

ATTACHMENT B

Stewardship Project Number 001 – Marking of DxPre Units

End result is to retain the *best available trees* to the specified stocking level and/or other *desired condition* as summarized within the DxPre Table.

Within their technical proposal, the contractor shall specify how they will meet the specified stocking level (i.e., marking and cutting plans). The contractor shall mark the entire subdivision. Partial marking of subdivisions shall not be permitted. The contractor shall use non-tracer orange paint purchased by the contractor and approved by the Forest Service to mark designated leave trees. Subdivisions 49, 125, 126, 128, 129, 130, 131, 138, 140, 144, 145, 146, 147, 148, and 149 are Designation by Prescription (DxPre) Units to be marked by the contractor.

Contractor shall propose a color to correct marking when a change is to be made. The color is to be approved by the Forest Service.

Leave-Tree Guidelines:

Abbreviations; TPA (trees per acre), PP (ponderosa pine), WL (western larch), DF (Douglas-fir), WWP (western white pine), WRC (western red cedar) ES (Engelmann spruce), GF (grand fir), WH (western hemlock), AF (alpine fir), LPP (lodgepole pine), QA (quaking aspen), and PB (paper birch).

I. Leave Tree Marking:

- A.** The **stump mark** shall be a minimum size of 6 inches long and 2 inches wide. It shall be placed on the downhill side at the base of every leave tree. Place in crevices if available.
- B.** A horizontal **band** at least 2" wide must encircle the tree between 5 and 7' above the ground.
- C.** Paint marks shall be visible for a distance of at least 100' in all directions until harvest operations are complete.

II. Mark to leave:

- A.** **ALL live trees having a dbh \geq 21.0"**
- B.** **ALL Wildlife Trees having a dbh \geq 14.0"** : Wildlife trees greater than 40% cull due to heart rot, crooks, sweeps, and/or forks, and trees with bird holes, large nests, *live snags* and/or broom rusts. If there are more than 20 wildlife trees per acre, the excess may be removed.
- C.** **ALL WL, PP, or WWP having Most Desirable (D1) characteristics.** Trees with D1 characteristics that do not have any indicator of disease or poor form and are not crowded.
- D.** **To meet the Stocking Level (Item 3, Col. 3), first mark trees defined as Most Desirable (D1) followed by wildlife trees, then Less Desirable (D2).**

D1 Most Desirable Trees/Suitable: Trees that possess the following characteristics shall be the first choice for desirable leave trees:

- a. **Dominant and Co-dominant Preferred Species:** These trees are taller on the average when compared to other trees in the unit. The Preferred Species are in order of preference PP, WL, WWP, DF and WRC. WRC is not a preferred species in areas dominated by PP. When the preferred species does not possess desirable tree characteristics, *vigor/growth* is given preference.
- b. **Health:** With the exception of WL and WWP, foliage shall be dark green in color. The crown shall cover one third or more of the tree all the way around it. A healthy WL will have long straight limbs all the way around the tree for 20% or more of its height. Healthy trees are free of *severe insect or disease problems* and are not stressed.
- c. **Straight Bole:** The bole or stem of the tree shall be relatively straight and have a single terminal leader.

- d. Free of Physical Damage: Trees shall not have physical damage from fire, animals or weather on more than one-fourth of the circumference of the bole or more than three feet of length of the bole.
- e. In addition to above described healthy dominant/co-dominant preferred species, healthy WWP \geq 5" dbh are also Most Desirable Trees.

D2. Less Desirable Leave Trees also Suitable: When the average basal area of most desirable leave trees cannot be achieved with trees that possess the most desirable characteristics, the Contractor shall select trees with less desirable characteristics in the priority listed below:

- a. Minor Defect: Preferred species with minor defect such as a minor crook, a small amount of animal damage, or mistletoe < *Hawksworth rating* 3.
- b. Intermediate preferred species followed by dominant or co-dominant ES, WH, & GF having desirable tree characteristics.
- c. Intermediate non-preferred species (ES, WH, GF, AF, LPP) having desirable tree characteristics. Intermediate trees are approximately $\frac{1}{2}$ the height of dominant/co-dominant trees.
- d. Other Live Trees: Trees other than insect or disease damaged trees with at least 30% live crown and *height to diameter ratio* \leq 1:100.
- f. Forked Trees: Those trees with two or more terminal leaders.
- g. Physical Damage: Trees that have physical damage on less than half the bole circumference and less than three feet in length. Physical damage may be caused by equipment, falling trees, lightning, wind, animals, etc.

III. Vary the Density: The characteristics of available trees shall determine stocking level at most locations.

- A.** In areas with mandatory leave trees (described in section II., A., B., C), the stocking level may be higher than 120 ft²/ac. How high will depend on the number of mandatory leave trees present.
- B.** In areas with Less Desirable Leave trees (D2), the basal area may be lower. The amount of mandatory leave trees will determine how many Less Desirable trees will be marked.
- C.** There may be units where the stocking level will not be achieved due to a lack of suitable leave trees. This is acceptable providing the suitable trees are marked to leave. If no suitable trees exist in an area larger than 3 acres, mark groups of unsuitable trees (12 TPA).
- D.** Suitable trees are those with characteristics described in D1 or D2 above. Unsuitable trees are described in section IV (below).

IV. Do Not Mark leave trees described in A-G below: These are unsuitable trees. However, an exception shall be made for required leave trees (II. A, B, C), logging feasibility (V. A), and 12 TPA when created opening exceeds 3 acres (III. C).

- A.** Dead trees, hardwoods, or trees < 5.0" dbh.
- B.** *Trees not expected to live for 10 years.*
- C.** *Trees with severe insect or disease problems.*
- D.** WL and DF with a *Hawksworth Mistletoe rating of 3 or more.*
- E.** Conifer trees with a poor height to diameter ratio.
- F.** Trees within 50' of *Aspen or Birch clumps.*
- G.** WRC in areas dominated by PP and/or DF (i.e. dry sites).

V. Spatial Pattern of Leave Trees: In general, the Leave Tree Guidelines will determine spatial pattern. However, with the exception of trees having a dbh \geq 21.0", the guidelines may be adjusted when necessary (as described below) for logging feasibility.

- A.** When an unmarked tree cannot reasonably be removed by mechanical equipment without damaging a leave tree.

- B. When trees (described to be marked) have a spatial pattern preventing access to unmarked trees, mark trees in a manner that enables access or removes the need for access. For example, when numerous small diameter suitable trees are less than 18' apart achieve basal area by marking groups of suitable trees rather than the most desirable individual trees.

DxPre Table-

Subdivision No. (Col1)	Acres (Col 2)	Stocking level (Col 3)
49	27	The <i>basal area</i> is expressed as square feet per acre (ft ² /ac). Retain 100 ft²/ac of suitable trees within mesic areas (i.e sites dominated by WRC and/or WH). Retain 80 ft²/ac of suitable trees within dry sites (i.e. sites dominated by DF and/or PP). Do not exceed 120 ft ² /ac at a given location unless II. A, B, or C applies. Where available, leave at least 20 suitable TPA. If created openings exceed 3 acres but lack 20 suitable TPA, leave 12 unsuitable TPA.
125	22	
126	9	
128	15	
129	23	
130	49	
131	68	
138	9	
140	15	
144	37	
145	21	
146	23	
147	31	
148	36	
149	45	
Total acres	430	

Definitions

Basal Area: The cross-sectional (sq ft) area of trees measured at DBH.

Best Available Trees: The best available tree is one with the best vigor, health and/or growth. Given a choice between two trees with equal vigor/health/growth the best available tree is the preferred specie.

Clumps: 3-4 leave trees with crowns within 5' of one another.

Hawksworth Mistletoe Rating: Divide the crown of the tree into 6 sections. Rate each section for presence of mistletoe. The sum of the sections equals the Hawksworth Mistletoe Rating.

Height to Diameter Ratio: The relationship between dbh and height. Trees that are overly tall for their diameter size generally have a poor height to diameter ratio. These trees usually bend over once nearby trees have been removed. A 50' height and 6" dbh is 100:1 ratio.

Severe insect or disease problems: Trees with **mistletoe** in more than half the crown. Brooms, cankers, and swellings on stems and branches are indicators of mistletoe. Mistletoe is common in western larch. Trees showing symptoms of **root disease** should be removed. Frequently, these trees are Douglas fir near root disease centers (an area of dead broken off trees). Indicators of root disease include a white fungus growing between the bark and the wood, resin flow at the base of the tree and/or a lighter color crown with fewer needles, (when compared to other Douglas fir in the area) and fading crowns and/or sap flow from the bole of Douglas-fir and grand fir. **Blister Rust** is common in western white pine. Symptoms of blister rust include heavy resin flow on the

Contract Name: Delaney Stewardship

stem from a diamond shaped wound, dead branches and/or a dead top. Grand fir with **scolytus** scars on both sides of the tree. Numerous pitch tubes where **beetles** have bored into tree. Symptoms of mountain pine beetles are small red to yellowish pitch tubes (less than one-fourth inch) and boring dust in bark crevices and round the base of the tree. Symptoms of Ips beetles are dead tops and group killings without pitch tubes.

Trees not expected to live for 10 years: Trees with red needles, few live branches or other indicators of recent or expected tree mortality.

Vigor/Growth: Relative health and growth of forest trees. Leave-tree preference shall favor trees possessing relatively high vigor/growth, free of disease and defect over trees with relatively poor vigor and growth, regardless of specie preference. For example, a WH with a relatively healthy crown will be favored over and a similarly-sized DF with a faded crown. If the two trees possessed similar vigor/growth characteristics, the DF shall be the preferred leave-tree.