



Oregon Department of Forestry
 2600 State St Salem OR 97310
 PART III: EXHIBITS

EXHIBIT B
TIMBER SALE OPERATIONS PLAN
 (See page 2 for instructions)

Date Received by State: _____

(5) State Brand Information (Complete)

(1) Contract Number: KL-341-2024-GF8023-01

(2) Sale Name: Replacement - GNA

(3) Contract Expiration Date: 10/31/2026

(4) Purchaser Name: _____

(6) State Representatives:

<u>Name</u>	<u>Circle One</u>	<u>Phone No.</u>	<u>Cell No.</u>	<u>Alt Phone</u>
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			

(7) Purchaser Representatives:

<u>Name</u>	<u>Circle One</u>	<u>Phone No.</u>	<u>Cell No.</u>	<u>Alt Phone</u>
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			

(8) Name of Subcontractors and Start Dates:

<u>Project No.</u>	<u>Subcontractor Name.</u>	<u>Start Date</u>	<u>Completion Date</u>	<u>Cell No.</u>	<u>Alt Phone</u>

	<u>Subcontractor Name.</u>	<u>Start Date</u>	<u>Cell No.</u>	<u>Alt Phone</u>
FELLING				
YARDING				

(9) Comments:

(10) Operations Map: Attach a copy of timber sale Exhibit A or other suitable map which plainly shows the items listed on the instruction sheet.



Oregon Department of Forestry

2600 State St Salem OR 97310

PART III: EXHIBITS

EXHIBIT B

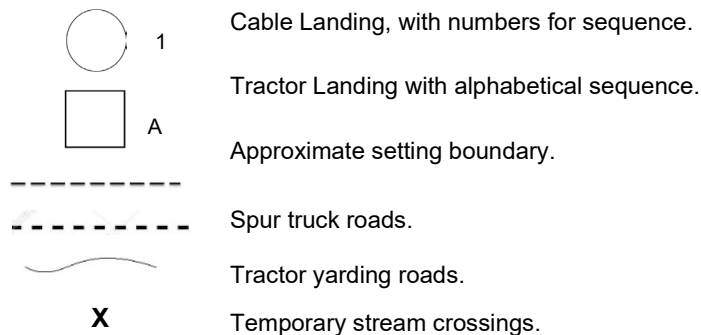
INSTRUCTION SHEET FOR OPERATIONS PLAN

SUBMIT ONE COPY OF PLAN STATE

Operations shall be limited to the work shown in the plan until a revised plan or supplemental plan is submitted covering additional work. Compliance with this plan is not in lieu of compliance with any federal requirements related to the federal Endangered Species Act including without limitation PURCHASER'S independent obligation to avoid take of a T&E species and PURCHASER'S obligation to comply with terms and conditions of any incidental take Permit(s) that include required minimization and mitigation measures in any applicable Habitat Conservation Plan. If STATE has prepared a required Forest Practices Act (FPA) "Written Plan" for operations, PURCHASER shall comply with all provisions of the Written Plan.

Explanation of Item No.(from Page 1)

- (5) All sales require you to use a brand furnished by STATE. If the State brand has not been assigned when the plan is submitted, it will be furnished and assigned later. Complete drawing. If more than one brand is assigned to the sale, complete both drawings.
- (6) The contract requires you to have a designated representative available on the sale area or work location who is authorized to receive in your behalf any notice or instruction given by STATE and to take action in regard to performance under the contract. If logging and project work is widely separated, a representative is required for each.
- (7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.
- (8) Show names of subcontractors to be used for any or all phases of the operations. If subcontractors are not Known, or are changed later, give notification to the STATE representative prior to commencement of work by subcontractor.
- (9) Show projected dates for commencement of both projects and logging. If projected dates need to be changed at a later date, notification must be given to the STATE representative by supplemental plan or otherwise, prior to commencement of such operations.
- (10) The STATE representative will furnish extra copies of Exhibit A of the contract for your use in preparing the operations map. The map shall use the following legend and show:
 1. Landing locations, approximate setting boundaries, and probable sequence of logging the settings. Number the settings in sequence.
 2. Locations of spur roads planned for construction, other than required by the timber sale contract. Provide spur road specifications
 3. Locations of proposed tractor yarding roads. Show if and how marked on the ground.
 4. Locations of temporary stream crossings.
 5. List the sequence of performing project work.
 6. Location of rock sources - attach pit development plans.



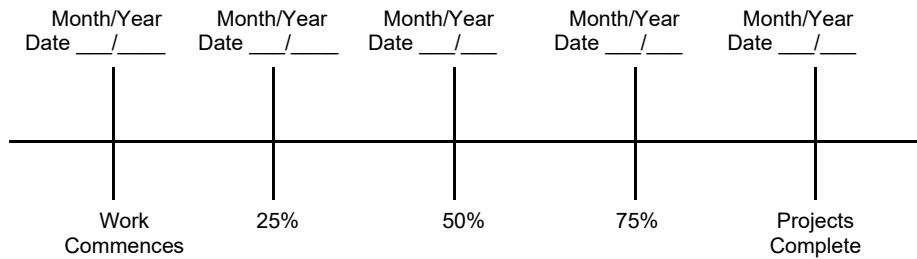


Oregon Department of Forestry
 2600 State St Salem OR 97310
 PART III: EXHIBITS
EXHIBIT B
OPERATIONS PLAN

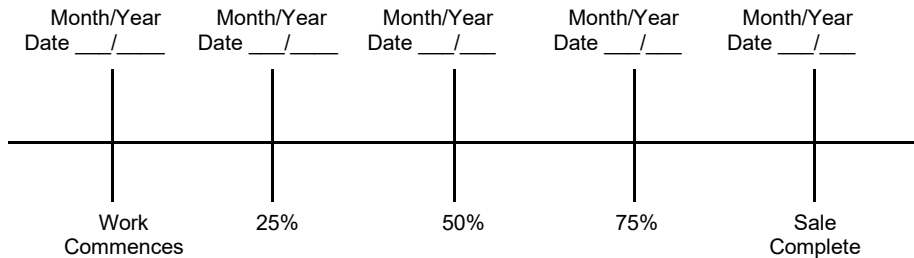
Completion Timeline

Indicate on the appropriate timeline below, the dates by which you plan to complete the work as required under this contract. The purpose of this section is to develop a plan that will ensure you complete the work as required, and meet the interim completion date(s) and contract expiration date. This plan is incorporated and made a part of the contract. When, in the opinion of STATE, operations are not commencing in a manner that meets the intent of this plan, you may be placed in violation of contract and your operations suspended until an amended plan is submitted and approved by STATE.

Projects



Harvest & Other Requirements



The Federal Endangered Species Act (ESA) prohibits a person from taking any federally listed threatened or endangered species. Taking under the federal ESA may include alteration of habitat. STATE's approval of this plan does not certify that PURCHASER's operation under the plan is lawful under the federal ESA or that the plan is consistent with the terms and conditions of any applicable incidental take Permit(s) including any required minimization and mitigation measures proposed in the applicable Habitat Conservation Plan. As provided in the timber sale contract, PURCHASER's must comply with all applicable state, federal, and local laws, including without limitation any Permit(s) issued thereunder.

PURCHASER's compliance with this plan is not in lieu of compliance with any federal requirements related to the federal Endangered Species Act.

APPROVED; Date: _____

SUBMITTED BY:
PURCHASER

STATE OF OREGON - DEPARTMENT OF FORESTRY

Title _____

Title _____



Oregon Department of Forestry
EXHIBIT C - SAWMILL GRADE (EASTSIDE SCALE)
SCALING INSTRUCTIONS - LOCATION APPROVAL - BRAND INFORMATION
Klamath-Lake - EOA

(1) ORIGINAL REGISTRATION Date _____
 REVISION NUMBER 000 Date _____
 CANCELLATION Date _____

(2) TO: _____
 (Third Party Scaling Organization)

(3) FROM: Klamath-Lake Phone (541) 883-5681
 (State Forestry District)
 Address: 3200 DELAP RD
KLAMATH FALLS, OR 97601

(4) PURCHASER: _____
 Mailing Address: _____

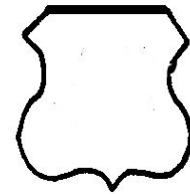
 Phone Number: _____

(9) **SALE NAME:** Replacement - GNA
COUNTY: Klamath

(10) **STATE CONTRACT NUMBER:**
KL-341-2024-GF8023-01

(11) **STATE BRAND REGISTRATION NUMBER:**

(12) STATE BRAND INFORMATION:



(13) PAINT REQUIRED: YES
 COLOR: Orange

(5) MINIMUM SCALING SPECIFICATIONS	
SPECIES	MINIMUM NET VOLUME
Conifers	10
Hardwoods	10

*Apply minimum volume test to whole logs over 20' Eastside

(14) **SPECIAL REQUESTS** (Check applicable)

PEELABLE CULL (all species).....	<input type="checkbox"/>
NO DEDUCTIONS ALLOWED FOR MECHANICAL DAMAGE	<input checked="" type="checkbox"/>
PENCIL BUCK.....	<input type="checkbox"/>
ADD-BACK VOLUME - Deductions due to delay...	<input checked="" type="checkbox"/>

OTHER :

(15) **REMARKS:**

"Mule Trains"
 1. Loads are required to have load tickets for each set of bunks.
 2. If truck and pup are to be weighed, weigh and process separately for gross and tare weights.

Operator's Name (Optional inclusion by District): _____

(16) SIGNATURES:

 Purchaser or Authorized Representative Date

 State Forester Representative Date

 State Forester Representative PRINT NAME

(7) Weight Scale Sample YES NO

(8) APPROVED SCALING LOCATIONS (as shown on the ODF Approved Locations web-site)	Species	Yard	Truck	Weight



Oregon Department of Forestry
EXHIBIT C - SAWMILL GRADE
INSTRUCTIONS FOR EXHIBIT C
Klamath-Lake - EOA

- (1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires logging and hauling to be complete, recall branding hammers.
- (2) Designate Third Party Scaling Organization (TPSO).

<p>Columbia River Log Scaling & Grading Bureau P.O.Box 7002, Eugene, OR 97401 Phone: (541) 342-6007 Fax: (541) 342-2631 Email: services@crls.com</p> <p>Mountain Western Log Scaling & Grading Bureau 2560 NW Medical Park Drive, Roseburg, OR 97471 Phone: (541) 673-5571 Fax: (541) 672-6381 Email: info@mwlsqb.com</p> <p>Northwest Log Scalars Inc. 6137 NE 63rd St, Vancouver, WA, 98661 Phone: (360) 553-7212 ext. 4 Fax:(360) 553-7213 Email: info@nwlogscalars.com</p>	<p>Pacific Rim Log Scaling Bureau, Inc. 8288 28th Court North East, Lacey, WA 98516 Phone: (360) 528-8710 Fax: (360) 528-8718 Email: office@prlsb.com</p> <p>Yamhill Log Scaling & Grading Bureau P.O.Box 709, Forest Grove, OR 97116 Phone: (503) 359-4474 Fax: (503) 359-4476 Email: yamhilllog@frontier.com</p>
---	---
- (3) State District office, address and phone.
- (4) Enter Purchaser's business name, address, and phone number as it appears on the Contract.
- (5) Minimum Scaling Specifications. Scaling diameter inches is used for pencil buck minimum diameter.
- (6) Eastside - Region 6 actual taper segment scale. Check Yes or No. Special Service Rules on file with TPSO. See: Segment Scaling and Grading of Long Logs - All Species - State Forestry Department Scaling Practices (Northwest Log Rules Eastside). Items with * follow U.S. Forest Service Eastside rules.
- (7) Weight Scale Sample - Check box if sale is to be a Weight Scale Sample. All specifies for handling, scaling and processing will be attached or explained in the Remarks section item (15).
- (8) Show scaling locations only applicable to TPSO. Location name should appear as it does on the ODF Approved Scaling Location web site: https://apps.odf.oregon.gov/Divisions/management/asset_management/scalinglocation.asp Locations with scaling and processing directions specific to their location should be on a separate form. Species should be identified if not capable of receiving "all" species. Check appropriate box for either: yard, truck scale, or weight. Refer to the web site listed above for the locations approval status.
- (9) Enter sale name and county.
- (10) Enter sale Contract number.
- (11) Enter Oregon's State Brand Registry Number (**REQUIRED**).
- (12) Show brand assigned to timber sale. One brand only. If more than one brand is assigned to the sale: (1) make a separate form for each brand and (2) on each form, explain and show other brand(s) in the Remarks section item (15).
- (13) Check yes for Paint Required and designate "Orange" for color. Non required removal volumes may sometimes require blue paint.
- (14) Special Requests. These are requests that will be applied to ODF timber sales. All boxes applicable to the timber sales designated in the Exhibit C form must be "marked". If "Other" is indicated, it must contain a description and any necessary comments.
- (15) Use this space to designate any weight scale sample instructions or any other explanations to clarify scaling, processing and/or mailing requirements. If additional scaling locations are approved, revise original or current form showing all (old and new) locations. Check REVISION box at top of form and explain under remarks. Route as indicated.
- (16) Require purchaser to sign and date completed form in addition to State Forester Representative, sign and print name on the form. Signatures not required on revisions.



**Oregon Department of Forestry
 EXHIBIT C - PULP SORT
 PROCESSING INSTRUCTIONS - LOCATION APPROVAL
 BRAND INFORMATION**

Klamath-Lake, EOA

(1) ORIGINAL REGISTRATION Date _____
 REVISION NUMBER 000 Date _____
 CANCELLATION Date _____

(2) TO: _____
 (Approved Pulp Processing Facility)

(3) FROM: Klamath-Lake Phone (541) 883-5681
 (State Forestry District)
 Address: 3200 DELAP RD
KLAMATH FALLS, OR 97601

(4) PURCHASER: _____

(5) Scaling Bureau (TPSO) Processing Weight receipts:

Mailing Address: _____

Phone Number: _____

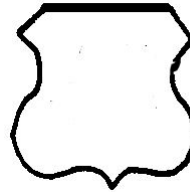
(9) SALE NAME: Replacement - GNA

COUNTY: Klamath

(10) STATE CONTRACT NUMBER:
KL-341-2024-GF8023-01

(11) STATE BRAND REGISTRATION NUMBER: _____

(12) STATE BRAND INFORMATION:



(13) REMARKS:
 "Mule Trains"
 1. Loads are required to have load tickets for each set of bunks.
 2. Truck and pup are to be weighed and processed separately for gross and tare weights.

Operator's Name (Optional inclusion by District):

(14) SIGNATURES:

 Purchaser or Authorized Representative Date

 State Forester Representative Date

 State Forester Representative PRINT NAME

(6) STATE Definition of Approved Pulp Sort:
 • Top portion of the tree (tops).
 • All logs with a diameter (Big End) greater than 10 inches marked with blue paint.

(7) PULP FACILITY PROCESSING INSTRUCTIONS:
 • Pulp loads shall be weighed in lieu of scaling.
 • One Ton = 2000 lbs (Short Ton).
 • Pulp loads shall have a yellow Log Load Receipt attached.
 • Gross weight and truck tare weight for each load shall be machine printed on the weight receipt.
 • Weigher shall sign the weight receipt.
 • Weigher shall record the Log Load Receipt number on the weight receipt.
 • Weigher shall attach the Weight receipt to the Log Load Receipt and mail them weekly to the TPSO processing the Weight receipt.

(8) TPSO PROCESSING INSTRUCTIONS
 • Submit data files daily (or each day of activity).
 • Mail or deliver scale tickets weekly to ODF Headquarters in Salem.

Notify the District within one hour when branding is inadequate for quick identification, the logs are marked with orange paint, the receipts are missing, not correctly or completely filled out, and/or logs do not meet the specifications of the STATE definition of Approved Pulp Sort.

General Distribution: TPSO, Approved Scaling Locations and Purchaser.



Oregon Department of Forestry EXHIBIT C - PULP SORT INSTRUCTIONS FOR EXHIBIT C

Klamath-Lake, EOA

- (1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires logging and hauling to be complete, recall branding hammers.
- (2) Approved Pulp Processing Facility. Write in as written in the Approved Log Delivery Location https://apps.odf.oregon.gov/Divisions/management/asset_management/scalinglocation.asp
- (3) State District office, address and phone.
- (4) Enter Purchaser's business name, address, and phone number as it appears on the Contract.
- (5) Third Party Scaling Organization that will be processing the weight tickets, mailing address, and phone number.

Columbia River Log Scaling & Grading Bureau
P.O.Box 7002, Eugene, OR 97401
Phone: (541) 342-6007 Fax: (541) 342-2631
Email: services@crls.com

Pacific Rim Log Scaling Bureau, Inc.
8288 28th Court North East, Lacey, WA 98516
Phone: (360) 528-8710 Fax: (360) 528-8718
Email: office@prlsb.com

Mountain Western Log Scaling & Grading Bureau
2560 NW Medical Park Drive, Roseburg, OR 97471
Phone: (541) 673-5571 Fax: (541) 672-6381
Email: info@mwlsgb.com

Yamhill Log Scaling & Grading Bureau
P.O.Box 709, Forest Grove, OR 97116
Phone: (503) 359-4474 Fax: (503) 359-4476
Email: yamhilllog@frontier.com

Northwest Log Scalars Inc.
6137 NE 63rd St, Vancouver, WA, 98661
Phone: (360) 553-7212 ext. 4 Fax:(360) 553-7213
Email: info@nwlogscalars.com

- (6) Big end of log is not to exceed 2 inches greater than the minimum removal specifications in the contract. Example: Minimum removal specifications 6 inches and 20 board feet, then the Big end of log not to exceed 8 inches. When conifer and hardwood removal specifications are different, use the smaller removal diameter to determine this specification.
- (9) Enter sale name and county.
- (10) Enter sale Contract number.
- (11) Enter Oregon's State Brand Registry Number **(REQUIRED)**.
- (12) Show brand assigned to timber sale. One brand only, if more than one brand is assigned to the sale: (1) make a separate form for each brand and (2) on each form, explain and show other brand(s) in the Remarks section Item (13).
- (13) Use this section to list any special instructions or the reason for any revisions in section item (1).
- (14) Require purchaser to sign and date completed form in addition to State Forester Representative, sign and print name on the form. Signatures not required on revisions.

EXHIBIT D
 FOREST ROAD SPECIFICATIONS

CONSTRUCTION

SUBGRADE WIDTH	RUNNING WIDTH	POINT TO POINT	DRAINAGE
15 feet	12 feet	H to I	Shape to Drain
15 feet	12 feet	P to Q	Shape to Drain

IMPROVEMENT

SUBGRADE WIDTH	RUNNING WIDTH	POINT TO POINT	DRAINAGE
15 feet	12 feet	C to D	Shape to Drain
15 feet	12 feet	J to K	Shape to Drain
15 feet	12 feet	N to O	Shape to Drain
15 feet	12 feet	E to F	Shape to Drain
15 feet	12 feet	G to H	Shape to Drain
15 feet	12 feet	L to M	Shape to Drain
15 feet	12 feet	R to S	Shape to Drain
15 feet	12 feet	T to U	Shape to Drain
15 feet	12 feet	V to X	Shape to Drain
15 feet	12 feet	V to W	Shape to Drain
15 feet	12 feet	A to B	Shape to Drain

CLEARING. This work shall consist of clearing, removing, and disposing of all trees, Snags, Down Timber, brush, surface objects, and protruding obstructions within the clearing limits.

Where clearing limits have not been marked, the clearing limits shall extend 4 feet back of the top of the cutslope and 4 feet out from the toe of the fill slope, or as directed by STATE. Clearing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing debris shall not be left lodged against standing trees.

All danger trees, leaners, and Snags outside the clearing limits which could fall and hit the road shall be felled.

For road segments with abundant down trees across the road surface this material will be removed and piled to burn in stand openings adjacent to the right of way prior to grubbing work.

GRUBBING. This work shall consist of the removal or digging out of stumps and protruding objects.

All stumps shall be completely removed within the limits of required grubbing. Stumps overhanging cut slopes shall be removed. Grubbing debris shall not be left lodged against standing trees.

EXHIBIT D
FOREST ROAD SPECIFICATIONS

GRUBBING CLASSIFICATION.

Improvements and reconstructions - 4 feet back from the shoulder of the subgrade or ditch, whichever is widest, or as marked in the field.

CLEARING AND GRUBBING DISPOSAL. Scatter in stable locations through openings in the timber outside of the cleared right-of-way, except areas where end-haul is required. In areas where end-haul is required, clearing and grubbing debris shall be fully contained and hauled to a designated waste area. Clearing and grubbing debris shall be left in a stable location, and not left lodged against standing trees.

EXCAVATION. Excavation and grading shall not be done when weather and/or ground conditions are such that damage will result to existing subgrade or cause excessive erosion.

Unless road plans show otherwise, all roads shall be on a balanced cross section, except when the slope is over 60 percent, the road shall be on full bench for the width specified.

Suitable excavated material shall be used for the formation of fills, shoulders, and drainage structure backfills. Embankment materials shall be free of woody debris, brush, muck, sod, frozen material, and other deleterious materials.

Sidecast includes any road generated excess excavation material which is not essential as part of the road prism, is not compacted, and is below the roadway. Sidecast shall not be placed where it will enter a stream course. Sidecast shall be placed in stable locations as directed by STATE in this Exhibit.

All fills shall be machine compacted as directed by STATE in this Exhibit.

ROAD WIDTH LIMITATIONS. PURCHASER shall obtain advance written approval from STATE to construct the road to a greater width than specified.

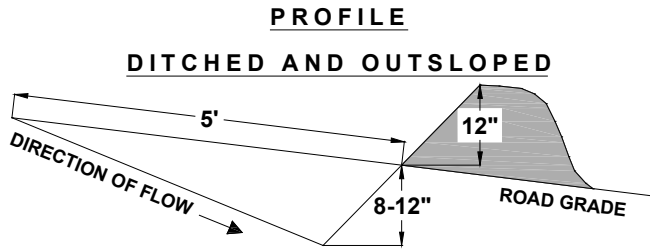
Curve Widening. Widen the inside shoulder of all curves as specified in the plans or as follows: 400 divided by the radius of the curve equals the amount of extra width.

DRAINAGE

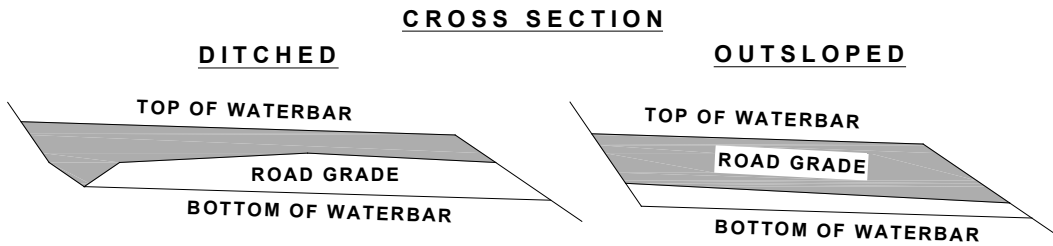
Subgrade. Subgrade shall be crowned insloped at 4 to 6 percent as shown on the "Forest Road Specifications" table in this Exhibit.

Ditchouts. Construct ditchouts to drain away from subgrade at locations marked in the field or as directed by STATE.

EXHIBIT E
 WATERBAR SPECIFICATIONS



SPACING OF WATERBARS	
ROAD GRADE	DISTANCE
< 6 %	400'
6 - 10 %	200'
11 - 15 %	150'
> 15 %	100'



CONSTRUCT DITCHOUT THRU ANY EXISTING BERM.
 CROSS DRAINAGE GRADIENT MINIMUM 3%.

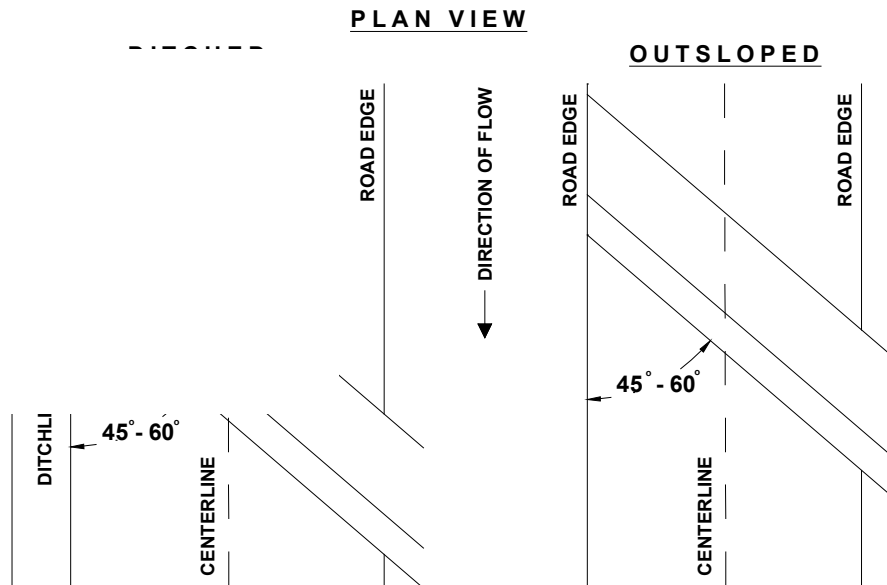


EXHIBIT F
TREE CLUMP GUIDE

Guide for Medium and Large Clumps

The goal of leaving clumps is to create or maintain variable spatial patterns in the treatment units. The targets should not be applied in a rigid manner, but instead used as “guard rails” to inform whether too little or too much variability is being created. Use existing tree and biophysical conditions to create variable patterns within and across treatment units and avoid trying to force the same density and variability on every acre. For example, medium and large clumps can be concentrated in areas where good leave tree candidates exist. Underlying variation in soils, topography, and disturbance processes can also be used to adjust clumping levels across a unit (e.g., leave more clumps on north-facing slopes).

Definitions:

- Aspen clump – a group of at least 5 live aspen trees at least 5 feet tall within 30 feet of another aspen tree in the clump.
- Healthy/desirable tree – fuller crown, darker foliage, and free of broken/forked tops, mistletoe or insect damage.
- Mature tree – a tree that appears greater than 150 years old. Van Pelt rating system (Van Pelt 2008) would be used to identify trees over 150 years old. Refer to Exhibit I.
- Medium clump – a group of 5 to 9 trees within 20 feet of another tree in the clump.
- Large clump – a group of 10 to 15 trees within 20 feet of another tree in the clump.
- Distances are measured slope distance to face of the tree.

Guide:

1. Leave one medium clump per 1 acre and one large clump per 3 acres.
2. Trees in a clump shall be all one species.
3. Medium clumps should generally be created using younger, desirable trees, but mature and/or large diameter trees may exist in this condition.
4. Large clumps should generally be created using healthy trees in close proximity, but mature and/or large diameter trees may exist in this condition.
5. Do not place a clump of young trees within 40 feet of a mature tree or within 60 feet of an aspen clump.

EXHIBIT G

Guide for Identifying Mature Trees

Ponderosa Pine

Rating system for determining the general age of ponderosa pine trees

(Choose one score from each category and sum scores to determine developmental stage)

Lower trunk bark condition	Score
Dark bark with small fissures	.0
Outermost bark ridge flakes reddish, fissures small.	.1
Colorful plates, width about equal to fissure widths	.2
Maximum fissure to fissure plate width \geq 15 cm (6 in) and $<$ 25 cm (10 in)	.3
Maximum fissure to fissure plate width \geq 25 cm (10 in)	.5
Knot indicators on main trunk below crown	
Dead branches below main crown, whorl indicators extending nearly to tree base	.0
Old knot/whorl indicators visible below main crown	.1
No knot/whorl indicators visible	.3
Crown form (refer to Figure 69)	
Similar to a tree in top row	.0
Similar to a tree in middle row	.3
Similar to a tree in bottom row	.5

Scoring Key

- $<$ 2 Young tree
- 2-5 Mature tree $<$ 150 years
- 6-10 Mature tree \geq 150 years
- $>$ 10 Old tree \geq 250 years



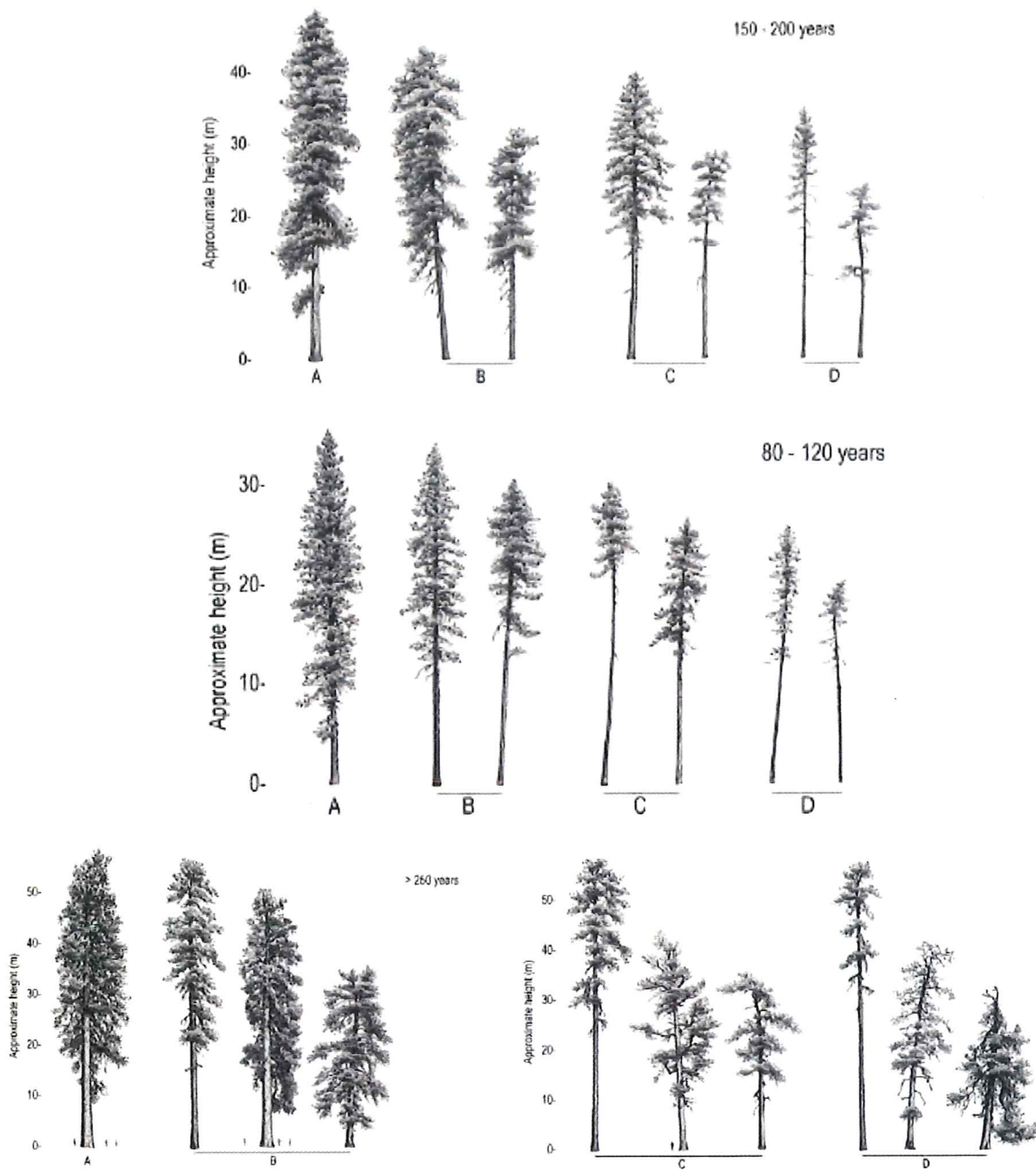
134 years 164 years 227 years

Figure 60. Bark patterns on mature ponderosa pine. Note residual charcoal in the center photo.



271 years 304 years

Figure 61. Bark patterns on old ponderosa pine. The colorful bark plates are generally more than three times wider than the darker fissures that separate them.



Douglas-Fir

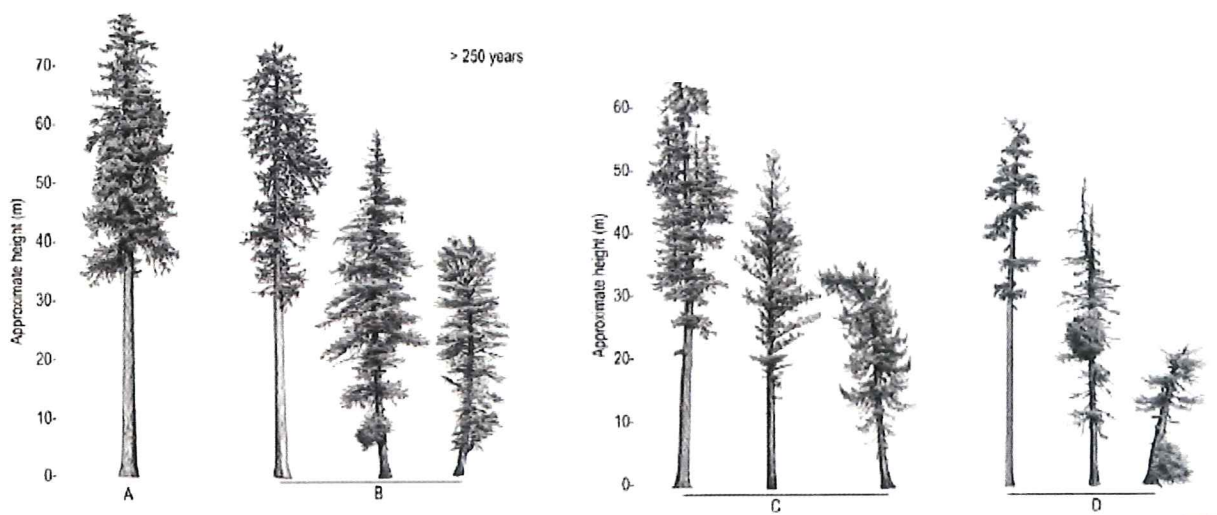
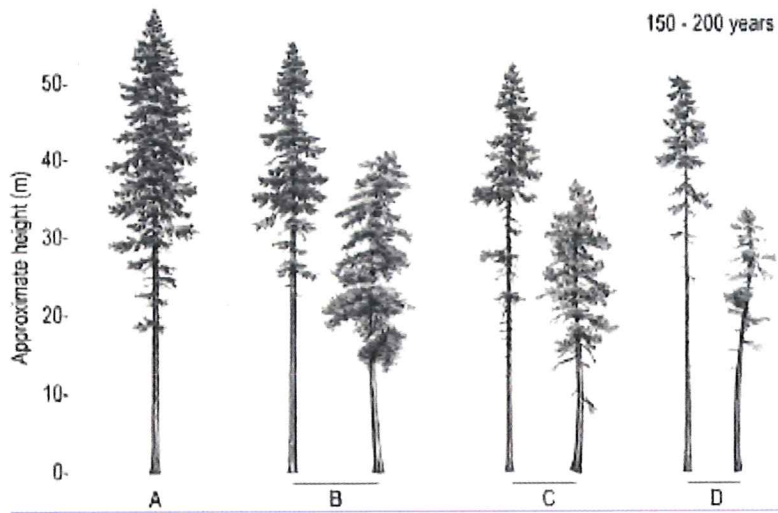
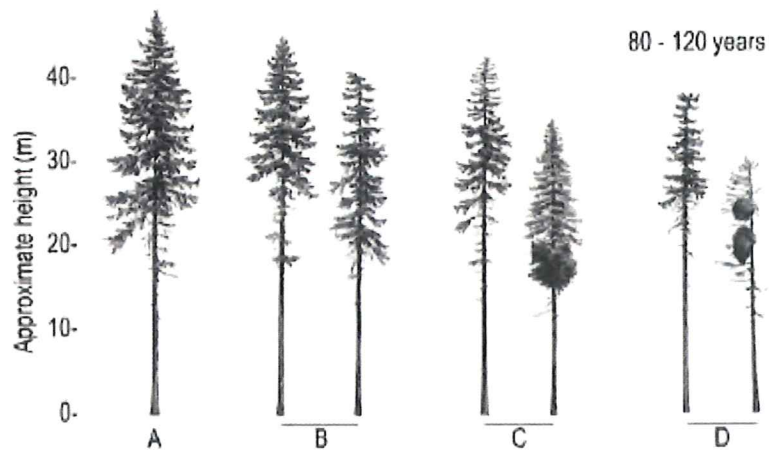
Rating system for determining the general age of Douglas fir trees

(Choose one score from each category and sum scores to determine developmental stage)

Bark condition, lower one-third of tree	Score
Hard, bony bark with small fissures . . . . .	.0
Hard bark with moderately deep fissures (4-10 cm – 2-4 in) . . . . .	.1
Deep fissures present (> 10 cm – 4 in) . . . . .	.3
Knot indicators, lower one-third of tree	
Branch stubs present . . . . .	.0
Old knot/whorl indicators visible . . . . .	.1
No knot/whorl indicators visible . . . . .	.3
Lower crown indicators	
No epicormic branches . . . . .	.0
Small epicormic branches present . . . . .	.1
Large and/or gnarly epicormic branches present . . . . .	.3
Crown form (refer to Figure 109)	
Similar to a tree in top row . . . . .	.0
Similar to a tree in middle row . . . . .	.3
Similar to a tree in bottom row . . . . .	.5

Scoring Key

< 3	Young tree
3–6	Mature tree < 150 years
7–10	Mature tree ≥ 150 years
> 11	Old tree ≥ 250 years



White Fir

Young or immature trees will have intact canopies, bark fissures less than 2 inches deep, and numerous fine branches less than 1/16" in diameter near the ground.

Mature trees have bark fissures more than 2 inches deep, no fine branches near the ground, and may have multiple tops or extensive mortality in the upper canopy/crown.

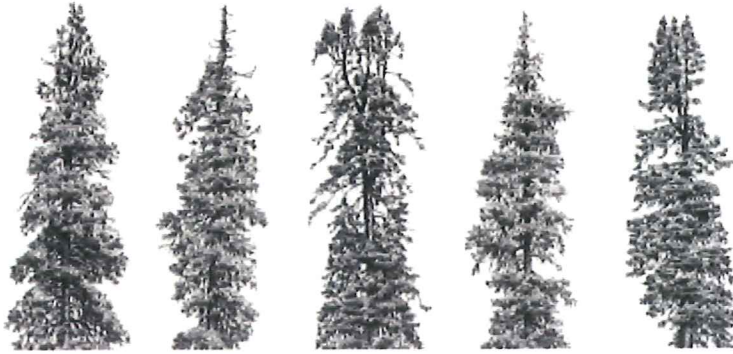
Immature White Fir



Mature (>150 yrs) White fir



Crown Condition of older White Fir Trees



Western Juniper
 Western Juniper Field Guide
 Miller et al. 2007

Characteristics vary across trees so several characteristics may be required to separate young and old.

Characteristics of Western Juniper by Age Class		
Characteristic	Trees <150 years	Trees >150 years
Crown Shape	Conical with pointed tip	Flattened, rounded, or uneven top
Branch Structure	Branches become progressively smaller from bottom to top of tree	In open stands, large branches near the base.
Dead Wood	Little dead wood in the bole, few dead branches, little to no foliose lichen	Dead branches, bark missing, covered by light green lichen.
Bark	Flaky, relatively thin with limited or shallow vertical furrows	Thick fibrous with well-developed vertical furrows.
Leader Growth	Terminal leader growth in the upper ¼ of the tree, usually >2 inches. In open stands, leader growth >2 inches from bottom to top.	Leader growth in the upper ¼ of the tree usually <1 inch.

Photo of young juniper with conical crown, small branches, few dead branches.



Photos of old trees with flattened tops, dead branches, large branches, and lichen.

