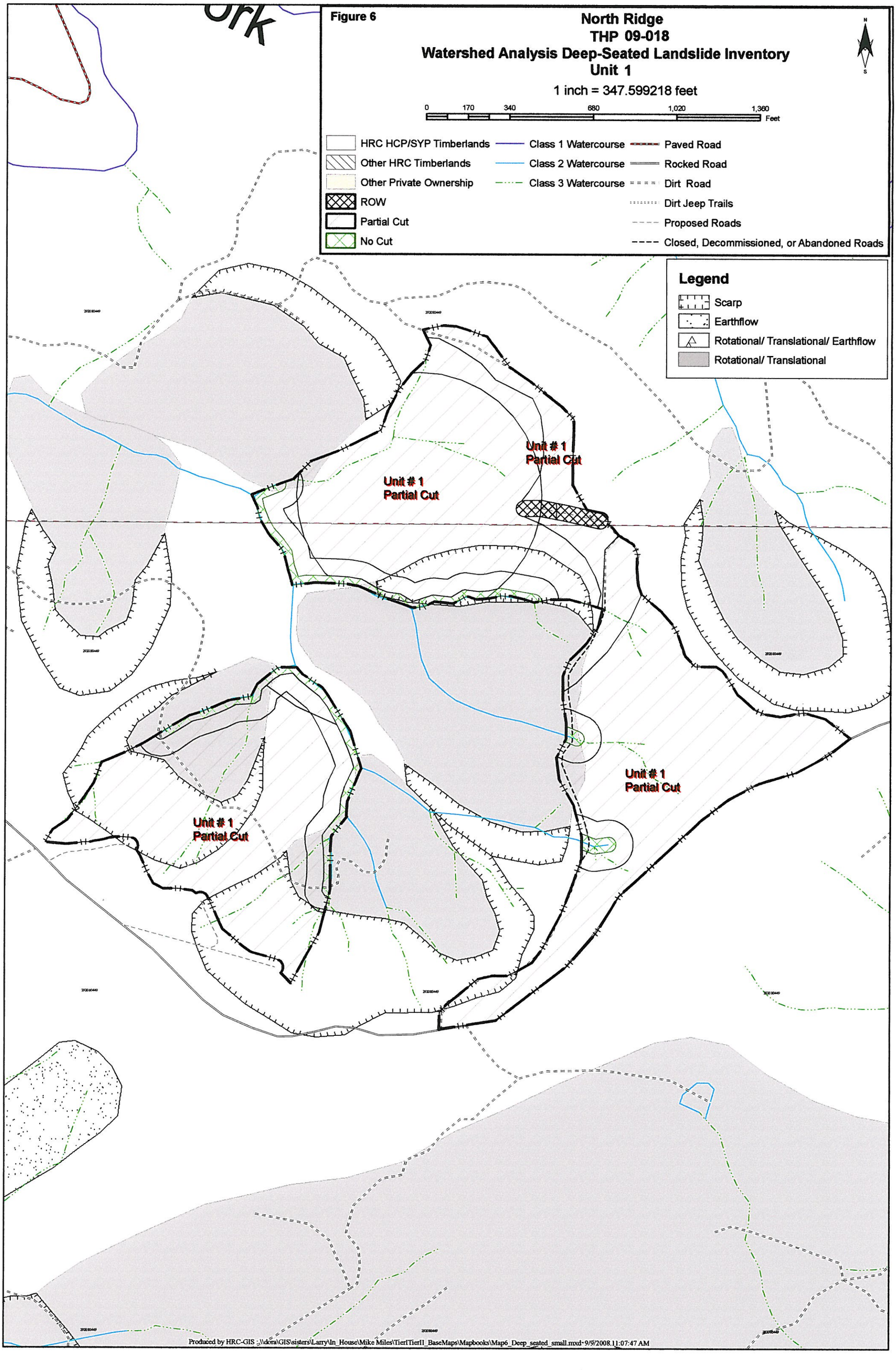
Figure 6
North Ridge
THP 09-018
Watershed Analysis Deep-Seated Landslide Inventory
Unit 1
1 inch = 347.599218 feet
0 170 340 680 1,020 1,360
Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Legend
Scarp
Earthflow
Rotational/ Translational/ Earthflow
Rotational/ Translational
Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
Unit # 1
Partial Cut
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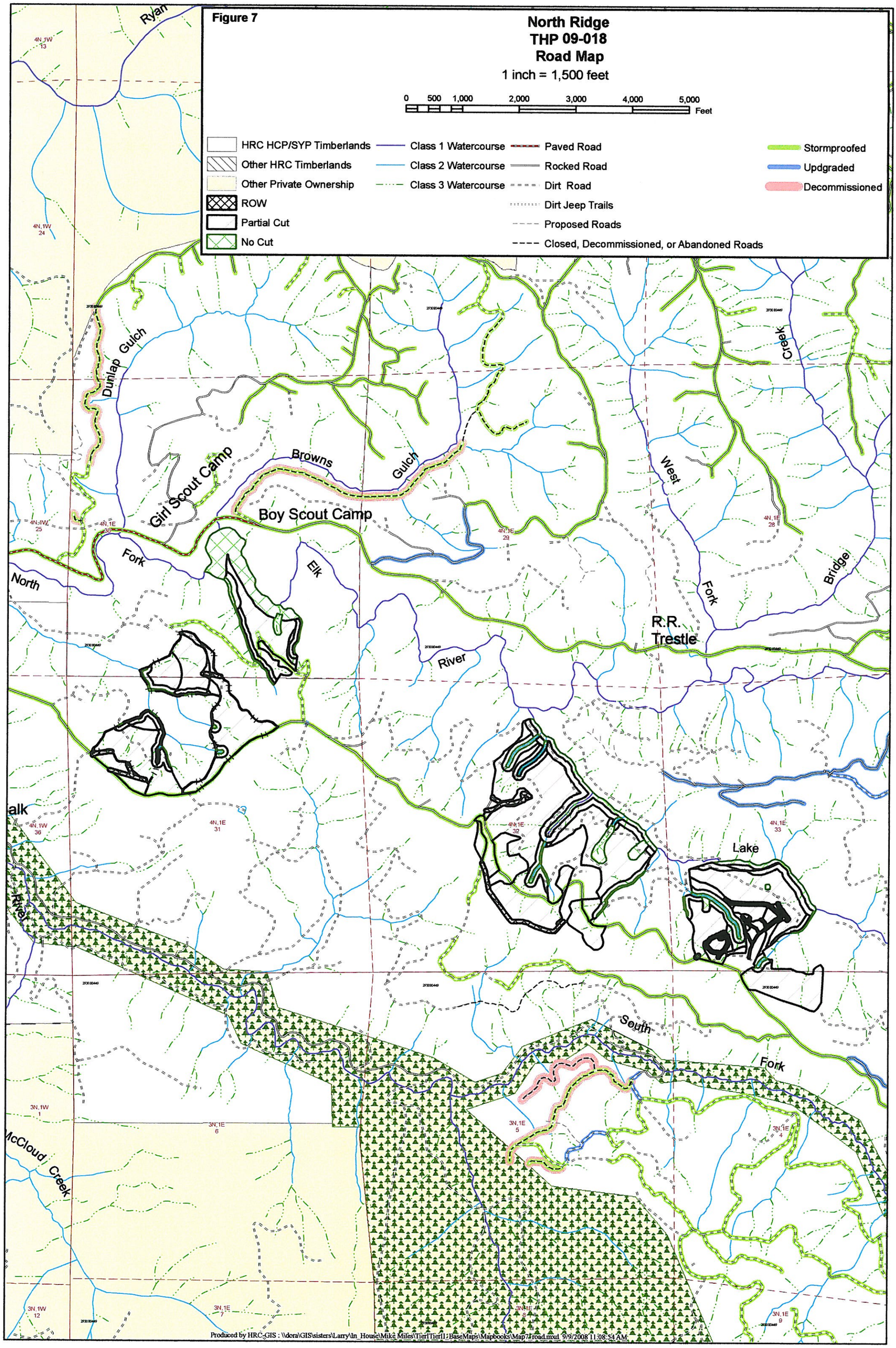
Figure 7
North Ridge
THP 09-018
Road Map
1 inch = 1,500 feet
0 500 1,000 2,000 3,000 4,000 5,000
Feet
HRC HCP/SYP Timberlands
Other HRC Timberlands
Other Private Ownership
ROW
Partial Cut
No Cut
Class 1 Watercourse
Class 2 Watercourse
Class 3 Watercourse
Paved Road
Rocked Road
Dirt Road
Dirt Jeep Trails
Proposed Roads
Closed, Decommissioned, or Abandoned Roads
Stormproofed
Updgraded
Decommissioned
Ryan
Dunlap Gulch
Girl Scout Camp
Browns Gulch
Boy Scout Camp
North Fork Elk River
West Fork Bridge Creek
R.R. Trestle
Lake
South Fork
McCloud River
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