

STATE FOREST LAND
SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

Questions in italics are supplemental to Ecology's standard environmental checklist. They have been added by the DNR to assist in the review of state forest land proposals. Adjacency and landscape/watershed-administrative-unit (WAU) maps for this proposal are available on the DNR internet website at <http://www.dnr.wa.gov/state-environmental-policy-act-sepa>. These maps may also be reviewed at the DNR regional office responsible for the proposal. This checklist is to be used for SEPA evaluation of state forest land activities.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. BACKGROUND

1. Name of proposed project, if applicable:

Timber Sale Name: **LUGNUT**

Agreement # **93898**

2. Name of applicant: **Washington Department of Natural Resources**

3. Address and phone number of applicant and contact person:

DNR Northwest Region

Contact Person: Laurie Bergvall

919 N. Township Street

Telephone: 360-856-3500

Sedro-Woolley, WA 98284

360-856-3500

4. Date checklist prepared: **07/19/2016**

5. Agency requesting checklist: **Washington Department of Natural Resources**

6. Proposed timing or schedule (including phasing, if applicable):

a. Auction Date: **02/22/2017**

b. Planned contract end date (but may be extended): **03/31/2019**

c. Phasing: **Not Applicable**

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Timber Sale:

a. Site preparation:

Harvest units may be treated with herbicides prior to planting. Assessment for treatment will occur after completion of harvest.

b. Regeneration Method:

Hand plant with conifer seedlings within the first two years after completion of harvest. Stocking level will meet or exceed Forest Practices standards.

c. Vegetation Management:

Treatment to be assessed in 3 to 5 years. Competing vegetation may be treated by manual cutting and/or herbicide.

d. Thinning:

The need for a pre-commercial thinning will be assessed in 10 to 15 years. A commercial thinning is possible in 25 to 45 years.

Roads:

The **CSB-40, SP-ML, and SP-02** roads will be used for future management activities.

Proposed temporary roads that will be abandoned upon completion of the harvest may be reopened for future management activities.

Rock Pits and/or Sale:

The **SP-0202 HARD ROCK PIT** will be used for future management activities.

No rock sources will be developed within Riparian Management Zones (RMZ), Wetland Management Zones (WMZ), or other sensitive areas. Onsite rock may be used for road construction if rock sources are discovered along haul routes or within the sale area.

Other:

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- 303 (d) – listed water body in WAU: temp sediment completed TMDL (total maximum daily load):
- Landscape plan:
- Watershed analysis:
- Interdisciplinary team (ID Team) report:
- Road design plan:
- Wildlife report: Wildlife Memos from Lisa Egtvedt, dated July 1, 2016 and August 2, 2016
- Geotechnical report:
- Other specialist report(s): Wetlands Memo from Sabra Hull, dated August 19, 2016, and Geology Memo from John McKenzie, dated September 2, 2016
- Memorandum of understanding (sportsmen's groups, neighborhood associations, tribes, etc.):
- Rock pit plan: Available at Northwest Region Office
- Other: State Soil Survey, 1992; Policy for Sustainable Forests, December 2006; Final Habitat Conservation Plan (HCP) & Environmental Impact Statement, September 1997; Cultural Resource Inadvertent Discovery Guidelines Procedure; Forest Practices Informal Conference Notes # NW-ICN-16-135503.

All available at Northwest Region Office.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None known.

10. List any government approvals or permits that will be needed for your proposal, if known.

- FPA # FHFA Burning permit Shoreline permit Incidental take permit
- Existing HPA Other:

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects

of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

a. *Complete proposal description:*

The Lugnut timber sale is a three-unit variable retention harvest (VRH). The original area considered for this proposal was approximately 230 acres; this has been reduced to 199 gross acres due to operational feasibility as well as wetland and stream buffers. Approximately 1.6 acre of right-of-way will also be harvested in adjacent riparian management zones (RMZ). After deducting the acreage of leave tree clumps and existing road rights-of-way and adding the new rights-of-way the area was reduced to 182.6 net acres. The sale is bounded by DNR managed lands and private lands. The sale area was designed to be harvested with ground-based and cable systems.

Estimated sale volume is 5,684 MBF

The SP-0202 Hard Rock Pit will be utilized in this proposal. Road work will be completed as part of this proposal, as listed in A.11.c.

b. *Timber stand description pre-harvest (include major timber species and origin date), type of harvest, overall unit objectives.*

Pre-Harvest Stand Conditions:

- **Unit 1**
- **76 years old**
- **Top Height 142 feet tall**
- **Basal area 290 square feet per acre**
- **Stand composition: Douglas-fir - 26% western hemlock - 54% western redcedar - 5% hardwoods – 15% by basal area**

- **Unit 2**
- **67 years old**
- **Top Height 152 feet tall**
- **Basal area 319 square feet per acre**
- **Stand composition: Douglas-fir - 20% western hemlock - 50% western redcedar - 21% hardwoods – 9% by basal area**

- **Unit 3**
- **44 years old**
- **Top Height 127 feet tall**
- **Basal area 199 square feet per acre**
- **Stand composition: Douglas-fir - 91% western hemlock - 7% western redcedar - 2% hardwoods – <1% by basal area**

Type of Harvest:

- Variable retention harvest (VRH) with retention of an average of eight trees per acre greater than or equal to ten inches in diameter breast height (DBH). Leave trees are scattered and grouped in leave tree clumps.
- This proposal is on State managed lands. Harvest removals will occur via ground-based systems, with the possibility for cable operations.

Overall Unit Objectives:

- Generate revenue for State Trust beneficiaries.
- Protect water quality, maintain site productivity, maintain and enhance wildlife habitat through a legacy tree retention strategy. This proposal meets or exceeds all of the guidelines set forth in the DNR Habitat Conservation Plan, Policy for Sustainable Forests, and Forest Practices Rules and Regulations.

Wildlife Objectives:

- **VRH Harvest:** The general wildlife objective is to minimize immediate impact to current wildlife populations while retaining some unique characteristics for future wildlife habitat needs. Leave tree areas were designed to contain trees resistant to wind throw, while protecting relatively unique features such as snags, large down woody debris, large and structurally unique trees, riparian and wet areas. Many leave trees were selected for their future snag retention potential. Leave trees are representative of the proposed sale timber type, which consists predominately of conifer species. Snags will be left where possible and if they meet the Washington State Department of Labor and Industry Safety Guidelines.

c. Road activity summary. See also forest practice application (FPA) for maps and more details.

Type of Activity	How Many	Length (feet) (Estimated)	Acres (Estimated)	Fish Barrier Removals (#)	Steepest Side Slope Road Crosses
Construction		0	N/A		N/A
Reconstruction		40*		0	10
Abandonment		7,680		0	50
Temporary Construction		10,006***			50
Pre-haul Maintenance		25,270			
Bridge Install/Replace	1	40			
Culvert Install/Replace (fish)	0				
Culvert Install/Replace (no fish)	4**				

*Reconstruction consists of bridge replacement

**This refers to only typed stream crossings and does not include relief culverts.

***Of the length listed for Temporary Construction in the above table, zero feet up to the entire length listed may be built.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. (See site plan and topographic maps on DNR website: <http://www.dnr.wa.gov/state-environmental-policy-act-sepa> Click on the DNR region under "Current SEPA Actions – Timber Sales.")

a. Legal description: :

**Township 28 North Range 08 East Sections 12, 13, 14, 15, 16
Township 28 North Range 09 East Sections 06, 07**

b. Distance and direction from nearest town (include road names):

The proposal is located approximately 5.8 miles northeast of Sultan off of Sultan Basin Road.

c. Identify the names of all watershed administrative units (WAU). (See also landscape/WAU map on DNR website <http://www.dnr.wa.gov/state-environmental-policy-act-sepa> under the topic "Current SEPA Project Actions – Timber Sales" for a broader landscape perspective.)

WAU Name	WAU Acres
Olney Creek	19802
Sultan River	23383

13. Discuss any known future activities not associated with this proposal that may result in a cumulative change in the environment when combined with the past and current proposal(s). (See digital ortho-photos for WAU and adjacency maps on DNR website <http://www.dnr.wa.gov/state-environmental-policy-act-sepa> for a broader landscape perspective.)

Information based on Department GIS reports dated August 18, 2016.

WAU Name	Acres	DNR-Managed Lands	Other Acres	% DNR Managed Land	% Other Land	% of proposal in WAU
Olney Creek	19,802	8,930	10,872	45.1	54.9	87
Sultan River	23,383	12,917	10,466	55.2	44.8	13

Past and Future DNR Activities in WAU

DNR Managed Lands – Past Harvests

The following table reports timber harvest activity in these WAUs within the past seven years on both DNR managed lands and non-DNR lands. The data was compiled from the Department's Forest Practices' Geographical Information System (GIS) database, report dated August 18, 2016.

Forest Practices Approved Applications for Harvest Activities

WAU	DNR harvest acres: even-aged	DNR harvest acres: uneven-aged	Non-DNR harvest acres: even-aged	Non-DNR harvest acres: uneven-aged
Olney Creek	449	2	865	5
Sultan River	1,339	17	443	461

Note: This information is derived from activity locations collected by varying methods ranging from hand drawn maps to precise GPS collection. No verification of map accuracy or activity completion is conducted. Totals may not be the sum of all harvest types due to overlapping activities. The same land may be counted more than once if, in the past seven years, more than one forest practice application has been approved for different harvests (even-age for example).

DNR Managed Lands - Future Harvests

The following data was reported in the Department's GIS database on August 18, 2016. No attempt was made to predict future timber harvests on private land. The current proposal acreage is not included in the future harvest acreage in these WAUs.

WAU	Estimated DNR harvest acres of proposals through 2023
Olney Creek	3,283
Sultan River	2,579

Future forest management activities in these WAUs include road building, rock pit expansion, silvicultural work and timber harvesting. Activities occurring on DNR managed land will follow Forest Practices Rules, Habitat Conservation Plan (HCP) guidelines, and the Policy for Sustainable Forests – policies designed to minimize environmental impacts. Future forest management activities on privately managed, non-DNR lands will be subject to the Forest Practices Rules.

The Department's Habitat Conservation Plan (HCP) outlines strategies to protect Federally listed threatened and endangered species, and species that are in danger of being listed in the future, as well as uncommon habitat types found on forest lands in western Washington. HCP riparian buffers intended to protect salmon and trout habitat were applied to this proposal, and will be applied to all future sales in the vicinity. The HCP identifies large, structurally unique trees and snags as uncommon habitats that need to be protected. An average of 8 trees per acre will be left in the proposed VRH harvest units. These trees will function for future snag and large structurally unique tree recruitment.

Under the Interim Strategy for the Marbled Murrelet in the North Puget Planning Unit, under the Department's HCP, several stands in these WAUs have been deferred from timber harvest to provide habitat. The Interim Strategy also requires Department field staff to search for and delineate any "newly identified" marbled murrelet habitat in the vicinity of any proposed timber sales. These stands may be deferred from timber harvest throughout the remainder of the Interim Strategy (with occasional exceptions made to allow road and/or yarding access into non-habitat areas), and may be considered to be left un-harvested for a longer period of time under the Department's yet-to-be-developed Long-Term Strategy for marbled murrelets. DNR field staff have delineated the proposal and adjacent areas, and have found there to be no suitable habitat within

the proposal. There is newly identified Criteria 3 suitable habitat adjacent to the proposal. A region biologist has verified field staff delineations.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (check one):

Flat, Rolling, Hilly, Steep Slopes, Mountainous, Other:

1) *General description of the WAU or sub-basin(s)(landforms, climate, elevations, and forest vegetation zone).*

Olney Creek WAU

Olney Creek divides the Olney Creek WAU. The WAU has an average of 62 inches annual precipitation. The south and southwest area of the Olney WAU consist of generally rolling terrain with some steep slopes leading into incised stream channels that feed Olney Creek. The north and northeast portions generally are mountainous terrain characterized by steep slopes from major ridgelines. Elevations in this region of the WAU vary from 800 feet in Olney Creek to 4,811 feet at ridge tops, while slopes vary from 40% to 80%. Olney Creek flows southward through the WAU. Approximately 31% of the total WAU acreage falls within the SROS zone.

The Olney Creek WAU is affected by a maritime climate, with cool wet winters and mild summers. The greater part of the WAU is within the westside western hemlock zone, the largest vegetation zone in western Washington. Most of the forest stands in this zone are composed primarily of western hemlock with western redcedar in lower, wetter areas and Douglas-fir in higher, drier ones and sometimes intermixed with Pacific silver fir. Red alder, black cottonwood and bigleaf maple can also be found in smaller concentrations throughout the WAU.

The Sultan River WAU

The Sultan River WAU is divided by the Sultan River. It has an average of 55 inches of annual precipitation. The southwestern portion of the WAU is gently rolling terrain with occasional steeper slopes. Much of this portion has been developed for residential and agricultural uses. The central portion of the WAU is generally rolling terrain with occasional deep, incised gorges carrying major tributaries. The central portion of the WAU includes the major tributary of Marsh Creek. Elevations in this portion range from 600 to 2,300 feet. Slopes average 25% to 55% with some in excess of 70%. The eastern portions of the river valley start at low elevations and rise to steep mountainous terrain. Elevations in this portion range from 600 to 3,094 feet at the top of Blue Mountain. Slopes average 40% to 55% with some in excess of 70%. Western hemlock and Douglas-fir dominate most of the forest stands in the Sultan River WAU. Approximately 14% of the total WAU acreage falls within the SROS zone.

The Sultan River WAU is affected by a maritime climate, with cool wet winters and mild summers. The greater part of the WAU is within the westside western hemlock zone, the largest vegetation zone in western Washington. Most of the forest stands in this zone are composed primarily of western hemlock with western redcedar in lower, wetter areas and Douglas-fir in higher, drier ones. Red alder, black cottonwood and bigleaf maple can also be found in smaller concentrations throughout the WAU.

- 2) Identify any difference between the proposal location and the general description of the WAU or sub-basin(s).

The proposal area is consistent with the general description of the WAU.

- b. What is the steepest slope on the site (approximate percent slope)?

The site generally does not exceed 90% slope. There is a small near vertical rock outcrop with slopes up to 195%. No management activity will occur on the face of the outcrop.

- c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Note: The following table is created from state soil survey data. It is a roll-up of general soils information for the soils found in the entire sale area. It is only one of several site assessment tools used in conjunction with actual site inspections for slope stability concerns or erosion potential. It can help indicate potential for shallow, rapid soil movement, but often does not represent deeper soil sub-strata. The actual soils conditions in the sale area may vary considerably based on land-form shapes, presence of erosive situations, and other factors. The state soil survey is a compilation of various surveys with different standards.

State Soil Survey #	Soil Texture	% Slope	Mass Wasting Potential	Erosion Potential
8113	Gravelly Loam	30-60	Medium	Medium
5714	Gravelly Loam	3-15	Insignificant	Low
8105	Gravelly Loam	8-15	Insignificant	Low
8116	Gravelly Loam	3-30	Insignificant	Low
9146	Gravelly Loam	15-30	Insignificant	Medium
1956	Rock Complex	30-65	No Data	No Data
7409	Gravelly Loam	0-30	Insignificant	Medium

2461*	Silt Loam	30-60	Medium	High
9136	Gravelly Loam	0-8	Insignificant	Low

* Potential impact to soils with high mass wasting and erosion potentials will be mitigated by using low ground pressure tracked machines.

- d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

1) *Surface indications:*

There are some surface indications of potentially unstable soils in the WAUs but not within this proposal. Most of them occur in riparian areas and are in the form of inner gorges.

The statewide landslide inventory (LSI) screening tool indicates no presence of polygons mapped as landslides within the proposed harvest unit boundaries. This landslide database is maintained by the Washington Department of Natural Resources, Forest Practices Division. The LSI includes landslides mapped during many different projects including large-scale geologic mapping, watershed analyses, landscape planning, and landslide hazard zonation, in addition to other case studies and mapping efforts. A large majority of landslides identified by these projects are mapped by remote review with minimal field verification. In addition, dormant and ancient deep-seated landslides are mapped in many projects included in the LSI. A large number of the remotely identified landslides and deep-seated features have been mapped with a questionable, probable, or unknown certainty. As a result, the LSI database is meant to be used as a screening tool and field verification is a necessary step in confirming the absence, presence, and extent of mapped features, as well as their actual level of activity/instability.

A Forest Practice Landslide Hazard Zone of moderate probability overlaps the north portion of Unit 3. The geologist reviewed the area in the office and the forester found no indications of instability in the field.

Two landslides adjacent to the northwest corner of Unit 2 were identified by the State Lands Geologist and found to be dormant. They are also completely bound out of the timber sale. The Licensed Engineering Geologist, a qualified expert, found that the proposal will have no impact on the landslides. See Geology Memo dated September 2, 2016.

An inner gorge feature is located south of Unit 1, falls well within the no-harvest stream buffer.

There is an LSI polygon (ID#28935) approximately 500 feet north of Unit 3. The state lands geologist, a Forest Practices Qualified Expert was consulted. The feature is separated from the harvest unit by an intervening drainage and is hydrologically disconnected from the unit.

2) *Is there evidence of natural slope failures in the sub-basin(s)?*

No Yes, type of failures (shallow vs. deep-seated) and failure site characteristics:

The Olney Creek and Sultan River WAUs have had past landslides in steep drainages that flow into rivers and creeks. There is evidence of small shallow slope failures along some of the stream reaches in steep draws that have formed by cutting through glacial till, or originate in headwall areas of steep drainages.

3) *Are there slope failures in the sub-basin(s) associated with timber harvest activities or roads?*

No Yes, type of failures (shallow vs. deep-seated) and failure site characteristics:

Associated management activity:

Shallow failures of side-cast fill roads has occurred in steep hillside terrain. Such failures are less likely to occur with current road building and harvest practices. Current Forest Practices regulations and HCP guidelines protect streams with buffers and leave trees. Culverts used on current roads are sized for 100-year flood.

4) *Is the proposed site similar to sites where slope failures have occurred previously in the sub-basin(s)?*

No Yes, describe similarities between the conditions and activities on these sites:

Sites that have had slope failures within the sub-basin(s), have historically been associated with road construction through areas containing steep slopes and convergent topography. No road construction associated with this proposal will occur in areas with steep convergent topography.

5) *Describe any slope stability protection measures (including sale boundary location, road, and harvest system decisions) incorporated into this proposal.*

The proposal area was office-reviewed by a DNR State Lands Licensed Engineering Geologist who meets the Forest Practices definition of a "Qualified Expert". The boundary of the inner gorge feature, south of Unit 1, falls well within the no-harvest stream buffer, and therefore was bounded out of the proposal area. The deep seated landslides northwest of Unit 2 were field reviewed by the same Geologist. The entire slope is within the no-harvest stream buffer, and therefore was bounded out of the proposal area. See Geology Memo dated September 2, 2016. The Forest Practice Landslide Hazard Zone of moderate probability which overlaps the north portion of Unit 3 was office-reviewed by the geologist and the forester found no indications of instability in the field.

Harvest boundaries were laid out with the intent of ground-based and cable harvest systems. Roads were designed to minimize ground-based yarding distance. Roads are mostly located on gentle terrain or reuse abandoned road prisms. Roads on steeper slopes are located on rock. A Forest Practices pre-application review was conducted. See ICN#NW-ICN-16-135503

- e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Approx. acreage new roads: 3.4 Approx. acreage new landings: 0.7 Fill Source: Native fill or rock

Road construction will utilize standard cut and fill methodology, full bench construction with end haul or side cast to obtain grade and alignment. Native soil and rock will be excavated from the road prism and used for fill in the sub-grade and over cross drains and stream crossings.

- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Road construction will expose bare soil. Road plan requirements include the use of grass seed or other revegetation methods to protect exposed soils from erosion.

- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? *Approximate percent of proposal in permanent road running surface (includes gravel roads):*

Less than 3 percent of the site will be covered with permanent new rock covered (gravel) roads.

- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: *(Include protection measures for minimizing compaction or rutting.)*

RMZ and WMZ buffers as described in B.3.a.1.b and B.3.a.1.c will be retained.

All roads will be constructed to meet or exceed Forest Practices standards and the Habitat Conservation Plan guidelines. Appropriate drainage devices including proper culvert size and placement, drain dips, water bars and ditching, will be used as necessary to reduce surface erosion. In areas adjacent to constructed roads where soil disturbances have occurred, straw mulch, grass seed or some other appropriate measure will be used to prevent sediments from being transported.

2. Air

- a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Minor amounts of engine exhaust from logging equipment and dust from vehicle traffic and logging equipment are expected while the project is active. Following harvest, logging slash debris may be accumulated into piles and then burned.

- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None known.

- c. Proposed measures to reduce or control emissions or other impacts to air, if any:

If slash burning occurs, it will be in adherence to the Washington State Smoke Management Plan.

3. Water

- a. Surface Water:

- 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. (see timber sale map available at DNR region office, or forest practice application base maps.)

- a. *Downstream water bodies:*

All streams and wetlands associated with this proposal are tributaries of the Skykomish River.

- b. *Complete the following riparian & wetland management zone table:*

Wetland, Stream, Lake, Pond, or Saltwater Name (if any)	Water Type	Number (how many?)	Avg RMZ/WMZ Width in feet (per side for streams)
Olney Creek	1	1	162 feet
Unnamed Stream	3	3	162 feet
Unnamed Stream	4	7	100 feet
Unnamed Stream	5	23	30-foot Equipment Limitation Zone
Wetland (greater than 1 Ac.)	Forested	1	180 feet

- c. *List RMZ/WMZ protection measures including silvicultural prescriptions, road-related RMZ/WMZ protection measures, and wind buffers.*

Type 3 streams adjacent to the sale area are protected with 162-foot no-harvest site index buffers. Due to topographic site conditions, it was determined that wind buffers were not necessary.

Type 4 streams adjacent to the sale area have 100-foot no-harvest buffers.

Type 5 streams within the sale area have 30-foot equipment limitation zones,

except at designated crossings. The crossings will be as close to perpendicular as possible and may require log cribbing, culvert installation, or other approved methods to be in place to protect channels and banks. Timber will be felled and yarded away from all streams when possible. New road construction crossing type 5 streams will have Best Management Practices applied during hauling to ensure that excessive ditchwater and runoff will not enter or otherwise adversely affect water quality. Exposed soils will be revegetated.

Wetlands greater than 1 acre are protected with a 180-foot, no-harvest site index buffer (average width). See Wetlands Memo from Sabra Hull, dated June 17, 2016.

Ditchwater will be diverted through relief culverts prior to stream crossing to keep sediment out of stream. All existing roads through RMZs/WMZs will have Forest Practices Best Management Practices applied during hauling to ensure that excessive ditchwater and runoff will not enter or otherwise adversely affect water quality. New construction was located to avoid crossing typed waters where possible. Exposed soils will be grass seeded.

A special non-invasive grass mixture will be used to reseed roads in the vicinity of the WMZ and heavy road abandonment methods will be used to maintain local hydrology patterns. See road plan for further details.

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No Yes (See RMZ/WMZ table above and timber sale map available at DNR region office.)

Description (include culverts):

Timber will be felled immediately adjacent to the WMZ/RMZs described in the table in B.3.a.1.b. Timber will be felled away from the WMZ/RMZs where practical in order to avoid damage to trees within the WMZ/RMZs. See B.3.a.1.c.

New, temporary, road construction will take place over three type 4 streams, and one type 5 stream. Ground-based equipment may cross type 5 streams at designated crossing locations. All culverts will be removed during road abandonment unless a section of road is retained for future access purposes.

Ditchwater will be diverted through relief culverts or make use of topographic controls prior to stream crossings to keep sediment out of streams. Exposed soils will be revegetated. See Road Plan and Specifications for this proposal (available at the Northwest Region Office) for more information.

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected.

Indicate the source of fill material.

Approximately sixty cubic yards of rock will be placed on an abandoned road surface in the vicinity of a wetland (about a tenth of an acre in size) located at the northern terminus of the SP-ML road. The rock will be removed prior to contract termination and the site re-contoured and treated appropriately to manage for wetland hydrology and ecology.

Culverts will be placed at stream crossings so that no fill will be placed directly into the water.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. (*Include diversions for fish-passage culvert installation*).

No Yes, description:

All water flow may be temporarily diverted through bypass culverts or retained behind (or pumped around) coffer dams during culvert and bridge installations. Typed waters may be temporarily diverted, if culvert replacement is deemed necessary, through the course of operations on typed water crossing on existing roads.

At the bridge installation site, temporary fish exclusion methods may be used to minimize impacts to fish and achieve the same goal of minimizing sediment delivery without diverting the flow. This will happen during the hydraulics project approved timing window, in accordance with procedures listed in the road plan.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No Yes, describe location:

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No Yes, type and volume:

- 7) *Does the sub-basin contain soils or terrain susceptible to surface erosion and/or mass wasting? What is the potential for eroded material to enter surface water?*

Yes. The following data was reported in the Department's WAU report database on August 15, 2016. This data is not available by sub-basin.

Olney Creek WAU: soil data may not be available for 100% of the WAU

EROSION POTENTIAL	ACRES	% IN WAU
HIGH	3106.3	15.7
MEDIUM	2093.5	10.6
LOW	9355.2	47.2
VARIABLE	6.6	0
NODATA	2854.7	14.4
N/A	1528.2	7.7

MASS WASTING POTENTIAL	ACRES	% IN WAU
HIGH	498	2.5
MEDIUM	5002.4	25.3
LOW	439.4	2.2
INSIGNIFICANT	10143.4	51.2
NO DATA	2854.7	14.4

Sultan River WAU: soil data may not be available for 100% of the WA

EROSION POTENTIAL	ACRES	% IN WAU
HIGH	2249	9.6
MEDIUM	1644.2	7
LOW	15252.1	65.2
VARIABLE	36.3	0.2
NO DATA	2733.4	11.7
N/A	782.5	3.3

MASS WASTING POTENTIAL	ACRES	% IN WAU
HIGH	603.5	2.6
MEDIUM	3018	12.9
LOW	82.8	0.4
INSIGNIFICANT	16223.5	69.4
NO DATA	2733.4	11.7

- 8) *Is there evidence of changes to the channels in the WAU and sub-basin(s) due to surface erosion or mass wasting (accelerated aggradations, erosion, decrease in large organic debris (LOD), change in channel dimensions)?*

No Yes, describe changes and possible causes:

At the WAU and sub-basin level, there is some evidence of aggradations and channel scouring from naturally occurring erosion.

- 9) *Could this proposal affect water quality based on the answers to the questions 1-8 above?*

No Yes, explain:

This proposal includes both the harvest of timber and road work. The removal of overstory vegetation will temporarily reduce interception of water and increase infiltration and saturation of water into the forest floor which could temporarily increase overland flow.

RMZ and WMZ buffers and other operational control measures ensure that any overland flow from disturbed soil areas will filter through substantial amounts of forest floor vegetation before entering any perennial stream channels. (See B.3.a.1.b, B.1.h and B.1.d.5)

Road work disturbs surface soils; some temporary surface erosion is likely to occur, especially with the first winter rains following road work at relief culvert installation locations and road abandonment related culvert removal locations. Culvert installations and removals will follow Forest Practices Rules and RMAP

requirements to minimize any erosion-related water quality impacts. See questions B.1.h, B.3.a.1.c, and B.3.d for a partial listing of some of the specific erosion protection measures.

10) What are the approximate road miles per square mile in the WAU and sub-basin(s)? Are you aware of areas where forest roads or road ditches intercept sub-surface flow and deliver surface water to streams, rather than back to the forest floor?

No Yes, describe:

Olney Creek: 5.1 miles of road/square mile

Sultan River: 5.5 miles of road/square mile

Based on DNR's WAU reports dated August 18, 2016. The numbers reported are for all ownerships within the WAU, and are not available at the sub-basin level.

11) Is the proposal within a significant rain-on-snow (ROS) zone? If not, **STOP HERE** and go to question B-3-a-13 below. Use the WAU or sub-basin(s) for the ROS percentage questions below.

No Yes, approximate percent of sub-basin(s) in significant ROS zone:

Or, approximate percent of WAU:

Based on DNR's WAU reports dated August 18, 2016.

The proposal is located within the following sub-basins in the SROS zone:

Olney Creek WAU, sub-basin 6 – 48.16% in the SROS zone

Olney Creek WAU, sub-basin 1 – 0% in the SROS zone

Olney Creek WAU, sub-basin 4 – 14.24% in the SROS zone

Sultan River WAU, sub-basin 6 – 19.92% in the SROS zone

12) If the proposal is within the significant ROS zone, what is the approximate percentage of the WAU or sub-basin(s) within the significant ROS zone (all ownerships) that is (are) rated as hydrologically mature?

Based on DNR's WAU reports dated August 18, 2016.

The proposal is located within the following sub-basins:

Olney Creek WAU, sub-basin 6 – 68.8% is hydrologically mature

Olney Creek sub-basin 6 does meet the criteria for a critical sub-basin, but will remain in surplus of its hydrologically mature condition after the proposed harvest occurs.

Olney Creek WAU, sub-basin 1 – 0% is in the significant ROS zone

Olney Creek WAU, sub-basin 4 – 14.24% is in the significant ROS zone

Sultan River WAU, sub-basin 6 – 19.92% is in the significant ROS zone

Olney Creek sub-basins 1 and 4 and Sultan River sub-basin 6 have less than 33.33% acreage in the significant ROS zone and therefore do not meet the criteria for a critical sub-basin.

WAU or sub-basin	ROS acres (DNR) within the sub-basin	% sub-basin in significant ROS zone	DNR HCP-managed forest land acres in ROS	% DNR HCP-managed forest land in ROS	% DNR managed lands rated hydrologically mature
Olney Creek sub-basin 6	2,732	48.16%	2,331	85.3%	68.8%
Olney Creek sub-basin 1	0	0%	0	0%	100%
Olney Creek sub-basin 4	357	14.24%	74	20.86%	56.22%
Sultan River sub-basin 6	881	19.92%	881	100%	58.71%

It is not readily known what the hydrologic maturity is on other ownerships.

13) *Is there evidence of changes to channels associated with peak flows in the WAU and sub-basin(s)?*

No

Yes, describe observations in the WAU and in the sub-basin(s):

Channel changes have occurred at the WAU level. It is difficult to separate the effects of peak stream flow increases from the effects of mass wasting in stream channels. The effects are interrelated and often occur during the same storm events (See B.3.a.8).

14) *Based on your answers to questions B-3-a-10 through B-3-a-13 above, describe whether and how this proposal, in combination with other past, current, or reasonably foreseeable proposals in the WAU and sub-basin(s), may contribute to a peak flow impact.*

This proposal may slightly change the timing, duration, and amount of peak flow. Flow rates may increase slightly during low and high flow periods due to decreased transpiration and interception during the first decade of new forest growth. To minimize impacts, riparian buffers will be established on type 3 and 4 streams and on all wetlands over one-quarter acre, and prudent road-building techniques will be followed. (See B.3.a.1.b, B.3.a.1.c, B.3.a.2, B.3.a.9, and B.1.h)

15) *Is there water resource (public, domestic, agricultural, hatchery, etc.), or area of slope instability, downstream or downslope of the proposed activity that could be affected by changes in surface water amounts, quality, or movements as a result of this proposal?*

No

Yes, possible impacts:

The Skykomish River system is located downstream of the proposal area. It is not likely that the water quality will be affected due to the distance between the proposal

area and the Skykomish River. There is a WDFW fish hatchery at the confluence of Olney Creek and the Wallace River located near the city of Sultan, WA.

- 16) *Based on your answers to questions B-3-a-10 through B-3-a-15 above, note any protection measures addressing possible peak flow/flooding impacts.*

As stated in B.3.a.14, this proposal is not expected to cause a damaging increase in peak flows. In order to minimize the risk of road failures during peak flow events, all culverts utilized in new road construction will be sized to withstand a 100-year flood event. Culverts and ditches will be maintained so that they remain functional. Storm patrols will be conducted as necessary on existing and newly constructed roads to identify and address potential erosion problems.

b. Ground Water:

- 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Runoff from road surfaces will be diverted to stable areas on the forest floor through the uses of ditches, culverts, and energy dissipaters. The proposed activity is expected to have no impact on ground water. No ground water will be withdrawn from a well.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Minor amounts of oil, fuel and other lubricants may inadvertently be discharged to the ground as a result of heavy equipment use or mechanical failure. No lubricants will be disposed of on site.

- 3) *Is there a water resource use (public, domestic, agricultural, hatchery, etc.), or area of slope instability, downstream or down slope of the proposed activity that could be affected by changes in groundwater amounts, timing, or movements as a result this proposal?*

No Yes, describe:

There is a WDFW fish hatchery at the confluence of the Wallace River and May Creek located between the cities of Sultan and Startup, WA.

- a. *Note protection measures, if any.*
See B.3.b.1.

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Runoff from road surfaces will be diverted to stable areas on the forest floor through the use of ditches, culverts, and energy dissipaters.

- 2) Could waste materials enter ground or surface waters? If so, generally describe.

No Yes, describe:

It is not anticipated that waste material will enter ground or surface water as a result of this proposal. See also B.3.b.2 and B.7.a.

a. Note protection measures, if any.

Existing regulations and contract requirements regarding spill prevention and waste cleanup will be followed. (See also B.3.a.1.c and B.3.c.1)

- 3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

This proposal is not expected to alter drainage patterns in the vicinity of the site.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

(See surface water, ground water, and water runoff sections above, questions B-3-a-1-c, B-3-a-16, B-3-b-3-a, and B-3-c-2-a.)

Constructed ditches, cross-drain culverts, drain dips, and water bars will be used to control runoff. Straw mulch, grass seeding, or other appropriate methods may be used on any soil exposed on cut and fill slopes during the course of this proposal in order to prevent sediment movement. Roads and landings will be crowned to avoid water accumulation. Falling and yarding away from all seasonal streams will be applied where feasible. All activities associated with this proposal will meet or exceed Forest Practices standards and will follow the Habitat Conservation Plan. (See also B.1.d.5 and B.1.h)

4. Plants

- a. Check the types of vegetation found on the site:

deciduous tree:

- alder, maple, aspen, cottonwood, western larch, birch,
other: willow, cherry
- evergreen tree:
- Douglas fir, grand fir, Pacific silver fir, ponderosa pine, lodgepole pine, western hemlock, mountain hemlock, Englemann spruce, Sitka spruce, red cedar, yellow cedar, other:
- shrubs:
- huckleberry, salmonberry, salal, other: blackberry
- grass
pasture
crop or grain
wet soil plants:
- cattail, buttercup, bullrush, skunk cabbage, devil's club,
other:
- water plants:
- water lily, eelgrass, milfoil, other:
- other types of vegetation:
plant communities of concern:

b. What kind and amount of vegetation will be removed or altered? (See answers to questions A-11-a, A-11-b, B-3-a-1-b and B-3-a-1-c. The following sub-questions merely supplement those answers.)

1) Describe the species, age, and structural diversity of the timber types immediately adjacent to the removal area. (See color landscape/WAU and adjacency maps on the DNR website: <http://www.dnr.wa.gov/state-environmental-policy-act-sepa> (Click on the DNR region under the Topic "Current SEPA Project Actions - Timber Sales."))

The proposal is surrounded by other DNR managed lands and private lands. Adjacent DNR lands consist of similar timber species and forest types, but vary in age and structure relative to the removal area.

2) Retention tree plan:

Each unit will have an average of eight leave trees per acre remaining on site upon completion of harvest activities. Leave trees will be both scattered and in leave tree clumps.

Retained trees will provide wildlife habitat, older forest components, and a seed source to surrounding areas. This will ensure that trees best suited to the site, and/or which exhibit desirable wildlife habitat characteristics will be retained. The units will be planted with conifer seedlings at a stocking level that meets or exceeds Forest Practices standards.

c. List threatened and endangered *plant* species known to be on or near the site.

None found in DNR's TRAX database search on July 26, 2016. The Washington Natural Heritage Program (WANHP) GIS layer was reviewed on July 26, 2016. No rare plant species or communities were found. No threatened or endangered plant species were identified during field work for this proposal.

- d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:
- An average of eight leaf trees per acre will be clumped and scattered throughout the proposal.
 - RMZs will be retained on all type 3 and 4 streams.
 - WMZs will be retained on all forested wetlands greater than 0.25 acres.
 - Harvest units will be planted with conifer species.
 - Exposed soils, due to road construction, will be grass seeded.
- e. List all noxious weeds and invasive species known to be on or near the site.

No noxious or invasive plant species were found in database search of DNR's TRAX system, July 26, 2016. However, Himalayan blackberry, Evergreen Blackberry, and Butterfly Bush have been found in small amounts on or near the site.

5. Animals

- a. List any birds and other animals or unique habitats which have been observed on or near the site or are known to be on or near the site. Examples include:

birds: hawk, heron, eagle, songbirds, pigeon, other: marbled murrelet

mammals: deer, bear, elk, beaver, other: bobcat

fish: bass, salmon, trout, herring, shellfish, other:

unique habitats: talus slopes, caves, cliffs, oak woodlands, balds, mineral springs

Marbled Murrelet: Criteria 3 newly-identified suitable marbled murrelet habitat within ¼ mile of Units 1 & 2.

Cliff: Adjacent to Unit 2.

Goshawk: nest site several thousand west of Unit 1.

- b. List any threatened and endangered species known to be on or near the site *include federal- and state-listed species*.
DNR's TRAX system indicates no known threatened, or endangered species on or near the proposal site. Database searched July 26, 2016.

- c. Is the site part of a migration route? If so, explain.

Pacific flyway Other migration route: Explain if any boxes checked:

All of Washington State is considered part of the Pacific Flyway. No impacts are anticipated as a result of this proposal.

d. Proposed measures to preserve or enhance wildlife, if any:

Note existing or proposed protection measures, if any, for the complete proposal described in question A-11.

Species/Habitat:

Stream and wetland riparian habitat

Protection Measures:

All activities associated with this proposal will meet or exceed Forest Practices standards and the Habitat Conservation Plan. See also B.1.h., B.3.a.1., B.3.a.2., B.3.a.3., B.3.a.4., B.3.a.9., B.3.c., B.3.d., and B.4.d.

Species/Habitat:

Criteria 3 newly-identified suitable marbled murrelet habitat within ¼ mile of Units 1 & 2.

Protection Measures:

Timing restrictions will be implemented in portions of units 1 and 2. Timing restrictions will be implemented for any activity associated with harvesting timber, road building, and rock pit development. Harvest activities include but are not limited to: falling, yarding, loading, running chainsaws, or running heavy equipment. The timing restrictions will be in effect from April 1 through August 31, from one hour before to two hours after official sunrise, and one hour before to one hour after official sunset.

Species/Habitat:

Cliff

Protection Measures:

A vertical rock face that is more than 25 feet tall, therefore considered a “cliff” under the HCP, is located immediately adjacent to Unit 2. This cliff was evaluated by a region biologist. It was determined not to contain any habitat features. This feature is within the adjacent no-harvest WMZ.

Species/Habitat:

Goshawk

Protection Measures:

The nest site and alternate nests are located well outside of the harvest units. Surveys were conducted in 2012 and 2013 which determined that the site was no longer active.

e. List any invasive animal species known to be on or near the site.

No invasive animal species were identified during field work for this proposal, and none were found in database search of DNR’s TRAX system on July 26, 2016.

6. Energy and natural resources

- a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.
Does not apply.
- b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.
Does not apply.
- c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:
Does not apply.

7. Environmental health

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal?
There is minimal anticipated hazard from heavy equipment operations. There is a slight chance of hydraulic or oil spills from equipment operating on the site. There is also a potential fire hazard if operations occur in moderate to severe fire weather conditions during summer months. The timber sale contract contains language that addresses hazardous materials spill prevention; hazardous material spill containment, control and cleanup; hazardous material release reporting. If any toxic or hazardous chemical spill occurs, or if past contamination is discovered, the Department of Ecology will be notified. The contract also contains language for operations during fire season.

If so, describe.

- 1) Describe any known or possible contamination at the site from present or past uses.
None known.
- 2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.
None known.
- 3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.
Petroleum products such as gasoline, diesel, grease, and hydraulic fluid may be used and stored during the operating life of this project. In addition, various herbicides may be used on the site for vegetation management.
- 4) Describe special emergency services that might be required.
 - **Firefighting by the DNR, possibly supported by local fire districts.**
 - **Emergency medical and/or ambulance service for personal injuries.**

- **Responses by the Department of Ecology if a spill were to occur.**
- 5) Proposed measures to reduce or control environmental health hazards, if any:
Safe operation of all equipment will be encouraged. Industrial restrictions and precaution levels regarding forest fire protection will be enforced. The timber purchaser will be required to have fire suppression equipment on site during the restricted fire season while harvest activity is ongoing operations will cease if relative humidity falls below 30%.

b. Noise

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?
None.
- 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Noise from rock drilling/crushing machinery, rock blasting, road building, and logging equipment such as chain saws, yarding whistles, and log/dump trucks will increase during periods of operation, typically occurring between 4 a.m. and 5 p.m. on weekdays, on a short-term basis. Noise from log hauling will be present along the haul routes during operations.

- 3) Proposed measures to reduce or control noise impacts, if any:
Noise associated with harvest and road construction activity will be minimal anywhere but in the immediate vicinity of the proposal. Harvest activity and log hauling are ordinary activities in the area and noise should not be present above customary levels.

8. Land and shoreline use

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. *(Site includes the complete proposal, e.g. rock pits and access roads.)*
The site and much of the surrounding area is commercial forest land. No existing easements should be impacted by proposal activities.
- b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The site has previously been used as working forest land, and it will continue to be used as working forest land throughout and following this proposal.

- 1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

The harvesting activities associated with this proposal are consistent with the current practices occurring within the surrounding forest land.

- c. Describe any structures on the site.
None.
- d. Will any structures be demolished? If so, what?
No.
- e. What is the current zoning classification of the site?
Commercial Forest Land
- f. What is the current comprehensive plan designation of the site?
Commercial forestry
- g. If applicable, what is the current shoreline master program designation of the site?
Not applicable.
- h. Has any part of the site been classified as a critical area by the city or county? If so, specify.
No.
- i. Approximately how many people would reside or work in the completed project?
Not applicable.
- j. Approximately how many people would the completed project displace?
Not applicable.
- k. Proposed measures to avoid or reduce displacement impacts, if any:
Not applicable.
- l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:
The proposal is consistent with current land use designations and zoning regulations.
- m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:
None.

9. Housing

- a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.
Not applicable.
- b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.
Not applicable.
- c. Proposed measures to reduce or control housing impacts, if any:
Not applicable.

10. Aesthetics

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?
Not applicable.
- b. What views in the immediate vicinity would be altered or obstructed?

1) *Is this proposal visible from a residential area, town, city, developed recreation site, or a scenic vista?*

No Yes, viewing location:

2) *Is this proposal visible from a major transportation or designated scenic corridor (county road, state or interstate highway, US route, river, or Columbia Gorge SMA)?*

No Yes, scenic corridor name: **Sultan Basin Road**

3) *How will this proposal affect any views described in 1) or 2) above?*

This proposal will add to the existing matrix of multi-cohort forestland across the landscape. Within the vicinity of this proposal, there are many large tracts of State and privately managed forestlands which have been actively managed for decades.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Leave trees and riparian buffers will remain on the landscape after completion of the variable retention harvest. Additionally, the proposal area will be planted with conifer trees within two years of the completion of harvest activities. This sale does not represent a significant departure from usual and common activities.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Not applicable.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not applicable.

c. What existing off-site sources of light or glare may affect your proposal?

Not applicable.

d. Proposed measures to reduce or control light and glare impacts, if any:

Not applicable.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Informal recreational use throughout the area may include hunting, fishing, mountain biking, camping, hiking, target shooting, and horseback riding.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Use of trails and other recreational areas immediately adjacent to and within the proposal units may be temporarily restricted during active harvest operations for safety concerns. No permanent displacement of existing designated or informal recreational opportunities will occur as a result of this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

13. Historic and cultural preservation

- a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.
No.
- b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.
No.
- c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. **A field and office review of the proposal site was conducted by a Cultural Resources Technician on July 18, 2016. No resources were found. The Tulalip Tribes, Stillaguamish Tribe of Indians, and Snoqualmie Indian Tribe were contacted on July 20, 2016. The Stillaguamish Tribe responded with no interest. No other response has yet to be received. The Department of Archaeology and Historic Preservation (DAHP) has also been provided an opportunity to review the proposal area.**
- d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. **Any other cultural resources identified during operations will be protected. Should other archaeological materials or cultural items be discovered during the course of operations, we will comply with DNR's Cultural Resource Inadvertent Discovery Guidelines.**

14. Transportation

- a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. **The site is served by Sultan Basin Road. There will be no addition of public roads to access the site or as a result of this proposal.**
 - 1) *Is it likely that this proposal will contribute to an existing safety, noise, dust, maintenance, or other transportation impact problem(s)?*
No.
- b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?
No.
- c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?
Not applicable.
- d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).
New forest roads will be constructed as part of this proposal. See question A.11.c.

- 1) *How does this proposal impact the overall transportation system/circulation in the surrounding area, if at all?*

This proposal will have very little impact on the overall transportation system as all new construction will occur on state managed land. A slight increase in truck traffic will be evident on county roads in the area during active operations.

- e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

- f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The completed project will generate less than one vehicular trip per day on average. Up to 30 vehicular trips per day could occur during peak harvest activities. These trips would occur primarily between the hours of 4 a.m. and 5 p.m. on weekdays.

- g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

All movement of forest products will be along established haul routes.

- h. Proposed measures to reduce or control transportation impacts, if any:

None.

15. Public services

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No.

- b. Proposed measures to reduce or control direct impacts on public services, if any.

None.

16. Utilities

- a. Check utilities currently available at the site:

electricity natural gas water refuse service telephone sanitary sewer
 septic system other:

- b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

None.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Hollis Crapo

Name of signee Hollis Crapo

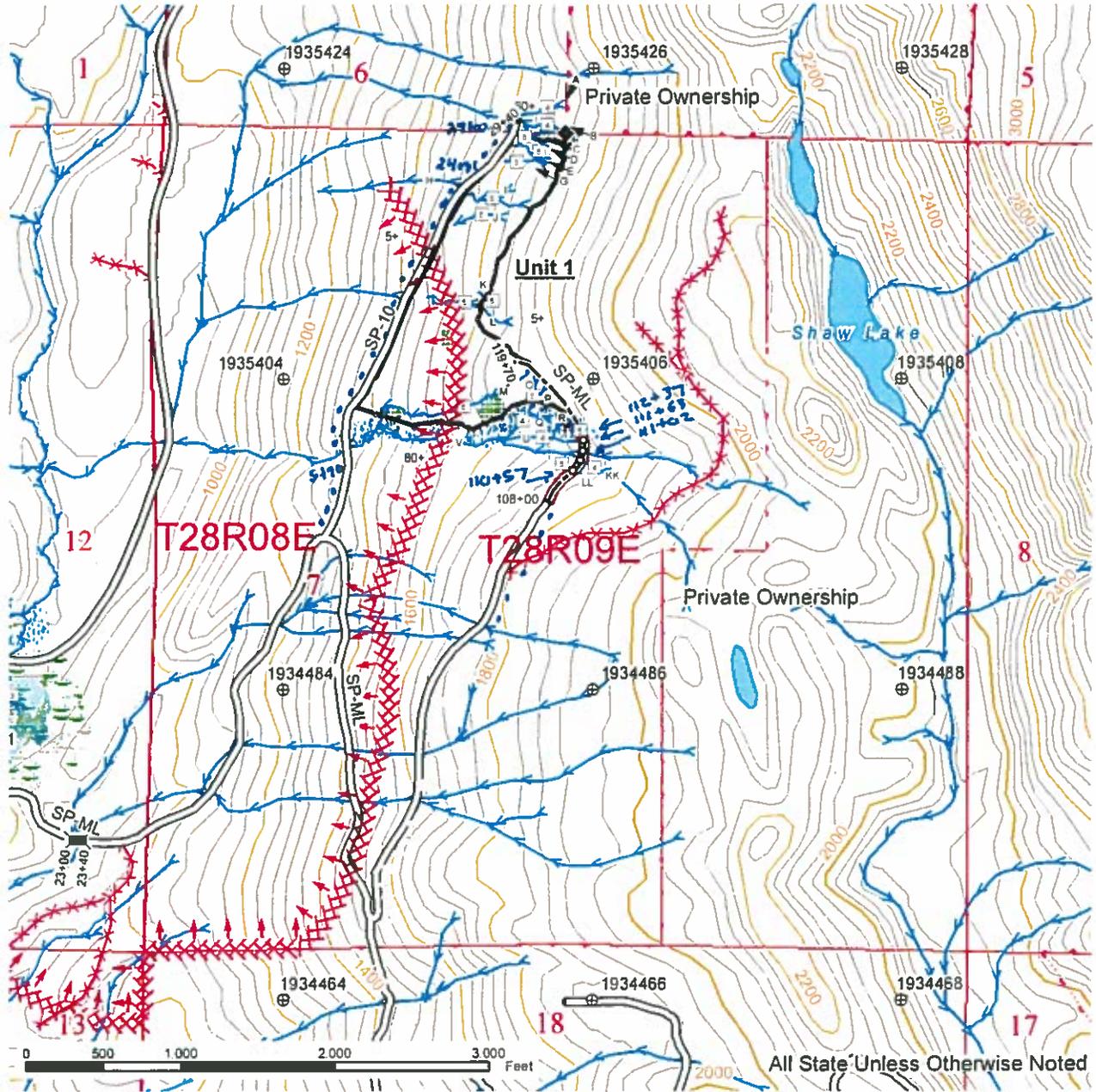
Position and Agency/Organization Pre-sales Forester DNR

Date Submitted: 10-26-16

FOREST PRACTICES ACTIVITY MAP

SALE NAME: LUGNUT
APPLICATION #: None

COUNTY(S): SNOHOMISH
TOWNSHIP(S): T28R08E
09E

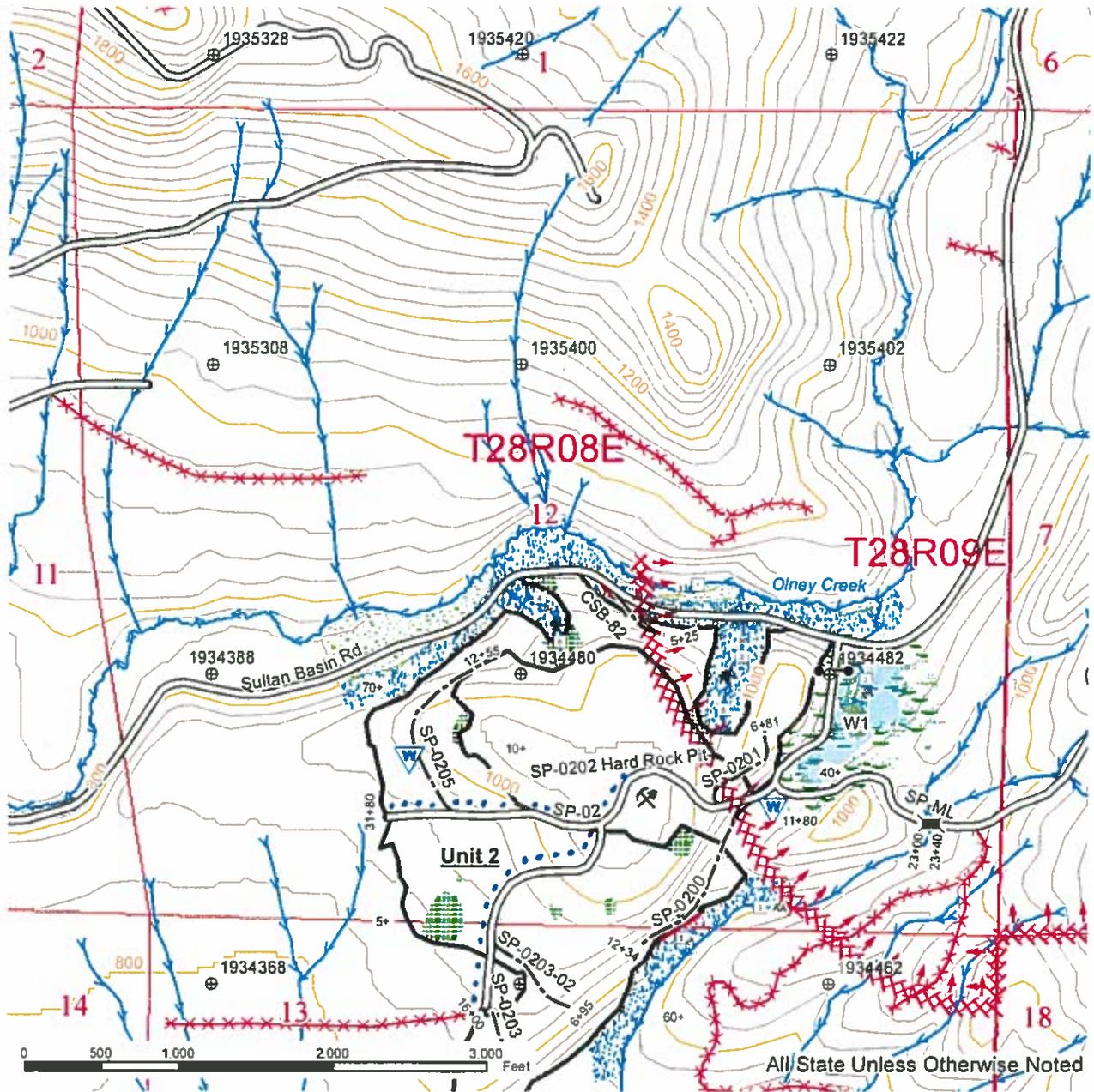


Timber Sale Unit	Existing Roads	Streams
Open Water	Temporary Construction	Stream Type
Right of Way	Existing Abandon/Orphan Road	Stream Type Break
Wetland Mgt Zone	Wildlife Timing Restriction	Culvert
Forested Wetland	Public Land Survey Sections	Bridge Installation
Riparian Mgt Zone	Public Land Survey Townships	Survey Corners
Leave Tree Area	DNR Managed Lands	Tics - 2000' Interval
Channel Migration Zone	A,B,C Stream Identifier	
	To be abandoned	

FOREST PRACTICES ACTIVITY MAP

SALE NAME: LUGNUT
APPLICATION #: None

COUNTY(S): SNOHOMISH
TOWNSHIP(S): T28R08E



Timber Sale Unit	Existing Roads	Streams
Right of Way	Temporary Construction	Stream Type
Wetland Mgt Zone	Existing Abandon/Orphan Road	Stream Type Break
Forested Wetland	Wildlife Timing Restriction	Waste Area
Riparian Mgt Zone	Public Land Survey Sections	Gate (F-1)
Leave Tree Area	Public Land Survey Townships	Bridge Installation
Channel Migration Zone	DNR Managed Lands	Existing Rock Pit
	A,B,C Stream Identifier	Tics - 2000' Interval

Prepared By: hcra490 07/18/2016

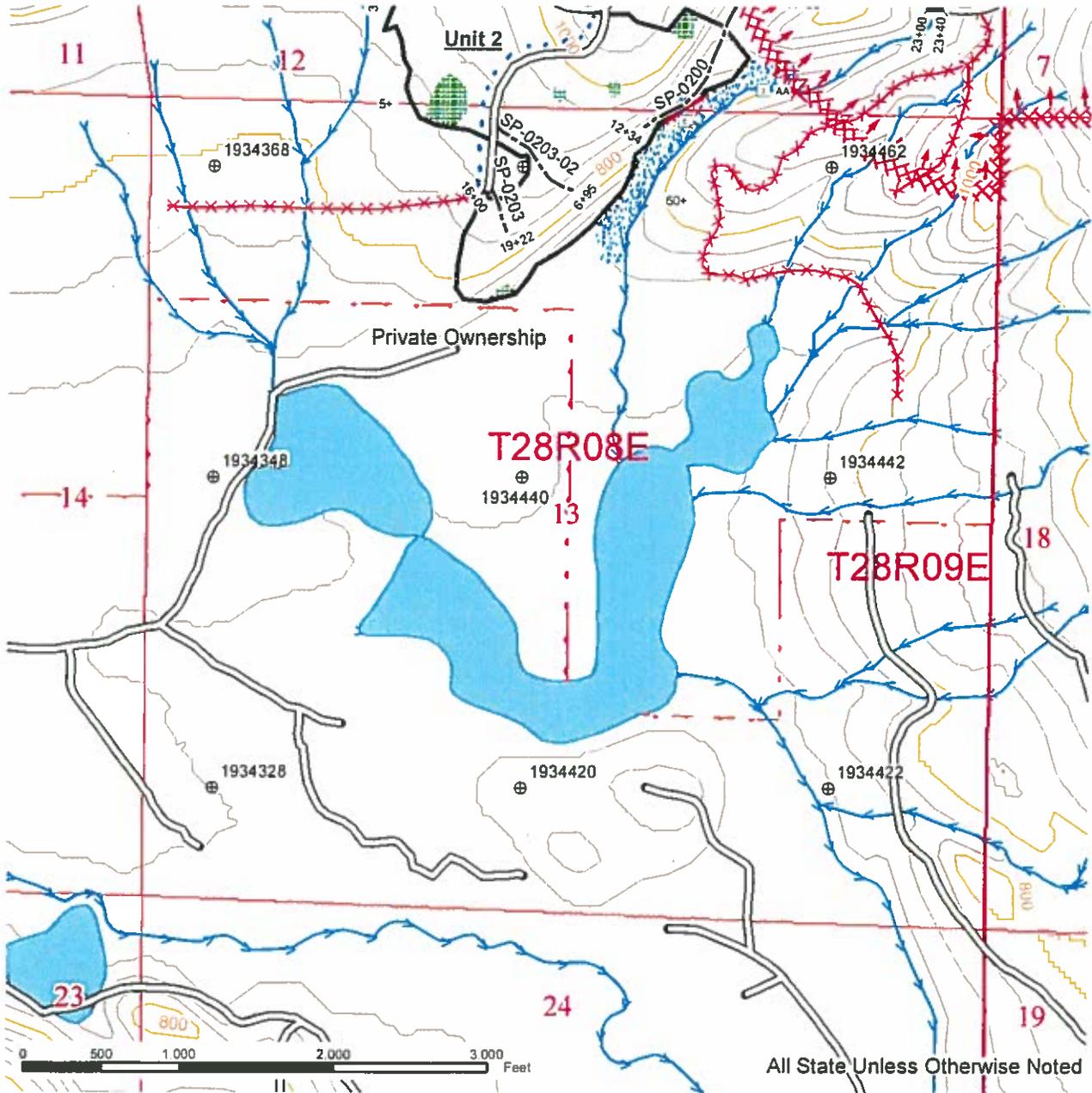
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Modification Date: 10/13/2016

FOREST PRACTICES ACTIVITY MAP

SALE NAME: LUGNUT
APPLICATION #: None

COUNTY(S): SNOHOMISH
TOWNSHIP(S): T28R08E



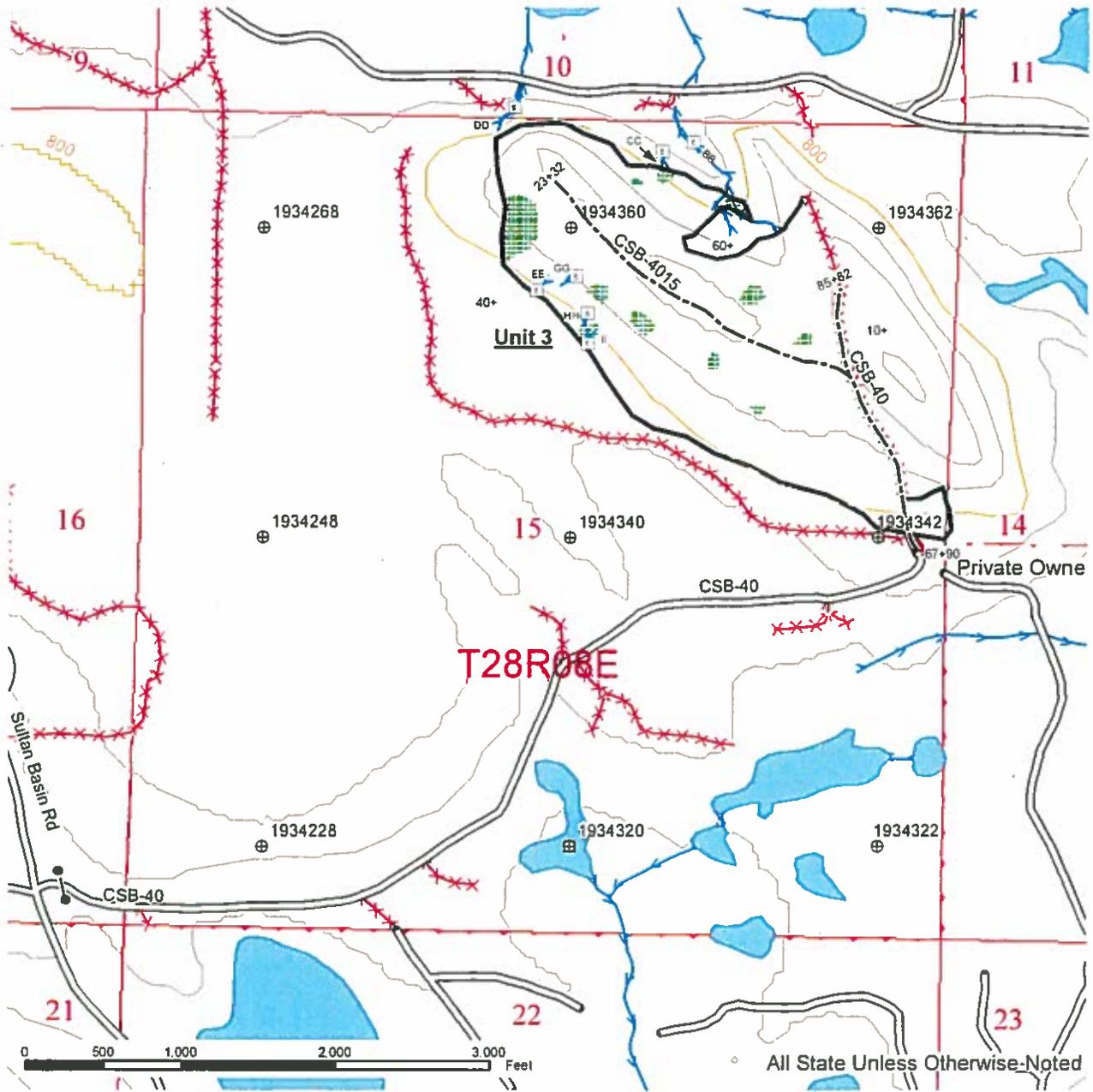
Timber Sale Unit	Existing Roads	Streams
Open Water	Temporary Construction	Stream Type
Right of Way	Existing Abandon/Orphan Road	Stream Type Break
Wetland Mgt Zone	Wildlife Timing Restriction	Waste Area
Forested Wetland	Public Land Survey Sections	Bridge Installation
Riparian Mgt Zone	Public Land Survey Townships	Tics - 2000' Interval
Leave Tree Area	DNR Managed Lands	
Channel Migration Zone	A,B,C Stream Identifier	



FOREST PRACTICES ACTIVITY MAP

SALE NAME: LUGNUT
APPLICATION #: None

COUNTY(S): SNOHOMISH
TOWNSHIP(S): T28R08E

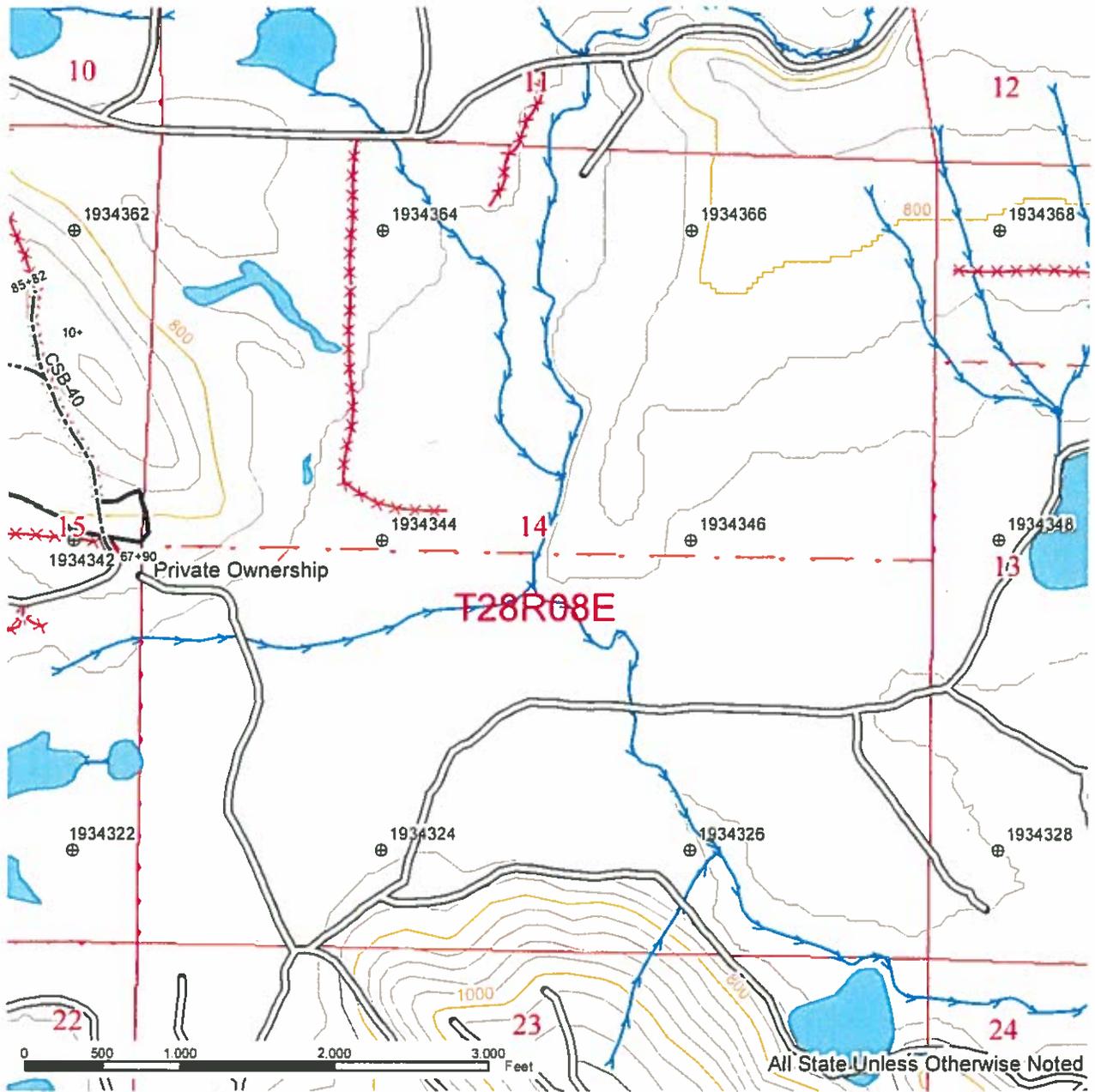


Timber Sale Unit	Existing Roads	Streams
Open Water	Temporary Construction	Stream Type
Right of Way	Existing Abandon/Orphan Road	Stream Type Break
Wetland Mgt Zone	Wildlife Timing Restriction	Gate (F-1)
Forested Wetland	Public Land Survey Sections	Tics - 2000' Interval
Riparian Mgt Zone	Public Land Survey Townships	
Leave Tree Area	DNR Managed Lands	
Channel Migration Zone	A,B,C Stream Identifier	

FOREST PRACTICES ACTIVITY MAP

SALE NAME: LUGNUT
APPLICATION #: None

COUNTY(S): SNOHOMISH
TOWNSHIP(S): T28R08E

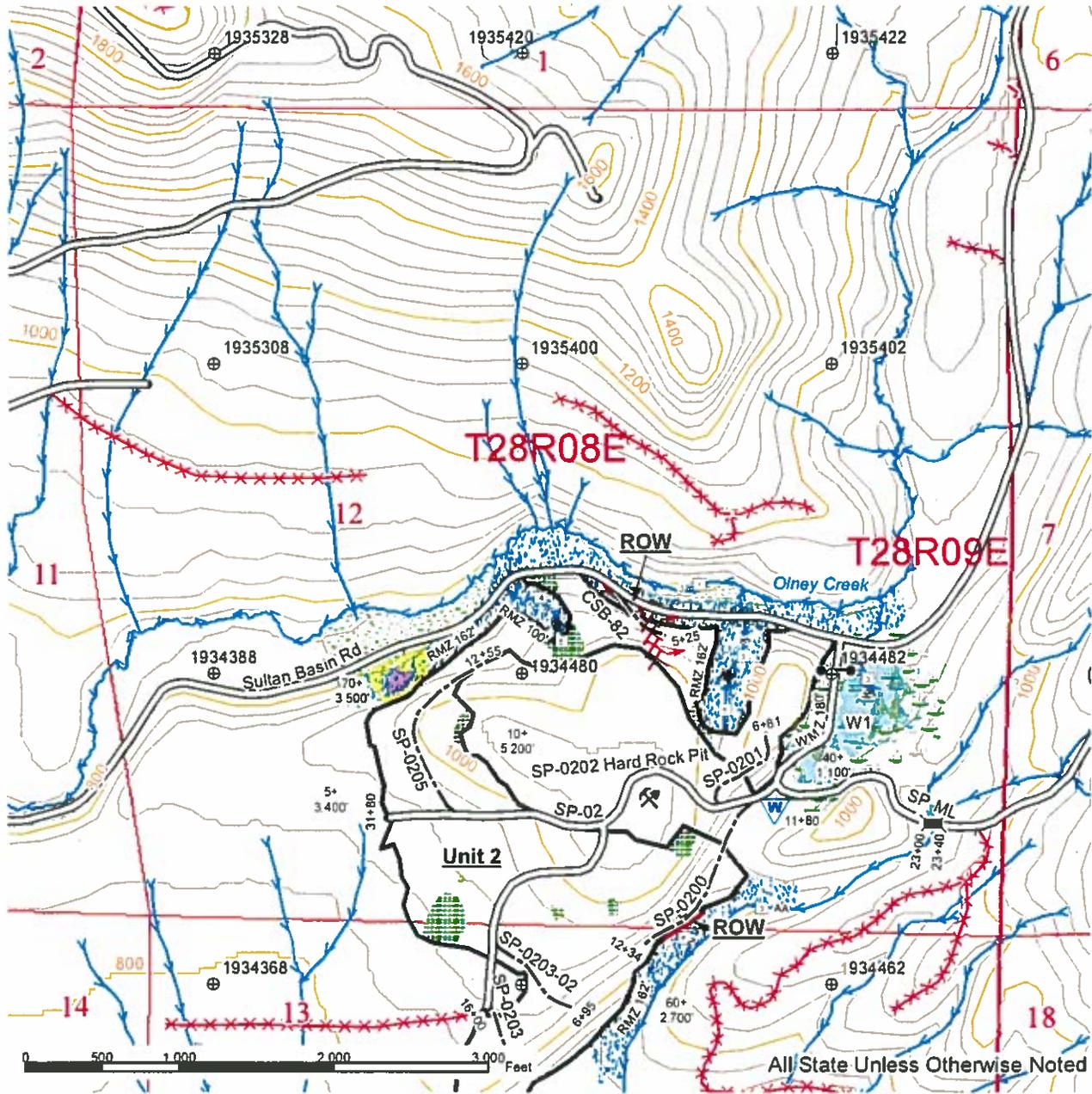


Timber Sale Unit	Existing Roads	Streams
Open Water	Temporary Construction	Stream Type
Right of Way	Existing Abandon/Orphan Road	Stream Type Break
Wetland Mgt Zone	Wildlife Timing Restriction	Tics - 2000' Interval
Forested Wetland	Public Land Survey Sections	
Riparian Mgt Zone	Public Land Survey Townships	
Leave Tree Area	DNR Managed Lands	
Channel Migration Zone	A,B,C Stream Identifier	

FOREST PRACTICES ACTIVITY MAP

SALE NAME: LUGNUT
APPLICATION #: None

COUNTY(S): SNOHOMISH
TOWNSHIP(S): T28R08E



Timber Sale Unit	Existing Roads	Streams
Right of Way	Temporary Construction	Stream Type Break
Wetland Mgt Zone	Existing Abandon/Orphan Road	Waste Area
Forested Wetland	Wildlife Timing Restriction	Gate (F-1)
Riparian Mgt Zone	Public Land Survey Sections	Bridge Installation
Leave Tree Area	Public Land Survey Townships	Existing Rock Pit
Channel Migration Zone	DNR Managed Lands	Tics - 2000' Interval
Potentially Unstable Features	A,B,C Stream Identifier	
Area Reviewed by Geologist		

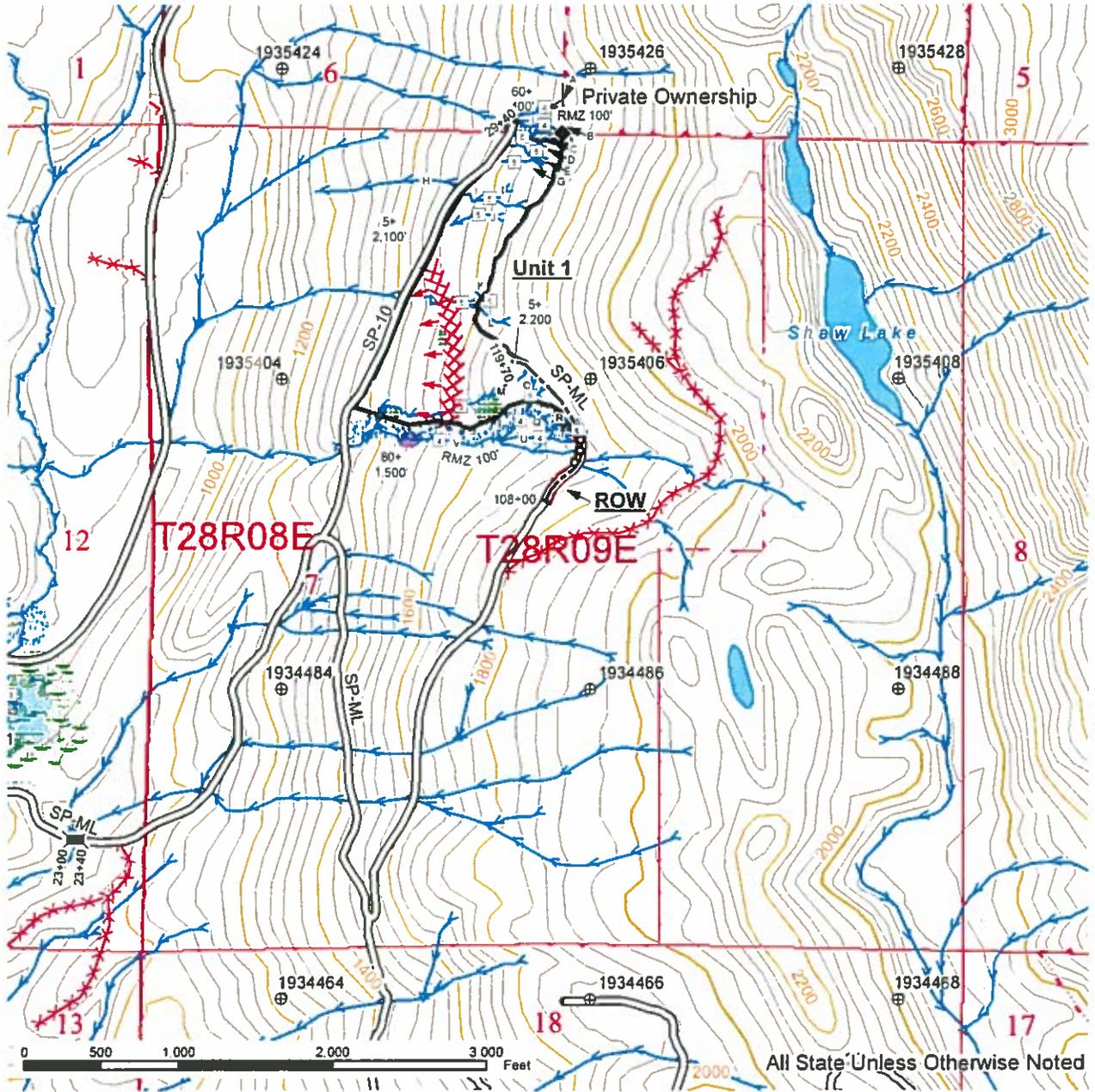
Prepared By: hcra490 07/18/2016

Modification Date: 8/18/2016

FOREST PRACTICES ACTIVITY MAP

SALE NAME: LUGNUT
APPLICATION #: None

COUNTY(S): SNOHOMISH
TOWNSHIP(S): T28R08E



Timber Sale Unit	Existing Roads	Streams
Open Water	Temporary Construction	Stream Type
Right of Way	Existing Abandon/Orphan Road	Stream Type Break
Wetland Mgt Zone	Wildlife Timing Restriction	Culvert
Forested Wetland	Public Land Survey Sections	Bridge Installation
Riparian Mgt Zone	Public Land Survey Townships	Survey Corners
Leave Tree Area	DNR Managed Lands	Tics - 2000' Interval
Channel Migration Zone	A, B, C Stream Identifier	



ICN No. 135503	Legal Subdivision NW 1/4	Section 13	TWP 28N	RGE E/W 6E	Application / Notification #	Class
Landowner WADNR NW Region - Hollis Crapo		Timber Owner same as landowner		Operator same as landowner		
Mailing Address 919 N Township Street		Mailing Address		Mailing Address		
City, State /Province), Zip /Postal Code) Sedro-Woolley, WA 98284		City, State /Province), Zip /Postal Code		City, State /Province), Zip /Postal Code)		
Meeting Location On site		Telephone Conference <input type="checkbox"/>	Date 6/2/2016	Time 1100	Region NW	
Subjects Discussed:						
<p>Landowner representative requested a pre-application review of the proposed 3 unit "Lugnut" timber sale. Units 2 and 3 will be ground based and unit 1 will be a combination of ground based and cable. An existing log stringer bridge on the Studebaker Mainline (unit 2) is planned to be replaced as a part of this planned timber sale.</p> <p>Unit 1 has steeper slopes and is approximately 25 acres with approximately 1000' of road construction. It is adjacent to a younger plantation. Unit 2 is generally flat and is approximately 80 acres with approximately 4,000' of road construction. There is an inner gorge feature to the NW of the proposed unit. Unit 3 is approximately 75 acres with approximately 4,000' of road construction.</p> <p>An IDT meeting was held on 6/2/16 to discuss the bridge removal and install. The group looked at the stream and the proposed bridge plan for removal and install options. A concurrence will not be required for the bridge plans as the stream is confined. A FPHP will be required for the proposal.</p> <p>An IDT was held on July 27 (I was not able to attend) to determine stream type break for a stream adjacent to unit 2 of the planned sale. It was agreed that the stream the group looked at is not a type F stream. Concurrence info will be submitted with the FPA.</p> <p>Field review of the planned harvest units was done on August 24. Looked at the bounded out inner gorge feature in unit 2. Feature is correctly bounded out of the harvest unit. Unit 1 has steeper slopes and may use self leveling ground based equipment on ground up to 50%. Anything over 50% will be cable yarded.</p>						
Decisions Made:						
<p>There were no specific resource concerns observed within the proposed harvest units during the site visit. Required buffers were spot checked and appear to be correctly marked on the ground. Unstable features were bounded well outside of the harvest boundaries.</p>						
PRINT Participants' Names		*SIGNATURES of Participants		Representing		Copies Mailed
Hollis Crapo John Moon Amy Halgren Derek Marks Neil Shea Jamie Bails		<i>Steven Huang by R. Utz</i>		landowner landowner landowner Tulalip Tribes Tulalip Tribes DFW		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Position No. 2925	Signature & Title of DNR Representative Steven Huang Forest Practice Forester			Date 9/6/16	Work Phone (360)856-3500	
<p>* (Participant signature means Note is correct for subjects discussed and decisions made at the meeting.) Did not attend -- mail copies to: FPARM, FPDM, FPCOORD, SKY30, USFS <input type="checkbox"/> Timber Owner <input checked="" type="checkbox"/> Landowner <input checked="" type="checkbox"/> Others: SNOCO, ECY, DFW, DOR, TULALIP</p>						

MEMORANDUM

August 19, 2016

TO: Hollis Crapo, Amy Halgren, NW Region

FROM: Sabra Hull, Forest Resources Division

SUBJECT: Wetland areas on Lugnut timber sale

Unit 2, NE ¼ of SE ¼ Sec. 12 T28 R8E

This is to follow up on discussions we had during a field visit to Lugnut timber sale on June 9th, 2016.

Hollis and I visited an incised creek S of Sultan basin Rd, in Unit 2 of the timber sale. The creek branches into two channels, and is adjacent to a large wetland complex. Topography is flat, and while there are mapped hydric soils nearby, they barely lap over the southern edge of the unit.

The wetland complex has an overstory of hemlock, Sitka spruce, and western redcedar. All species are very shallowly rooted, resulting in an immense amount of blowdown, and navigating on foot requires walking on large-diameter, jack-strawed trees. The wetlands were flooded or saturated, and supported an assortment of wetland obligate and facultative wetland vegetation. Upland areas between wetlands are dominated by salal, red huckleberry, fools huckleberry, and Alaska huckleberry, which obscure the overall view. Previous forest was enormous western redcedar; stumps have springboard notches.

Hollis had already determined that it would be too difficult operationally to harvest within or adjacent to the wetland complex, and I concur. There are no plans to manage this wetland complex.

Cliff area west of SP-020

We continued to Road SP-020, where a type 3 stream/wetland complex parallels the road on the west side. Adjacent to the west side of the road is a cliff face which parallels and rises above the road. The RMZ on the western side of the type 3 stream will include the road and cliff, and therefore will not contribute to riparian function as intended by the RFRS. Hollis wonders if the wind-prone top of the cliff could be harvested. This would likely require variances from the Riparian and Cliff procedures, and requires further Region and Division review.

Unit 1 SE ¼ Sec 7, T28R9E

The region wishes to re-open an abandoned road (SP-ML) in order to harvest the unit west of the road. At the northern terminus of the road is a wetland of about a tenth of an acre in size. This area is receiving water from the cut-bank on the east side of the road. The soils here are hydric, loose, and fully saturated on the day of our visit. It appears the cut-bank may have slumped or simply eroded, and has deposited the loose soil on top of the roadbed. The resulting wet substrate now supports obligate and facultative wetland vegetation, and a bit of habitat that may be somewhat rare on this otherwise well-drained slope, with its rocky soils.

The approach we discussed for achieving the department's no net loss policy are detailed on page two.

Mitigation approach for road management activities impacting the small wetland on SP-ML:

- Dry-season construction and abandonment
- Place geotextile and rock on wetland area
- Funnel water from the cut-bank via a ditch through a culvert

Then, during abandonment:

- Remove rock and geotextile
- Remove culvert
- Re-contour road surface to match current shape (including filling of ditch)
- Revegetate using root-wads and wetland seed-mix

Please let me know if there are any questions, or if I can clarify in any way.

July 1, 2016

TO: Hollis Crapo, Forester

FROM: Lisa Egtvedt, Wildlife Biologist

SUBJECT: Site Review of a Cliff in Association with the Proposed Lugnut Timber Sale

This memo serves as documentation of a region biologist review of a cliff that is located immediately adjacent to the proposed Lugnut Timber Sale, Unit 2. On June 30, 2016, I visited this site with Hollis Crapo & Pete Hurd in order to assess it in relation to a proposal to vary the width of a wetland buffer at this location.

Although this feature is comprised of a vertical rock face that is more than 25 feet tall (therefore is considered a "cliff" under the HCP definition), it does not contain any special habitat features such as ledges, overhangs, fissures, caves, or talus. It is basically a sheer vertical rock face, with some small "benchy" areas that support individual mature conifer trees and shrubs, with a dense shrub cover at the base (see Figures 1 & 2 below for a representation of the cliff). There is a stand of mature conifer trees at the top of the cliff, which is currently proposed as part of Lugnut Unit 2. It should also be noted that this feature is located right next to an active logging road.

A standard wetland buffer width at the location of the cliff would result in only a narrow line of trees retained at the top edge of the cliff (not to mention a gap in the buffer due to the location of the existing road). When the rest of the stand is harvested, this could likely result in the blowdown of these trees. Due to this windthrow potential, I would not recommend retaining such a narrow line of trees, particularly as I did not observe any evidence that it is *or might be* used by raptors for nesting or perching, which would be the primary reason for retaining trees at the top of a cliff.

I was informed of the area where the buffer is proposed to be expanded (to mitigate the narrower buffer at the cliff location), and though I did not evaluate that area in relation to this specific proposal, I did see it while conducting marbled murrelet habitat delineation verification. The stand in that area has a much higher likelihood of remaining standing, so I support the proposal to widen the buffer at that location.

Thank you for the opportunity to review and provide input for this proposal.

Figure 1. Photo taken of the cliff adjacent to proposed Lugnut Unit 2



Figure 2. Another angle of the cliff adjacent to proposed Lugnut Unit 2





TO: Hollis Crapo, Forester
Boulder Unit, Cascade District
Northwest Region

FROM: John McKenzie
Licensed Engineering Geologist
Forest Resources Division
Northwest Region

Gregory Morrow
Geologist-in-Training
Forest Resources Division
Northwest Region

SUBJECT: **MEMORANDUM**
Discussion of Landslides and Slope Stability around Unit 2
Lug Nut Timber Sale

DATE: September 2, 2016

This memorandum briefly discusses two landslides associated with Unit 2 of the Lug Nut Timber Sale (Sale). The Sale is located in Sections 12, 13, 14, and 15, T28N, R08E, and Section 7, T28N, R09E about six miles northeast of the town of Sultan. The area of interest for this memorandum is located in Section 12, T28N, R08E. The discussions herein are based on review of various GIS layers (including the Forest Practices Landslide Inventory) in the DNR database, review of pertinent maps and the publications in my office files, review of pertinent orthophotographs and stereoscopic aerial photos on file at Northwest Region office, field reconnaissance and discussions with Mr. Crapo (Boulder pre-sales forester). Field reconnaissance was conducted on July 28, 2016.

PHYSICAL SETTING

The Sale is composed of three units that lie on the lowland hills of Sultan Basin, overlooking Marsh Creek and Olney Creek to the north. Elevations across the Sale range from about 680 feet to 1020 feet. The slopes in the Sale are characterized by generally gentle to moderately-steep rolling topography (Figure 2). Slopes of 70 percent or greater are confined to terrace slope faces and steep hillslope topography in and around the Sale. Locally, some areas of steep glacial terraces and associated steep slopes with short pitches of 70 percent or greater are scattered about the Sale. The Sale area is accessed by Studebaker Pass Mainline (SP-ML). Geology underlying the area of Unit 2 of the Lug Nut Timber Sale was published in 1993 by Tabor and others (*Geologic map of the Skykomish River 30- by 60-minute quadrangle, Puget Sound region, Washington: U.S. Geological Survey, Miscellaneous Investigations Map I-1963, 1993; scale 1:100,000*). Geologic mapping shows that the area of Unit 2 is underlain by recessional outwash deposits of the Vashon stade of the Fraser glaciation. These deposits range from well-sorted and stratified sands and gravels, to well-bedded silty-sands to silty-clays. Bedrock is mapped at the

deposits of the Vashon stade of the Fraser glaciation. These deposits range from well-sorted and stratified sands and gravels, to well-bedded silty-sands to silty-clays. Bedrock is mapped at the surface just north of the Unit 2 Sale boundary, and is mapped as Pre-Tertiary age argillite and greywacke of the western mélangé belt.

The terrace slope-face adjacent to the northwest corner of Unit 2 was identified to have two relatively modest-sized deep-seated landslides using LiDAR derived topography. Other portions of the Sale are located on hillside areas or adjacent to terrace slopes that are not affected by past landslide processes. These landslides are not catalogued in the Forest Practices Landslide Inventory database (FPLID). There are no other known landslides in or around the proposed Sale.

DISCUSSION OF LANDSLIDES ABOUT THE SALE

As noted earlier two landslides were identified adjacent to the Lug Nut Timber Sale. The westernmost landslide will be referred to as the West Landslide, and the easternmost landslide will be referred to as the East Landslide. The morphology of the West and East Landslides are very similar, suggesting a similar style of failure and mechanics. Both landslides have a low slope position. The West and East Landslides are adjacent to the northwest corner of Unit 2. The topography of the landslides suggests that they can be characterized as rotational translational, and are deep-seated landslides. Both of these landslides are discussed in more detail below.

The **West Landslide** is approximately 300 feet in width, and is approximately 200 feet in length, and is approximately 0.8 acres in area. The furthest extent of the slide is approximately 80 feet from Sultan Basin Road, and is approximately 300 feet from Olney Creek. The terrace slope the slide propagated from is approximately 100 feet in height. The slide is estimated to be greater than 10 feet in thickness, and can be characterized as dormant indistinct (*Forest Practices unstable slopes board manual*) or dormant mature (*Cruden and Varnes, 1996 in Turner, K.A. and Schuster, R.L. eds., Landslides Investigation and Mitigation: Transportation Research Board, National Research Council, Special Report 247; National Academy Press, Washington, D.C.*). The Sale boundary does not intrude on to the scarp or body of the landslide. Sale boundary tags were observed in the field to be placed above the break-in-slope of the landslide scarp. (However, it should be noted that due to possible GPS error, the Sale boundary polygon appears in the SUMA data to intrude upon the scarp of the West Landslide – this is not representative of the observed field conditions). In effect no management activities are proposed on the body of the West Landslide.

The **East Landslide** is approximately 150 feet in width, and is approximately 120 feet in length, and is approximately 0.2 acres in area. The furthest extent of the slide is approximately 90 feet

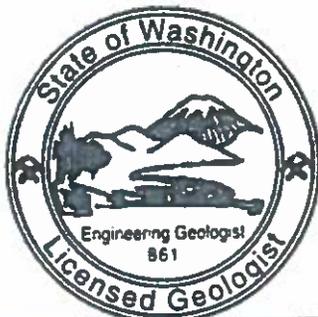
than 10 feet in thickness, and can be characterized as dormant indistinct (*Forest Practices unstable slopes board manual*) or dormant mature (*Cruden and Varnes, 1996 in Turner, K.A. and Schuster, R.L. eds., Landslides Investigation and Mitigation: Transportation Research Board, National Research Council, Special Report 247; National Academy Press, Washington, D.C.*). The scarp and body of the East Landslide are excluded from the Sale. In effect no management activities are proposed on the body of the East Landslide.

The West and East Landslides were reviewed in the field and reconnaissance did not show evidence of current, recent, or historic movement. Ground cracks on the bodies of the slides were not observed, and the stumps from earlier entries and the standing conifers do not appear to be disturbed. Review of aerial photographs did not suggest these landslides is active. It appears the timber in the vicinity of Unit 2 on these landslides was clear-cut prior to 1954 without an apparent adverse impact. Currently, no management activities are proposed on the landslide bodies. Based on the response of the East and West Landslides to the prior harvest history, it is not anticipated that the proposed harvest will have an adverse impact on the stability of the landslides. Therefore, based on our review and field reconnaissance, the potential for the Sale to adversely impact the two deep-seated landslides – West Landslide and East Landslide – is judged to be low.

If you have any questions, please do not hesitate to call.

John M. McKenzie
Northwest Region Engineering Geologist
LEG 861

Greg E. Morrow
State Lands Geologist
GIT



John M. McKenzie
9/2/16