

**Project #1 - Small Tree-Topping**

**Project #2 - Down Wood Creation**

**End Result:** Improve stand structure and species diversity in even-aged monoculture plantations of Douglas-fir. The end result will create old growth habitat for the marbeled murrelet and spotted owl, and other old growth dependent species.

**Measure of accomplishment:** Trees topped and trees felled

**Quantity:** 1182 for Project #1, 394 for Project #2

**Project Specifications**

Subdivision Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Subdivision Acres	4	13	28	19	42	41	22	14	41	45	42	54	32	9
Project #1 - number of trees to top	9	36	81	54	120	123	66	42	123	129	126	150	93	30
Project #2- number of trees to fall	3	12	27	18	40	41	22	14	41	43	42	50	31	10

- 1) Trees selected for treatment will consist only of plantation trees, and will be distributed following the criteria described below in the identified subdivisions.
- 2) All trees selected will be live Douglas-fir or hemlock trees. Hemlock will not be cut where this species is less than 50% of the specific treatment area. Trees selected will be sound: shall not have forked or broken tops, crooked boles, large scars, or other detrimental structural characteristics.
- 3) **Distribution shall be clumped or grouped. Groups and clumps shall be at least 100' from a stream or open road and at least 75' uphill and 50' downhill from any other road.**
  - a) Mingle topped trees and down wood (Tree Falling) in large clumps, but combined opening size should not exceed ½ acre; for example 120' wide and 200' long.
  - b) Clump is defined as an area containing 10 or more treated trees that are within 50' of another treated tree of the same clump. Clumped trees should be a combination of felled or topped trees. Total affected area when mingling treatments shall not exceed ½ acre; Minimum size of a clump should be 10 treated trees; such as 5 felled and 5 topped. Distance between clumps with more than 10 treated trees shall be 400-800 feet.
  - c) Group is defined as 2 to 9 treated trees that are within 50' of another treated tree of the same group. Distance between groups shall be 200-400 feet.
  - d) Location of treatment areas should be along secondary ridges and gentler slopes where possible. Locate clumps first around any big leaf maple trees - if present, second around large alder (> 8" dbh) - if present, and third around one or two "dominant" live conifer trees.

**Chainsaw topping:** intent is to create snags and live topped trees in equal proportion, but a ten percent tolerance is acceptable; e.g., 40% snags and 60% live topped or vice versa. Handsaws are permitted during nesting and fire restricted seasons. (Other methods of tree topping are not permitted, such as blasting tops out.)

- 4) **Chainsaw topping: Snag trees.** Intent is to create a dead tree/snag.
  - a) **Snag trees will have two to four live limbs over five feet in length and will be at least 35' tall.**
  - b) Remove epicormic branches, limbs shorter than 5 feet and any other live limbs below treatment, except for the 2-4 required.

- c) The sawed surface will have 4 grooves, each at least 4 inches deep. Grooves will be created in a tic-tac-toe grid formation.
- 5) **Chainsaw topping: Live trees.** The intent is to promote development of a stove-pipe cavity in a live tree. Topping to the specified standards will provide good conditions for fungi that cause heart-rot, and retaining adequate amount of live limbs below topping site should keep the tree alive and allow upper most limbs to grow vertically and eventually provide cover over the developing cavity.
- a) Live trees will be in the largest size class available.
  - b) Live trees shall retain at least 15 live limbs that are at least five feet in length. Retain all epicormic branches and shorter live limbs.
  - c) Live tree diameter (outside bark) at topping height shall be greater than 6 inches.
  - d) Live trees will have a minimum of 1-foot of bole area above the last whorl of green limbs. This will facilitate rot development above last live whorl of branches. The sawed surface will have 4 grooves, each at least 4 inches deep. Grooves will be created in a tic-tac-toe grid formation.
  - e) Trees meeting these specifications (a, b, c and d) for Live trees will be dominant trees with full crowns (30-50% crown ratio).
- 6) **Tree felling**
- a) At least 70% of felled trees shall be felled side-hill (within fifty degrees of horizontal). Over-lap felled trees where possible.
  - b) Minimum outside bark diameter at breast height (dbh) of felled trees will be 10".
- 7) **Marking treated trees**
- a) **Topping: Contractor will paint topped trees** with a band of orange paint at dbh level and orange tree number above dbh level and wrap orange and white striped flagging around the trees. "Wildlife Tree" signs will be placed at dbh. Nails shall not be completely nailed into the tree to allow for continued diameter growth on all live trees.
  - b) **Tree felling:** Contractor will establish an untreated tree as the clump identification tree by wrapping orange and white striped flagging around trees and painting two bands of orange paint around a tree and painting the clump or group number on the tree; e.g., C1 or G1.
- 8) **The Contractor will furnish** paint, flagging, aluminum nails. **Government will furnish** "Wildlife Tree" signs.
- 9) **Contractor will map** location of each clump/group with GPS. GPS location of individual trees is not required. Coordinates are NAD 83, UTMs. Contractor must provide an electronic and written file of coordinates to the CA. Electronic transfer can be accomplished by submitting a CD or by sending an email with the attached file. Acceptable electronic methods are listed below and shall include coordinates and corresponding name, number, and clump number for each clump. These methods are:
- a) A GDB file with locations of clumps from Mapsource or similar program.
  - b) An electronic spreadsheet containing X column and Y column coordinates, and a column identifying corresponding data.
- 10) Contractor will label a Reference Tree at each treated subdivision that is live and easily visible from a main, drivable road. Mark with a band of orange paint and "R" painted above the band. Two pieces of orange and white striped flagging shall be tied on a branch or around the bole and shall extend a minimum of two feet, with point of tie facing the road. The contractor shall record the project name, project area number, bearing and approximate distance to the treated tree closest to the road, and the treated tree number on the flagging with a permanent marker. If the reference tree is over 200 feet from the closest treated tree, flag the route to the tree with orange and white striped flagging.
- 11) The Contractor is REQUIRED to submit a weekly plan of work at least two days before implementing each weekly plan. This plan shall be submitted to the project Contract Administrator (CA).

The Contractor is REQUIRED to inform the project CA within 7 days of when a subdivision has been accomplished and provide a completed tree register form with signature and a map showing

accurate location of clumps or groups of treated trees and their corresponding tree-numbers. See attached example of completed map and tree register form.

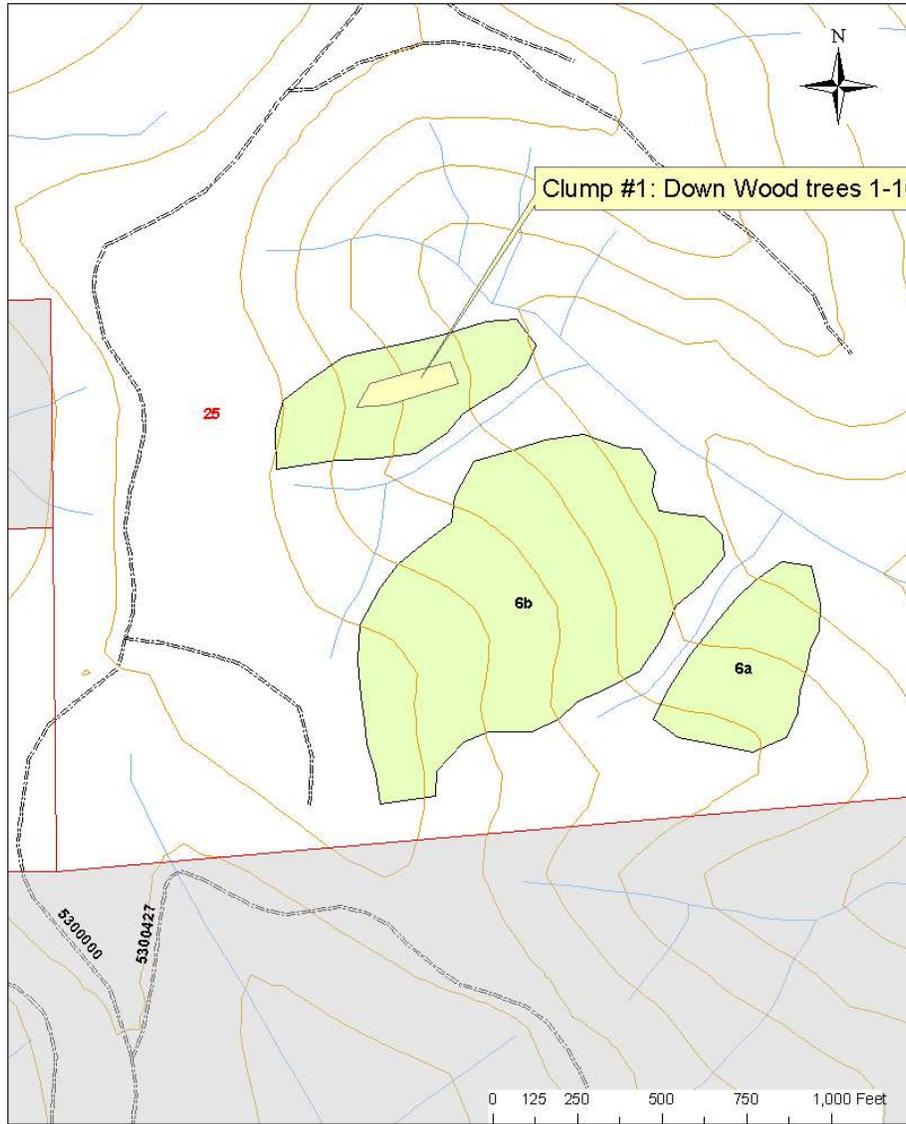
**When:** Work can occur anytime of year, with the following requirements:

- After yarding is completed and accepted for the subdivision.
- In wind-prone areas of harvested subdivisions (as identified by forest service), allow at least 1 year after harvest to complete the felling and topping.
- **For operating restrictions, use felling restrictions described in K-G.3.1.5# PROJECT OPERATION SCHEDULE**
- Power tool use shall be restricted between April 1 and September 15 to two hours after sunrise to two hours before sunset if within 100 yards of mature or old growth forest.

**Inspection details:** contractor will provide inspection reports as detailed in the Quality Control Plan.



### Earley School Unit Example Sale - Unit 6





**Project #3 - Scalp, Gap Plant, and Tree Protection, Upland Areas**  
**Project #4 - Scalp, Underplant, and Tree Protection, Upland Areas**

**End Result:** Increase species diversity in even-aged monoculture plantations by planting other tree species that typically make-up old growth habitat.

**Project # 3. Scalp, Gap Plant, and Tree Protection, Upland Areas -**

**Measure of Accomplishment:** Number of seedlings/trees planted and protected.

**Quantity:** 300 seedlings/trees. Plant and protect 300 seedlings on approximately 2 acres (averages approximately 150 seedlings/acre).

Table 1

<b>Subdivision Number</b>	<b>7</b>
Subdivision Acres	22
Project #3 - number of <b>1 acre</b> gaps created	2
Project #3 - number of seedlings to plant in created gaps	300

The creation of holes that average 1 acre in size is specified in the contract. The location of the gaps is shown on the Contract Area Map. The Contractor will adhere to the technical specifications below while planting the created holes with an average of 150 seedlings planted within each created 1 acre gap. This equates to an average spacing of 17' x 17'.

**Project # 4. Scalp, Underplant, and Tree Protection, Upland Areas -**

**Measure of Accomplishment:** Number of seedlings/trees underplanted and protected.

**Quantity:** 7350 seedlings/trees. Plant and protect 7350 seedlings on approximately 98 acres. (averages approximately 75 seedlings/acre).

Table 2

<b>Subdivision Numbers</b>	<b>4</b>	<b>5</b>	<b>9</b>	<b>13</b>	<b>Total</b>
Subdivision Acres	19	42	41	32	<b>134</b>
Project #4 - Planting Acres	14	30	31	23	<b>98</b>
Project #4 - number of seedlings to underplant in each thinning subdivision	1,050	2,250	2,325	1,725	<b>7,350</b>

It is expected that many small openings will be created following commercial thinning activities. It is in these small openings that underplanting activities will occur. **The Contractor should expect to cover the majority of the thinning subdivision acres (134 acres) to find 98 acres of acceptable planting spots as defined in the technical specifications presented below.**

**TECHNICAL SPECIFICATIONS FOR PROJECTS #3 & #4**

**SECTION 1 - GENERAL**

**1. DESCRIPTION OF PROJECT:**

The Contractor shall provide any and all labor, training, and equipment necessary to perform the mobilization, site preparation, tree planting, and tree protection as described in the

following sections. The Forest Service shall provide the tree seedlings, all tree protection devices, and self-inspection materials as specified in Section 3

## 2. ACCESSIBILITY:

Work areas may be reached by Forest roads that are accessible using a standard two-wheel drive pickup during normal operating seasons, unless otherwise indicated on Contract Area Maps. Vehicles shall not operate off system roads without prior written approval of the Contract Administrator (CA) or Contract Inspector (CI). Inaccessibility due to snow, fallen trees, slides or washouts on roads may or may not be permitted at the option of the Government. If road access is blocked, the Government may: (1) provide an alternate access route, or (2) substitute similar stewardship project. Roads shown on subdivision maps indicate access to subdivisions and are not to suggest the roads are open within the subdivisions or for any further travel. No vehicle shall by-pass any officially blocked road (barrier, locked gates, posted signs, rocks/log/dirt, etc.) without approval of the CA or CI.

## SECTION 2 - DEFINITIONS

Planting hole - An area that is at least **15 feet** from a live residual tree of any species. Planting holes will typically be found inside thinned subdivisions within skyline corridors approved by the CA or CI as designated corridors, below landing areas, and in Phellinus infection centers.

Hole - An opening in the subdivision canopy generally between 1/2 and 1 acre in size absent of, or sparsely stocked with conifers. The holes are either deliberately created within a thinned subdivision or created as a consequence of harvest operations.

Plantable Spot - An area from which vegetation, ash, duff, and debris has been or can be removed, and a tree seedling can be planted as specified elsewhere herein.

Unplantable Spot - An area within the specified spacing limits in which it is not possible to plant a seedling according to specifications.

Satisfactorily Planted Seedling - A seedling planted in full accordance with all planting specifications set forth in this contract.

Unsatisfactorily Planted Seedling - A planted seedling which fails to meet one or more of the specifications for a CA or CI as designated satisfactorily planted seedling.

Wasted Seedlings - Seedlings which are lost, damaged, destroyed, or handled contrary to the specifications for care of seedlings. Planted seedlings in excess of the maximum number of seedlings creditable as specified elsewhere herein are also considered to be wasted seedlings.

Cotyledon Scar - Lowest point on stem from which branches will grow. Marked by a distinct ring in the bark on most species of tree seedlings.

Root Length - Root length will be measured from the longest root tip and the cotyledon scar.

Replanting - Any planting work done in a stewardship project, either voluntarily by the Contractor or as directed by the CA or CI as designated, after the Contractor has given the planting inspection cards to the Government.

Mineral Soil - Where soil content is less than 70 percent coarse rock fragments greater than 2mm in size.

Microsite Planting - The planting of tree seedlings in plantable spots most favorable to seedling survival and growth. Examples of favorable microsite features that provide protection from sun, wind, animals, and other damaging agents are logs, and stumps.

Prepared Sites - An area from which logging slash and competing vegetation has been removed to allow a seedling to be planted in full accordance with all specifications set forth in this contract.

Scalp - The removal of all vegetation which exposes at least 70% mineral soil.

Tree Height - Tree height will be measured from the ground to the tip of the seedling.

Suitable Tree - A tree of good form and vigor which shows no physical damage and which conforms to the size, characteristics, and species specified on the Planting Data Sheets.

**SECTION 3 - GOVERNMENT FURNISHED PROPERTY**

GOV'T FURNISHED DATA PROPERTY AND SERVICES	QUANTITY	WHERE, WHEN AND HOW TO BE FURNISHED TO CONTRACTOR
1-0, 1-1 and 2-0 Seedlings	Project 3 & 4- 7650	Brought to site by Government
Tree Tubes and Bamboo	Project 3 & 4 - 7650 tubes and 15300 bamboo stakes.	Brought to site by Government.
Inspection Book Planting Inspection Sheet, R6-2470-113 Animal or Shade Inspection Sheet, R6-FS-2400-114 High Tide Thin STWD Mandatory Stewardship Project Specs.	CA or CI as designated satisfactory to complete the project.  One Set	Furnished at Pre-work meeting  Furnished at Pre-work meeting
Contract Area Maps	One Set	Furnished at Pre-work meeting
Government Quality Assurance Plan	One Set	Furnished at Pre-work meeting

**SEEDLING HANDLING EQUIPMENT**

**A. PLANTING BAGS**

Planting bags shall be a light color, shall not retain heat, shall have a minimum depth of 15 inches and shall be free of defects or contaminants.

**B. CARE OF SEEDLINGS**

The Contractor shall adhere to the following specifications for care and protection of tree seedlings:

1. Seedlings shall be protected at all times from drying, heating, smothering, freezing, crushing, drowning, abrasion, rapid temperature fluctuations, or contact with injurious substances.
2. Seedlings stored in boxes, bags, or bundles shall not be exposed to direct sunlight. Punctured or torn bags or boxes shall be promptly resealed. Containers of seedlings shall be opened only in full shade. Bundles, bags, or boxes shall be separated to provide free air movement.
3. Seedlings shall not be removed from shipping containers until needed for preparation for planting.
4. Seedlings shall be planted without further root or top pruning or culling. If pruning or culling is necessary, or if mold, dry roots, evidence of injury, or drying is seen, the condition shall immediately be reported to the CA or INS as designated.
5. Frozen seedlings shall not be handled until completely thawed. They shall be thawed in full shade.
6. Seedlings removed from cold storage facilities shall not be allowed to stand or lay in water or snow or be covered with snow.

7. Seedlings in planting bags shall have only their tops exposed. Burlap-wrapped trees shall have the wrappings loosened slightly.
8. Seedlings shall not be removed from a planting bag until immediately before planting in a prepared planting hole.
9. Seedlings shall be gently removed, one at a time, to prevent stripping or other injury, and quickly and gently inserted into the planting hole.
10. Seedlings carried in planting bags shall not exceed the amount that can be carried or removed without injury, or which can be planted before critical heating or drying occur. Seedlings placed in planting bags shall be planted out and not returned to storage. Trees in planting bags shall be planted out before extended breaks, such as lunch.
11. The Contractor shall not touch the roots of the seedlings.
12. The Contractor shall not dig and replant seedlings other than those located on inspection plots or spot checks of below ground planting quality.
13. Unplanted seedlings shall be returned to the Government at the end of each working day.

#### C. PLANTING WEATHER GUIDELINES

The Contractor shall plant only under the following weather conditions (see attached Weather Guidelines for Lifting and Planting):

1. Air Temperature between 30-65 degrees F
2. Wind Velocity less than 20 mph
3. Relative Humidity greater than or equal to 20%
4. Wet bulb depression (Dry bulb reading minus wet bulb) less than 8 degrees Fahrenheit

#### D. PREPARATION OF SEEDLINGS

The Contractor shall provide water and a container at least 15 inches wide and 15 inches deep for dipping roots of bareroot seedlings. Water and container shall be kept free of contaminants and used only for dipping. Roots shall be dipped in water to wet them prior to placing seedlings in planting bags. Seedlings shall remain in the water for at least 3 seconds but not longer than 30 seconds.

#### E. SPACING AND SPOT SELECTION

##### A. Seedlings Spacing Requirements:

1. Seedlings are to be planted only in planting holes. A planting hole is defined as any opening where a seedling can be planted at least 15 feet or more away from a residual tree of any species.
2. Seedlings shall be planted to the boundary of all planting areas and around the perimeter of unplantable areas in spots distributed at intervals prescribed. For individual seedlings, the specified average spacing may be varied no more than 25 percent in any direction to find a suitable planting spot. The specified underplanting spacing shall be 17' X 17' for Project 3 and 24' x 24' for Project 4 unless favorable conditions exist where Microsite planting would be most favorable.
3. Where microsite planting sites are available as many as four seedlings can be "clump" planted at 8 foot spacing. In no case shall a planted seedling be closer than 15 feet to a residual tree.

4. Prepared sites shall extend to the boundary of all planting areas and around the perimeter of all unplanted areas.

B. Planting Spot Selection:

1. Brush patches containing planting spots shall be planted even though this may require spreading stems aside or working around the stems.
2. Whenever possible, within the 25 percent variance in average spacing, planting spots shall be prepared where stumps, logs, dead brush, and terrain features provide partial protection from the sun, wind, animals, loose debris, and other agents detrimental to seedlings.

C. Microsite Planting:

1. Only western red cedar and western Hemlock shall be planted in the microsite locations. Microsites are the shade side of stumps, logs, brush and where designated by the CA or CI as Designated. At each microsite location up to 3 to 4 seedlings can be planted a minimum of 8 feet apart depending on the size of the microsite.
2. Seedlings shall be spaced a minimum of 15 feet away from existing healthy residual trees.

F. PLANTING SPOT PREPARATION

Prior to digging the planting hole, the Contractor shall clear or "scalp" the planting spot of all limbs, logs, snow, bark, rotten wood, rocks and other loose debris and shall scalp ash, duff, sod, crowns of living plants, and roots to moist mineral soil. The scalp shall be a minimum of 24" x 24". Site preparation and scalping dimensions are further described in Section 4. If slash prohibits the specific diameter of scalp, a smaller scalp will be acceptable.

G. PREPARING THE PLANTING HOLE

A. Planting holes shall be located near the center of the prepared planting spot and shall be between perpendicular to the ground surface and true vertical.

B. For Handtools: An open planting hole, broken out as shown the attached Exhibit 1, and deep and wide enough to fully accommodate the roots of the seedlings to be planted is required when hand planting tools are used. The planting hole shall be broken out on four sides, with the back of the planting hole being broken out after the seedling is suspended in the center of the planting hole.

H. SEEDLING PLACEMENT

The 1-0 and 2-0 Bare Root Seedlings - The bareroot seedling shall be suspended near the center of the planting hole with roots in a near natural arrangement at a depth such that, after filling, firming, and leveling, the soil comes to a point at or above the cotyledon scar of the tree. No portion of the roots shall be exposed. Roots shall not be doubled up, twisted, spiraled, or bunched. The root system shall be aligned with the axis of the planting hole with all roots extending downward. See Exhibit 1.

- It is permissible to cover the lowest whorl of branches with uncompacted soil.

I. FILLING AND FIRING

Moist mineral soil shall be filled in and firmed around seedling roots. Dry soil, ash, organic matter, rock and other foreign material shall be kept out of planting holes. Soil shall be filled in and firmed progressively so no loose soil or air pockets remain and the seedling is as firmly planted as soil conditions will allow. The Contractor shall not wedge the sides of the planting hole. Firming the soil around the roots shall be accomplished in a manner that assures the seedling and its root system is not damaged. After the soil is firmed around the roots, it shall be smoothed out to the

level of the surrounding mineral soil surface. After planting, the seedling stem shall be erect and free to grow. The seedling shall not be weighted down with mud or debris.

**J. MIXTURE OF PLANTING STOCK**

A mixture of planting stock will be used in each subdivision. The Contractor shall plant these mixtures or stages in locations as required by the CA or CI as designated.

**SECTION 4. PERFORMANCE WORK STATEMENT TASKS AND CRITICAL SUBTASKS**

The Contractor shall be responsible for all tasks concerning the handling, planting, and protection of the seedling. The Contractor shall perform the work to the Quality/Performance Requirements.

Planting

- Preparing seedlings for planting
- Spacing
- Planting spot preparation
- Scalping
- Seedling Placement

1. Plant in planting hole only. A planting hole is an area that is at least 15 feet from a live residual tree of any species.
2. For Projects 3 & 4 prepare a planting spot by creating 24 x 24 inch scalps. All vegetation will be removed from the scalps exposing mineral soil.
3. Government supplied seedlings will be a combination of 1-0, 1-1 or 2-0 Western Red Cedar, Sitka Spruce, Western Hemlock, Douglas-fir, Big Leaf Maple and Red Alder.
4. Trees will be dipped in water before planting with shovel or hodad. Contractor will provide water and buckets for dipping trees prior to planting.
5. Trees will be left in their shipping containers or planting bags until they are ready to plant.
6. Roots should only be exposed when dipping in water and when they are going into the ground.

Tree Protection

-Tubing

1. Tube all trees except spruce. Tubes and stakes are provided by the Government. Tubes will be supported by two 4 foot bamboo woven through the tubes 4 times (see exhibit 2).
2. The bamboo's large end will be in the ground at least 12 inches. The tree top will be vertical and not bunched in the tube. The bottom of the tube will be flush with the ground.
3. If a seedling is too large to tube, tubing will not be required.
4. The Contractor is required to haul all tubes and bamboo to the planting sites.

## Appendix C. Weather Guidelines for Lifting and Planting<sup>1</sup>

Weather guidelines for lifting and planting are based on both physical laws and certain assumptions. It is important to understand how these guidelines were generated and why certain conditions are less favorable than others. The discussion on weather guidelines in Chapter 8 should be read *before* using these tables. These tables are meant to be only general guidelines for safe lifting or planting; they are not hard and fast rules. The tables need to be tested and improved, based on experience and experimental data.

- Soil is not frozen more than one half inch deep.
- Snow cover is less than 2 inches.
- Air temperature is between about 0° and 18°C (32 and 65°F).
- Wind velocity is less than 20 miles per hour (disregarding occasional higher gusts).
- Tables C.1 and C.2 identify weather combinations favorable for lifting and planting.

Lifting and planting may proceed when:

- The upper 10 to 12 inches of soil are moist.

<sup>1</sup>Prepared by B. D. Cleary, Extension reforestation specialist, Oregon State University.

Table C.1. Weather guidelines for Lifting and Planting Douglas-fir. (Table gives maximum allowable wind velocity for a given air temperature-wet bulb depression combination.)

Air Temp. (°F.)	Wet bulb depression (°F) <sup>1</sup>																	
	1.0	2.0	3.0	4.0	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	> 11.0
30													18	18	16	14	12	
31													18	18	16	14	12	10
32												18	18	16	14	12	10	
33												18	18	16	14	12	10	
34												18	18	16	12	10	9	
35												18	16	16	12	10	9	
36												18	16	14	12	10	8	
37											18	18	16	14	12	10	8	
38											18	18	16	12	10	9	7	
39											18	18	16	12	10	9	7	
40											18	18	16	12	10	8	6	
41											18	16	14	12	10	8	5	
42										18	18	16	12	10	9	7	5	
43										18	18	16	12	10	8	6	4	
44										18	18	14	12	10	8	6	4	
45										18	16	14	10	9	7	5	4	
46										18	18	16	12	10	8	6	4	3
47										18	18	14	12	10	7	5	4	2
48										18	16	14	10	9	6	4	3	1
49										18	18	16	12	10	8	6	4	2
50										18	18	16	12	10	7	5	3	2
51										18	16	14	10	9	6	4	2	1
52										18	16	12	10	8	5	4	2	1
53										18	18	16	12	9	7	4	3	1
54										18	18	14	10	9	6	4	2	1
55										18	16	12	10	8	5	3	2	1
56										18	16	12	10	7	4	2	1	
57										18	18	14	12	9	6	4	2	
58										18	18	14	10	8	5	3	1	
59										18	16	12	10	7	4	2	1	
60										18	16	12	9	6	4	2	1	
61										18	14	10	8	5	3	1		
62										18	18	12	10	7	4	2	1	
63										18	16	12	9	6	4	1		
64										18	16	12	9	5	3	1		
65										18	14	10	7	4	2			

Plant—  
If wind velocity is less than 20 MPH.

No planting regardless of wind velocity.

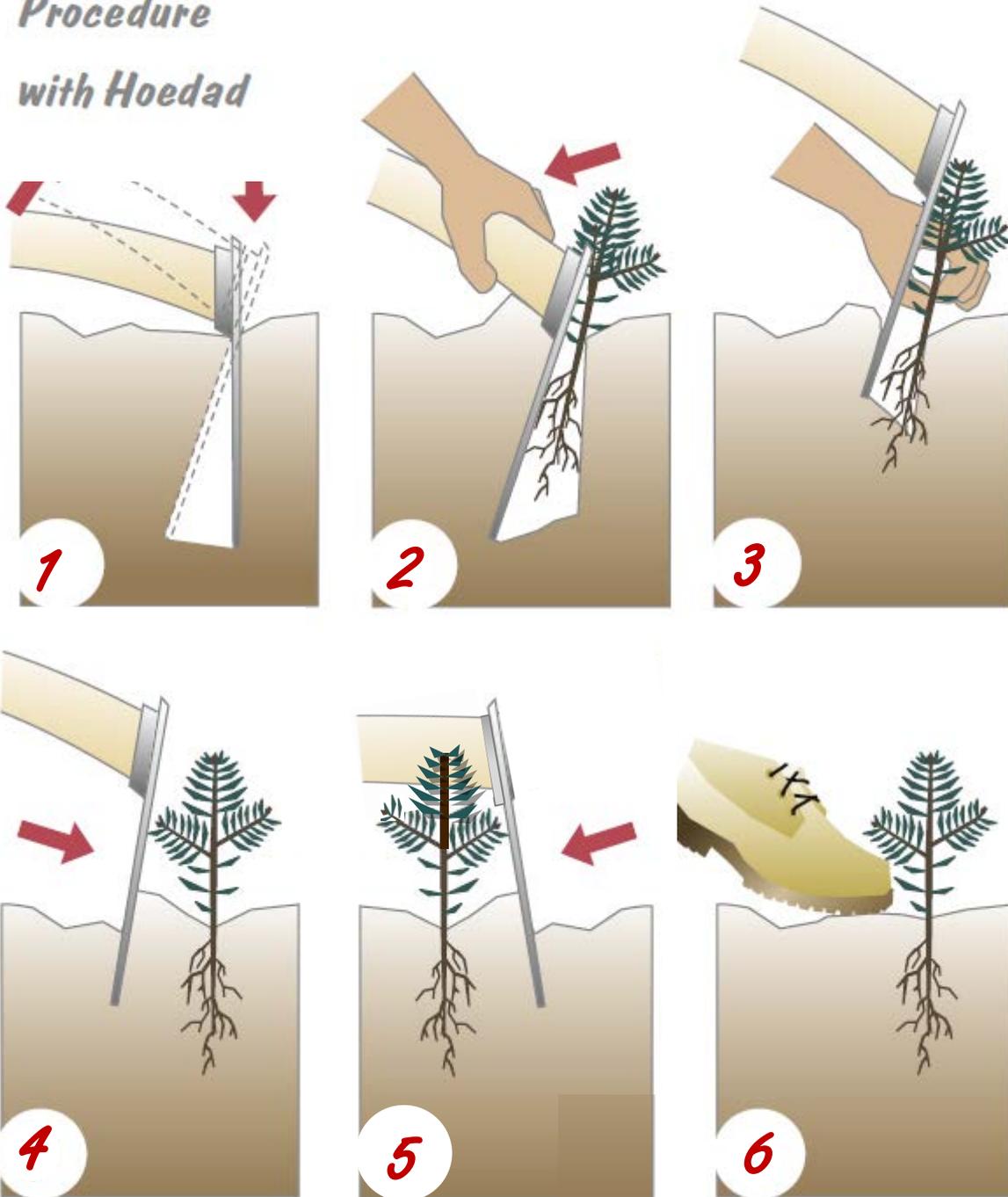
Plant	Conditional zone <sup>2</sup>	Do not plant
-------	-------------------------------	--------------

<sup>1</sup>Dry bulb temperature reading minus wet bulb.

<sup>2</sup>Planting allowed if wind velocity is less than value in table for a given air temperature-wet bulb combination.

ATTACHMENT 2 - PLANTING/TUBING/SCALPING DIAGRAMS  
Exhibit 1

*Planting  
Procedure  
with Hoedad*



ATTACHMENT 2 - PLANTING/TUBING/SCALPING DIAGRAMS  
Exhibit 1

**Satisfactory and Unsatisfactory Plantings**

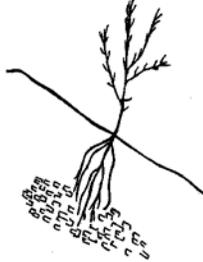
<p><b>SATISFACTORY</b></p> 	<p><b>SATISFACTORY</b></p> 	<p><b>Unsatisfactory</b></p>  <p>Too deep. Needles buried.</p>
<p><b>Unsatisfactory</b></p>  <p>Improper orientation. Not planted into the slope or near vertical.</p>	<p><b>Unsatisfactory</b></p>  <p>"L" roots. Shallow hole.</p>	<p><b>Unsatisfactory</b></p>  <p>"J" roots. Shallow hole. Roots often exposed.</p>
<p><b>Unsatisfactory</b></p>  <p>Jammed roots. Hole too narrow and shallow.</p>	<p><b>Unsatisfactory</b></p>  <p>Hole too shallow. Roots exposed.</p>	<p><b>Unsatisfactory</b></p>  <p>Air pocket because of improper tamping.</p>
<p><b>Unsatisfactory</b></p>  <p>Planted in rotten wood. Roots not in mineral soil.</p>	<p><b>Unsatisfactory</b></p>  <p>"U"- or "J"-shaped tap root.</p>	<p><b>Unsatisfactory</b></p>  <p>Compacted roots. Hole too narrow.</p>

Exhibit 2

TUBING INSTALLATION WITH BAMBOO

TOP VEIW

SIDE VEIW

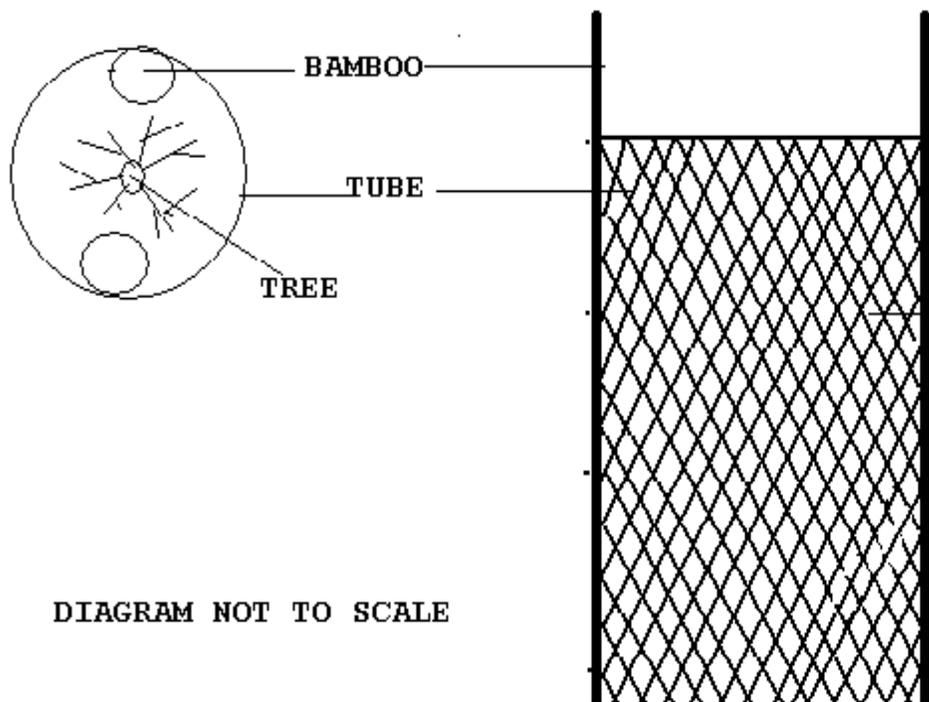


DIAGRAM NOT TO SCALE

TUBING INSTALLATION SHOWING WEAVE POINTS

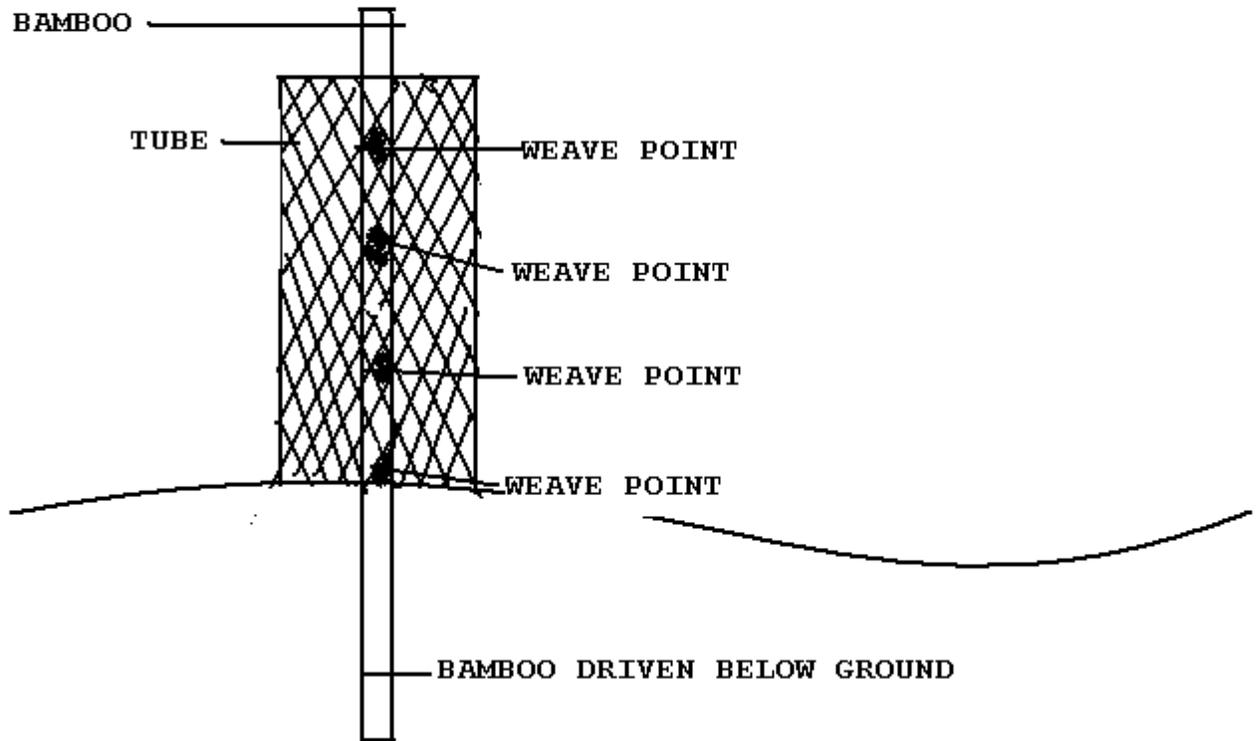


DIAGRAM NOT TO SCALE

**SECTION 5 - CONTRACTOR INSPECTION****1. CONTRACTOR INSPECTION PROCEDURES**

The Contractor shall provide and maintain an inspection system acceptable to the Government covering the projects under this contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to the Government during contract performance and for as long afterwards as the contract requires.

The Contractor shall inspect the work of their crews in any fashion chosen so long as the inspection procedure is thorough enough to ensure compliance with all of the planting specifications described herein. When the Contractor, through inspections and possible re-inspections is satisfied that the crew's planting work is in compliance with the contract specifications, the Contractor shall then request that the Government representatives perform an inspection.

**Project #5 - Mature Tree Topping - High girdling live/snag**

**End Result:** The end result will create old growth habitat for the marbeled murrelet and spotted owl, and other old growth dependent species.

**Measure of accomplishment:** Individual Trees

**Quantity:** 36 Trees

**Project Specifications**

Three areas, 4A, 9A and 10A, have been designated on the Contract Area Map as the locations to perform the mature tree topping work. The Table below indicates which area, to top mature trees for each.

Contract Area	Treatment Area ID	Operating season	Trees per group	Average DBH of Treated Trees	Trees to High-Girdle Snag	Trees to High-Girdle Live
High Tide Thin STWD	4A	Sept 15 - March 31	2-9	35-45"	9	9
High Tide Thin STWD	9A	Sept 15 - March 31	2-9	35-45"	4	5
High Tide Thin STWD	10A	Sept 15 - March 31	2-9	35-45"	4	5
<b>TOTALS</b>						

All trees selected will be live Douglas-fir or hemlock trees. Hemlock will not be treated where this species is less than 50% of the appropriate size class in the treatment area.

- 1) The intent is to promote development of a stove-pipe cavity with over-head cover in a live tree. Girdling to the specified standards will provide good conditions for fungi that cause heart-rot, and retaining live limbs below girdle site should keep the tree alive and allow upper most limbs to grow vertically and eventually provide cover over the developing cavity. Create snags and live trees in equal proportion within groups containing 2-9 girdled trees. However, a ten percent tolerance is acceptable; e.g., 40% snags and 60% live or vice versa.
- 2) **Distribution shall be clumped and at least 250' from any road.**
  - a) Group is defined as an area containing 3-5 trees that are within 50' of another treated tree of the same group.
  - b) Distance between groups shall be greater than 200 feet.
  - c) Locate groups around big-leaf maple trees where possible.
- 3) **Critical specifications**
  - a) **Girdle trees.**
  - b) **Girdle trees with limbs less than 6" diameter and not within 100' of a tree with limbs greater than 6" diameter to avoid risk to potential murrelet nesting habitat.**
  - c) **Girdled trees will generally be greater than 30" dbh but less than 50" dbh; dbh range of girdled trees should be 35-45" dbh.**
  - d) **Diameter at girdling height shall be greater than 15 inches outside bark.**

- e) Girdled trees for live trees shall retain 15-25 live limbs below the girdle site that are at least eight feet in length.
  - f) Girdled trees for snags shall retain 0-4 live limbs below the girdle site that are at least eight feet in length. Girdled height of snag trees shall be above 80'.
  - g) Girdled trees will have a minimum of 1-foot of bole area above the last whorl of green limbs after girdling. This will facilitate rot development above last live whorl.
- 4) Girdling live height is between 150-200 feet.
  - 5) Contractor will mark treated trees with a orange and white stripped flagging around the bole and orange tree number near dbh level.
  - 6) Two pieces of orange and white striped flagging shall be tied on a branch or around the bole directly below the girdle and shall extend a minimum of four feet, ensuring that it can be seen from the ground.
  - 7) The Contractor will furnish paint, flagging and aluminum nails. Government will furnish "Wildlife Tree" signs and numbered tags. Attach one "Wildlife Tree" sign on each girdled tree. Attach the sign using two aluminum nails at breast height facing the uphill side.
  - 8) Contractor will map location of each clump in each with GPS. GPS location of individual trees is not required. Coordinates are NAD 83, UTM's. Contractor must provide an electronic and written file of coordinates. Electronic transfer can be accomplished by one of three methods. All of these methods shall include coordinates and corresponding name, number, and clump number for each clump. These methods are:
    - i) **Preferred method** : Provide government with a GDB file with locations of clumps from Mapsource
    - ii) Contractor bring in their GPS and have coordinates with corresponding data downloaded directly to the government computer
    - iii) Contractor submit a CD with spreadsheet containing X column and Y column coordinates, and a column identifying corresponding data
  - 9) Contractor will map location of each individual tree within 300 feet accuracy.
  - 10) Contractor will label a Reference Tree at each treated that is live and easily visible from a main, drivable road. Mark with a band of orange and white stripped flagging and "R" painted above the band. Two pieces of orange and white striped flagging shall be tied on a branch or around the bole and shall extend a minimum of two feet, and point of tie facing the road. The contractor shall record the project name, project area number, bearing and approximate distance to the treated tree closest to the road, and the treated tree number on the flagging with a permanent marker. If the reference tree is over 200 feet from the closest treated tree, flag the route to the tree with orange and white striped flagging.
  - 11) The Contractor is REQUIRED to submit a weekly plan of work at least two days before implementing each weekly plan. This plan shall be submitted to the project Contract Administrator (CA).
  - 12) The Contractor is REQUIRED to inform the project CA within 7 days of when a /project area has been accomplished and provide a completed tree register form with signature and a map showing accurate location of clumps of treated trees and their corresponding tree-numbers.

**When: Work is restricted to September 16 through March 31**



**Project #6 - Road Decommissioning**

**Project Description:** Project consists of decommissioning five roads by removing all culverts and fills, installing water bars, and placing earthen berms at the beginning of the project areas. Access to roads 3, 4 and 5 will require travelling along an existing skid road through Unit 11. Culverts on roads not accessible by vehicle are tagged with a 4"x4" orange card and pink flagging.

**Access to Road 3, 4, and 5:** The access point to roads 3, 4 & 5 leaves road 2 from around landing 11B and travels easterly through the unit where it ties into the north end of road 3 in the bottom of Unit 11 (see area map). The approximate route is marked with three silver tags. The tags are arranged horizontally on the uphill side of the trees when travelling from road 2 in unit 11. The marked travel route to roads 3, 4 and 5 has one section of 45% to 55% for 300 feet and a brief section of side hilling where a skid road had previously been benched into the hill and may need minor work to widen. **This route only provides equipment access. There is no access for highway legal vehicles available for roads 3, 4 and 5.** Fuel and all other items necessary to complete work on these roads shall be brought in with the machinery used. Multiple trips with machinery will not be allowed. Multiple trips are defined as more than one round trip. ATV or other non-street legal vehicles are approved for use in transporting materials. Rehabilitate any excavation or ground disturbance caused by use of this route.

Road #	Beginning Termini	Ending Termini	Legal Description
1	MP 2.50 NFS 5200	MP 0.67	NFS 5200, SW 1/4 of SW 1/4 Section 30, T13S R9W
2	MP 3.06 NFS 5200	MP 0.20/ Unit 11	SW 1/4 of NW1/4 Section 30, T13S R9W
3	See Road 3 Work Listing and Notes		E 1/2 of NE 1/4 Section 30, T13S R9W
4	See Road 4 Work Listing and Notes		E 1/2 of NE 1/4 Section 30, T13S R9W
5	See Road 5 Work Listing and Notes		SE 1/4 of NE 1/4 Section 30, T13S R9W

The road surfacing of roads 1, 2 and 5 is aggregate; 3 and 4 is native surfacing.

**Completion Date:** Roads 2-5 shall be completed no later than October 15 of the same calendar year that logging on unit 11 of High Tide Thin is completed. Road 1 shall be completed no later than October 15 of the same calendar year logging on High Tide unit 12 and 13 is completed.

**Work Items:** All work is on portions of non-system forest roads previously used for logging units 11, 12 and 13.

Item Number	Work Item	Quantity	Description/Notes
1	Pull and Remove Culverts	14	15 and 18" ditch relief culverts; 15" - 24" stream culverts; normal fill. See specs below
2	Install Earthen Barricades	2	One at beginning of roads 1&2 to effectively close roads. See specs below
3	Install waterbars	25	See specs below

**Work Item # 1 - Culvert Removal and Disposal Specs and Location:**

The Contractor shall remove all culverts from specified roads 1-5. Specific stream pipe locations will be flagged in the field, and are listed in the following tables. Ditch relief locations are estimated; they may be flagged in the field.

Culvert Removal: The Contractor shall remove culverts as designated by the Government. The Contractor shall be responsible for disposal of the removed culverts in an approved, legal manner and for the payment of any required fees. Submit proof of legal disposal prior to final project acceptance.

Excavation of fill during culvert removal shall be accomplished in a manner that minimizes sedimentation from entering streams. Temporary sediment control structures such as silt fencing or straw bales for short term sediment abatement shall be installed as needed, immediately downstream before excavation on culverts that are running water.

Following culvert removal, any disturbed intermittent or perennial bed shall be reshaped to the natural stream gradient with sides sloped to a 2H to 1V grade or matched to the undisturbed side slopes associated with the channel where approved. The re-established channel shall have a bottom width of 10 feet on intermittent and perennial streams. Ditch relief culverts shall have a bottom width 1.5 times the existing pipe diameter. There are 3 known perennial stream beds within this project.

Excavate all fill material down to the original stream bed or bottom of pipe bedding and remove culverts. The removed fill material shall be placed against the cut slope and recontoured as close as possible to the original contours. The material shall be outsloped at a maximum of 20% gradient and no closer than 20 feet to the top of excavated areas along stream courses, seeps and springs. Do not place excavated material on cutbanks that exhibit evidence of seeps or springs. Trees cut or otherwise removed in the clearing area for the culvert removals shall be felled directionally in a manner that protects the trees outside the road prism from damage and shall be placed in the stream channel. Mulch the excavated area by placing removed brush, limbs and other vegetative materials on the exposed soil above the assumed high water mark. Utilize rocks and boulders from excavation in the restored stream channel to dissipate energy and control flow path at the former outlet location. Do not create areas which will cause head cutting.

**Road 1 Work Listing and Notes.**

Road 1 is the primary access to Units 12 and 13.

Culvert Designation	Culvert Diameter Size	Mile Post (M.P.)	Type
1	15"	0.14	Ditch relief
2	18"	0.21	Intermittent
3	18"	0.30	Ditch relief
4	18"	0.46	Ditch relief
5	18"	0.52	Perennial
6	18"	0.55	Ditch relief
7	18"	0.59	Ditch relief
8	18"	0.66	Ditch relief

**Road 2 Work Listing and Notes.**

Road 2 is the spur accessing unit 11 to landings B and C.

Culvert Designation	Culvert Diameter Size	Mile Post (M.P.)	Type
1	15"	Flagged	Ditch relief

**Road 3 Work Listing and Notes.**

Road 3 is an abandoned native surfaced spur constructed in the early 1960's. Culverts 1 & 3 are shallow fills. Culvert 3 is in a swale like area. Culvert 1 is being bypassed currently and the stream shall be left undisturbed in its current channel. Culvert 2 is located in a steep sided draw with a 25' fill. As much of the fill material as is possible shall be placed on the downgrade side of the fill/road intersection given the operating parameters of the particular machinery used.

Culvert Designation	Culvert Diameter Size	Mile Post (M.P.)	Type
1	15"	Flagged	Perennial
2	15"	Flagged	Perennial
3	15"	Flagged	Intermittent

**Road 4 Work Listing and Notes**

Road 4 is located near the junction with roads 3 and 5 and has similar history to road 3. The culvert is located in a swale like area. Place waterbars on the road.

Culvert Designation	Culvert Diameter Size	Mile Post (M.P.)	Type
1	15"	Flagged	Intermittent

**Road 5 Work Listing and Notes.**

The culvert on road 5 is accessed by travelling south from the junction of roads 3,4 and 5. The culvert is located in a partially eroded fill and the stream is flowing around the pipe. Remove culvert, reshape channel and removed fill material as staked.

Culvert Designation	Culvert Diameter Size	Mile Post (M.P.)	Type
1	24"	Flagged	Perennial

**Work Item #2 - Earthen Berm Road Closure Barricade Specs Location and Guidelines**

The Contractor shall place an earthen berm barricade to completely close off roads 1 and 2 to motor vehicle traffic. The barricade shall be placed at a location flagged in the field, or at the beginning of each project as described above. A Berm Barricade Typical Drawing is provided. Berm barricade shall be constructed to allow water drainage away from streams and other erodible surfaces.

**Work Item #3 - Waterbar Specs and Location Guidelines**

The Contractor shall storm proof designated roads by installing water bars at locations flagged in the field, listed on work sheets, or at intervals as designated on the Typical Diagram(s) provided. The Government may increase or decrease the spacing intervals so as to fit specific road conditions.

Water bars shall be constructed so as to channel water away from existing ditch lines and across the road surface to the outside of the road shoulder. Water bars shall be self-maintaining. Do not place waterbars in locations that will likely concentrate water on unstable areas. See Water Bar Typical.

Water Bar Location Process

The first step is to plan for water bars at critical locations using guidelines for water collection and discharge. Then select additional locations to meet spacing requirements shown in Table 1. See attached drawing for typical water bar locations.

Water Collection Guidelines

Place water bars at natural small drainages that may not have justified a ditch relief culvert at the time of design. Try to keep as much of the water in its natural route as possible even if it requires an extra water bar.

Place water bars to back-up removed culverts that provided ditch relief or natural channel flow.

Place water bars to prevent road surface and cut bank sedimentation from entering directly into natural drainage channels.

Place water bars to dissipate water prior to steep grades.

Place water bars at road seeps, springs and wet subgrades to collect this water and quickly discharge it off the road. These areas may be notorious for potholes or fill failure.

Place water bars to effectively reduce ditch erosion. Reduce the upper reach of the ditch by a length greater than the area showing ditch erosion. For example: if the lower 90 feet of ditch shows signs of erosion, eliminate at least the first 90 feet of ditch by using a water bar.

Water Discharge Guidelines - consider these items for all waterbars.

Discharge onto undisturbed areas, preferable rocky ground or areas protected with vegetative cover.

Avoid discharging directly over fills. Seek natural ground areas first and then areas along edges of fills.

On steep slopes, discharge on convex slopes rather than draws.

Avoid crossing road or shoulder cracks especially where steep slopes or side cast construction is evident.

If a vegetated or rocky location is not found, reduce water bar spacing to match native soil conditions found in Table 1.

Water Bar Spacing Guidelines

Water bar location may be determined by measuring or estimating the distances and grades in Table 1. The road surface for this project is aggregate and contractor will use recommended spacing provided below for aggregated surfaced with vegetated/rocky discharge points. Care should be taken not to exceed 150% of distances shown. During storms in 1996 several water bars exceeding 150% of recommended spacing received so much water that the water bars themselves had excessive erosion.

The spacing shown for native surface roads is typical for most of the Siuslaw's soils. If fine and light soils (silt & silty sands) are encountered, reduce spacing by 20%. If silty clay or sandy clay soils are encountered, spacing may be increased up to 50%.

Table 1 Typical Water Bar Spacing

Road grade	Aggregate surfaced with vegetated/rocky discharge point		Native surface or barren soil discharge points	
	Feet	Meters	Feet	Meters
1-3	600	200	100	35
4-6	300	100	80	25
7-9	200	70	70	23
10-12	150	50	60	20
13-18	120	40	50	15
19+	80	25	30*	*

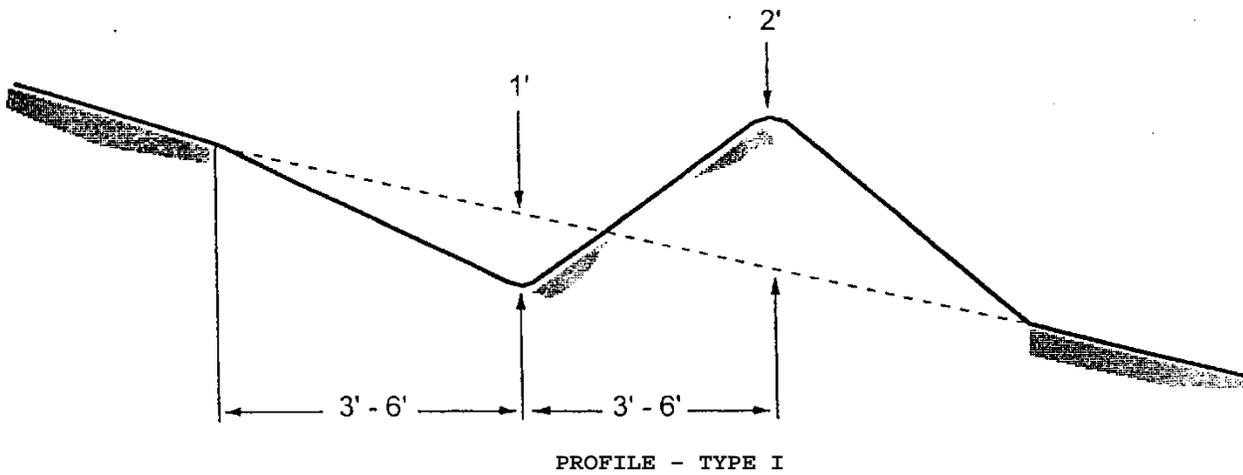
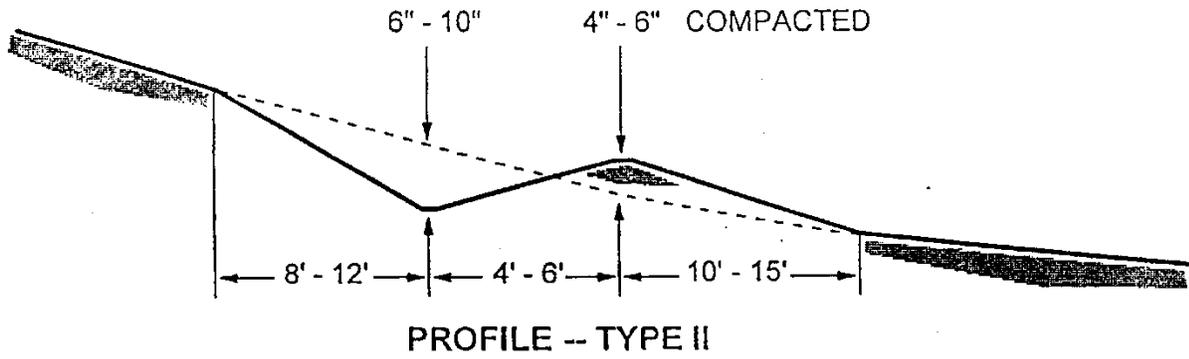
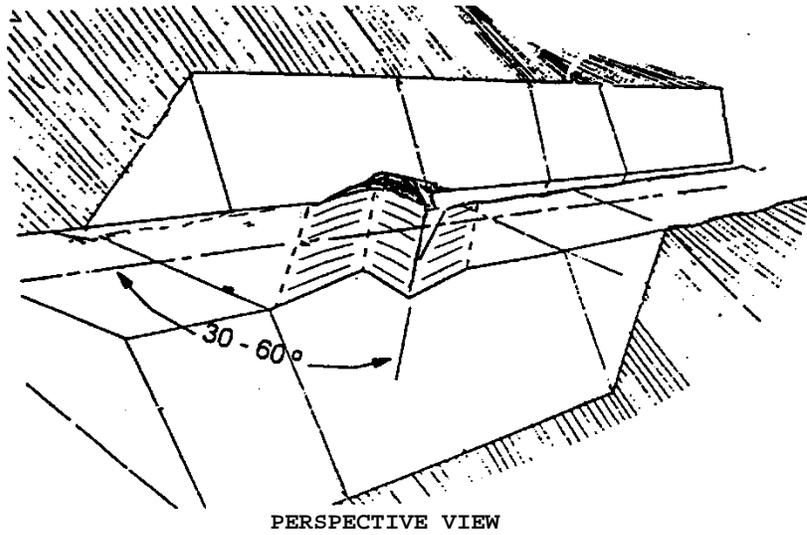
\*Consider using surface protection measures such as aggregate.

Water bar Construction Guidelines: This project will use Type I waterbars.

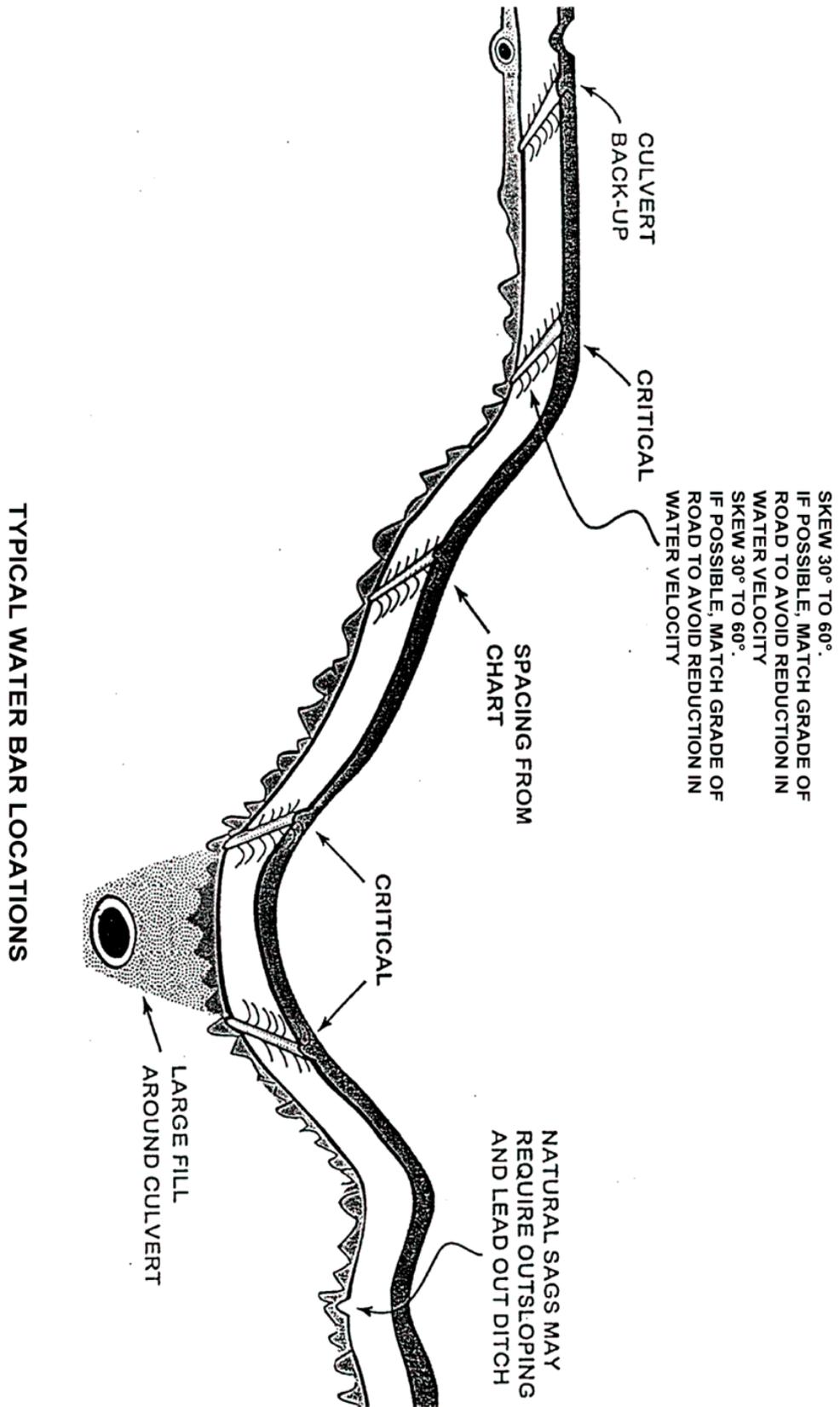
Type I Water Bars: Intended for use on roadbeds that will not have traffic. Use on closure of temporary roads, roads to be obliterated, decommissioned or long term closure of roads in maintenance level I. These water bars are designed to remain effective until the road prism stabilizes with vegetation.

- AGGREGATE ROADS  
Water bars that cut through the aggregate base of a road and reach erosive soils need to have aggregate surfacing bladed back into the water bar channel.
- COMPACTION OF BERM  
Compaction of the excavated material used to make the berm on the downhill side of the water bar is recommended. Wheel-rolling or walking the excavation equipment over the downhill berm is adequate.
- ROADSIDE DITCHES  
Intercept ditch water by including a ditch block during construction of all water bars.
- SKEW  
Construct with a 30 to 60 degree angle from road centerline.
- DEPTH and WIDTH  
Construction dimensions for a water bar are shown on the attached typicals. For road grades over 10%, the cut depth and berm height should approach maximum values.

WATER BAR CONSTRUCTION DETAILS

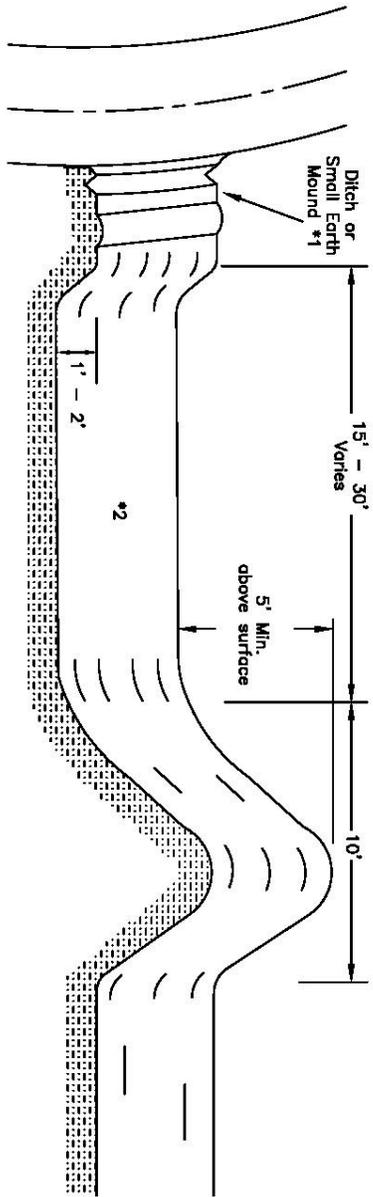


NOTE: Block ditchline with excavated material to prevent ditch water from bypassing waterbar.

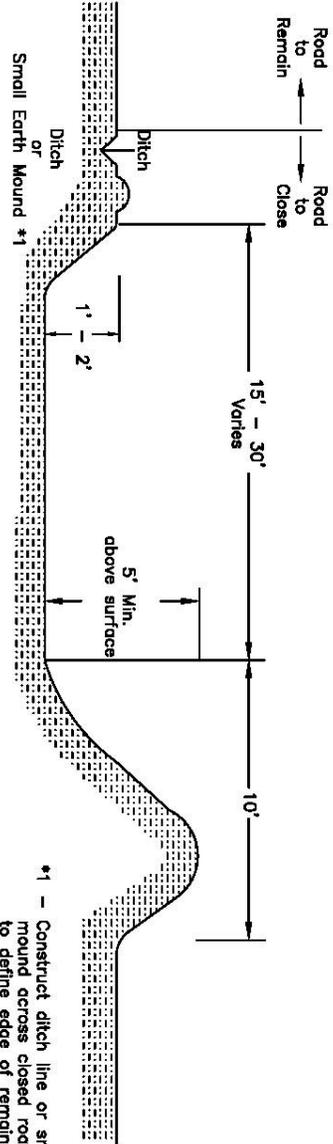


ROAD CLOSURE - EARTH MOUND TYPICAL

PROJECT SHEET	TOTAL SHEETS
---------------	--------------



ISOMETRIC VIEW

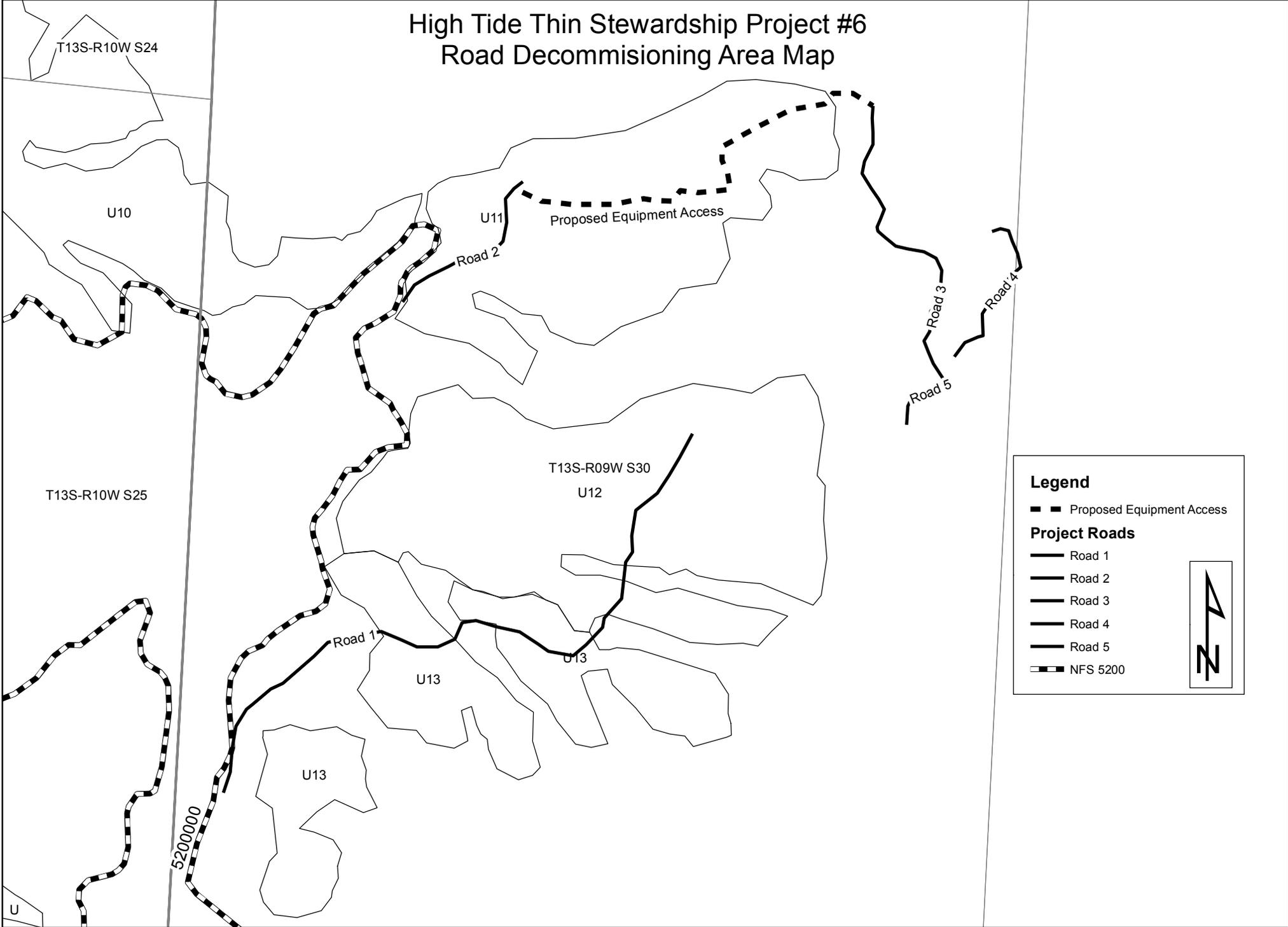


PROFILE VIEW

- \*1 - Construct ditch line or small earth mound across closed road entrance to define edge of remaining road.
- \*2 - Slope Excavation area to drain

6-15-05

# High Tide Thin Stewardship Project #6 Road Decommisioning Area Map



### Legend

- Proposed Equipment Access
- Project Roads
  - Road 1
  - Road 2
  - Road 3
  - Road 4
  - Road 5
  - NFS 5200

