APPENDIX A

TECHNICAL SPECIFICATIONS FOR SERVICE WORK ITEMS

SECTION I – DESCRIPTION OF WORK:

The objective of this project is to increase forest health and vigor and to remove hazardous fuels to reduce the threat of catastrophic wildfire by accomplishing the following:

1. Thin ponderosa pine and mixed conifer stands to acceptable stocking and spacing levels to increase tree vigor, overall stand health, and resilience to insects, disease, and catastrophic wildfire.
2. Reduce hazardous fuels to protect values at risk to wildfire, such as critical transportation routes, public safety, and heavily used recreation sites.
3. Promote conditions where, in the event of wildfire, firefighters will have a favorable operating environment to perform suppression work and members of the local community can safely exit the area.
4. Establish control features along roads and other locations that can be used for containment during a wildfire or prescribed fire.

SECTION II – WORK ITEMS

ALL CUTTING UNIT AND TREATMENT BOUNDARIES

The boundaries of cutting units, or portions of cutting units, are identified as shown on the Cutting Unit Boundary Designation Table below and the Contract Area Map.

Cutting Unit Boundary Designation Table

Marked boundary trees shall not be cut.

Discernable Boundaries are boundary locations that are readily identifiable features on the ground in locations shown on the Contract Area Map.

A Geo-Fence is a location on the ground corresponding to the boundary location shown on a mobile mapping device using a Global Positioning System (GPS) Receiver using the digital vector file/shapefile named **(to be determined)** and dated **(to be determined)**. The digital vector file/shapefile will be provided to the Contractor by the Forest Service. A digital list of the coordinates can be provided upon request.

Included Timber is located within and not past the boundary as shown on the mobile mapping device using the digital vector file/shapefile listed above. Contractor is responsible for obtaining a GPS receiver(s) that is capable of determining the location of the true Geo-Fence within the contract tolerance. Allowable contract tolerance is **40** feet.

Forest Service inspection of cutting Included Timber to determine if cutting is within allowable contract tolerance, shall use the digital vector file/shapefile named and dated above using a GPS Receiver with a minimum, tested accuracy in a **Light-Medium** canopy of **20** feet.

National Technology Development Program GPS Receiver accuracy reports by GPS manufacturer and model are available at: https://www.fs.fed.us/database/gps/mtdcrept/accuracy/index.htm. Forest Service determination of boundary location will be final.

As an operational convenience and subject to written agreement by the Forest Service, in advance of marking, Contractor may mark Geo-Fence boundaries on the ground with Contractor's non-tracer paint. Boundary trees shall not be identified with paint applied below stump height. Contractor shall bear all costs associated with painting used to visually identify boundaries. Forest Service will not approve or accept the boundaries identified on the ground by the Contractor in advance of cutting.

In case of a major disruption in GPS service, or lack of GPS coverage on the Contract Area beyond the control of the Contractor, as determined by the Contracting Officer, extension of time may be granted by Contracting Officer when requested in writing by Contractor in accordance with 52.212-4 (f) Excusable Delays. To resolve major disruption of GPS service, or lack of GPS coverage on the Contract Area, the Forest Service may elect to Mark Geo-Fence boundaries on the ground, in which case the Forest Service's determination of boundary location will be final.

Contractor may request Forest Service Marking of Geo-Fence boundaries on the ground with paint at Contractor's expense. Approval by the Contracting Officer is subject to agreement based on negotiated cost considerations and the availability of Forest Service personnel. If Contractor's request is approved, Forest Service determination of boundary location will be final.

Cutting Unit Boundary Designation Table

Subdivisions	Paint Color	Designation Method	Description
(All Subdivisions)	N/A	Geo-Fence	See description above.
3	Orange	Marked	Where subdivisions share Forest boundary, boundary is painted. Subdivision numbers are on every tag that face the area of cutting.

Mandatory Item 1 and Optional Item 3: Control Features Cut, Skid, and Deck of Conifers

Desired End Results: Stand density and ladder fuels will be reduced, increasing stand resistance to catastrophic high-severity fire, and creating a control feature. Sub-merchantable trees will be removed on either or both sides of identified roads.

Work Item Description for conifers over 8.9 inches DBH:

Within Subdivision(s) or cutting unit(s) **ALL,** as shown on Contract Area Map measured 250 ft from road edge, the following criteria shall be used by Contractor to designate trees and other products for cutting and removal.

(a) **Trees as described in Appendix A for cut and deck services may be added as Timber Subject to Agreement.**

(b) Additional trees to be cut, if any, are Marked by Forest Service with **green** tracer paint.

(c) Cutting unit boundaries and other trees that shall be left uncut are Marked by Forest Service with **orange** tracer paint.

Contractor may select cut trees in cutting units **(All Subdivisions)** without pre-harvest marking in accordance with the criteria in (a).

Definitions:

Aspen Clump: At least 5 healthy (white bark with little to no evidence of disease or damage) live aspen trees at least 5 feet tall. Trees are members of the same clump if they are within 25 feet of at least one other tree in the clump.
Clump: a grouping of 2 or more merchantable trees with interacting crowns. Trees are members of the same clump if they are within 20 feet (measured face-to-face) of at least one other tree in the clump.
Individual Tree: A tree that has no other merchantable tree within 20 feet of its bole.
Mature Tree: A tree classified as greater than 150 years of age as determined using Robert Van Pelt's guide. See figures below.
Codominant/Dominant Tree: Trees that form, or extend above, the general level of the main canopy (from the Dictionary of Forestry, Society of America Foresters).
Competing Tree: Trees that saps critical resources from more desirable trees.
Diameter at Stump Height (DSH): Diameter of a tree measured perpendicular to the stem outside of the bark at 4 inches on the uphill side of the tree.
Diameter at Breast Height (DBH): Diameter of a tree measured at 4.5 feet above the ground on the uphill side of the tree.
Drip Line: The dripline of a tree is defined as the area located directly under the outer circumference of its branches.
Healthy Tree: live tree with little evidence of insects or disease (Dwarf Mistletoe Rating less than 3, few to no insect pitch tubes), with full crowns (at least 30% live crown ratio) and healthy foliage (not thinning or yellowing). Tree is vigorous, meaning the tree is growing, as can be seen by pointy tops and observable internodes.
• See Dwarf Mistletoe Rating diagram (Figure 4).
Unhealthy Tree: An unhealthy tree will generally have some combination of the following characteristics: small crown (less than 30 percent crown ratio), dead top, multiple dead branches in the crown, sparse crown (reduced needle retention giving a tufted appearance), fading coloration of the crown, dwarf mistletoe in upper and middle thirds of the crown, multiple pitch tubes and/or large patches of missing bark.

Suppressed Tree: A tree whose crown is completely overtopped by the crowns of one or more neighboring trees (Dictionary of Forestry, Society of American Foresters). Suppressed trees often have a low crown ratio (less than 30 percent).

Distances are measured slope distance to face of the tree at DSH.
All live conifer trees within the subdivision, including boundary trees, greater than or equal to minimum DBH in A.2 count towards residual stocking.

End Result: Reduce conifer encroachment, competition, stand density, and ladder-fuels to increase forest stand health and resistance to catastrophic high-severity fire. After treatment these areas will have an average stand density of **50 ft^2** per acre of basal area and increased variability in the structure and spatial arrangement of the residual trees in the form of individual trees, clumps, openings, and retention patches. The residual area will have an increase in its mean diameter, a reduction in ladder fuels, as well as a shift in composition and structure towards mature fire-adapted conifers.

A basal area factor of 10 will be used to determine stocking compliance.

Residual Stocking Objectives - Perform these in order; subsequent items do not override any item preceding it:

1. Retain all Mature trees, hardwoods, and trees equal to and greater than 21.0” DBH, as well as all other trees greater than or equal to 26.0” DSH. (See 3. For exception on White fir, under Tree Selection Objectives).
2. Retain species in order of preference. Ponderosa Pine, White fir, Lodgepole Pine. Do not cut any incense cedar or 5-needled pine (if present).
3. Do not cut Ponderosa or Lodgepole Pine with 26.0“ DSH or greater.

Tree Selection Objectives:

1. Thin throughout the diameter range to a target residual basal area of 50 ft^2, with an acceptable range of 40-60 ft^2 Leaving trees with the greatest health and vigor.
2. Remove all competitive trees within two driplines (crown width x 2) of Ponderosa Pines with DSH of 26.0” or greater.
3. Remove **WF** species regardless of diameter from within two driplines of Ponderosa Pine trees 26”.0+ DSH.

Examples of when the lower BA range is applicable:

- Areas where trees have poor health and vigor with active insects and disease.
- Areas where residual mature trees over 26.0 inches DSH are surrounded by white fir or lodgepole pine.
- Release of deciduous trees (described below)

Examples of when the higher basal area range is applicable:

- Clumps of healthy ponderosa pine up to 140 sqft of basal area per acre for spatial diversity (approximately 1 clump for every 2 acres if available (average distance 400ft between clumps).

- Areas where residual ponderosa pine, and/or five needled pine are over 26.0 inches DSH and contribute to higher average BA.

CUTTING, YARDING/SKIDDING, EROSION CONTROL, DECKING AND SLASH SPECIFICATIONS

Felling shall be done to minimize breakage of conifers and damage to residual timber. Unless agreed otherwise, felling shall be done by saws or shears. Bucking shall be done to permit removal of all minimum pieces. Contractor may buck out cull material when necessary to produce pieces meeting Utilization Standards. Such bucked out material shall contain a minimum amount of sound wood, not in excess of the net scale in percentage of gross scale, or based on the merchantability factor, whichever is stated in the Utlization Standard table located in Decking Specifications. If necessary to assess the extent of defect, Contractor shall make sample saw cuts or wedges.

Felling objectives shall be accomplished by the type of felling methods and equipment listed herein. Methods or equipment other than those specified may be approved. For Subdivisions shown in the following table, Contractor shall submit a cutting plan for Forest Service acceptance, prior to the start of felling operations.

See attached table.

SPECIFIC REQUIREMENTS

FELLING METHODS	SUBDIVISIONS
Ground-based equipment will be limited to slopes less than 35%	ALL
Leave a minimum stump height of 4 inches on the high side of the stump.	ALL
Cutting lanes to be used should average 40 feet apart.	ALL
All harvest equipment shall maintain 100 feet or greater spacing of primary skid trails, except when converging to a landing. Skid trail width shall not exceed 14 feet.	ALL
Within Riparian Habitat Conservation Areas, as shown on Contract Area Map, trees may be hand-felled or can be removed with an extending boom to facilitate harvest, provided no tracking of equipment enters these zones	ALL
Ground-based equipment shall be limited to slopes less than 35%. Short pitches (defined up to 200’) of 35%-50% slope is allowed, but will not exceed 10% of the treatment area	ALL

Stumps shall not exceed, on the side adjacent to the highest ground, the maximum heights set forth in the table below, except that occasional stumps of greater heights are acceptable when Contractor determines that they are necessary for safe and efficient conduct of logging. Unless otherwise agreed, Contractor shall re-cut high stumps so they will not exceed heights specified in Division A6 and shall dispose of severed portions in the same manner as other logging debris. The stump heights shown in Division A6 were selected with the objective of maximum reasonable utilization of the timber, unless Contract Area Map shows special areas where stump heights are lower for aesthetic, land treatment, or silvicultural reasons.

Species	**Product**	**Maximum Stump Height** ***(inches)***
ALL	ALL	12

YARDING/SKIDDING REQUIREMENTS

Contractor shall submit for Forest Service approval a Yarding/Skidding Plan prior to the start of felling operations. Requirements other than those specified in the following table may be approved. When appropriate, Location of all skid roads and trails, tractor roads, skyline corridors, mechanized harvester trails, forwarder roads, and other log skidding facilities, shall be approved prior to their use or construction.

See attached table for requirements.

YARDING/SKIDDING REQUIREMENTS

YARDING/SKIDDING REQUIREMENTS	SUBDIVISIONS
All trees shall be yarded to the landing with the top attached to the last log. All limbing must be done on the landing area.	ALL
One end suspension required	ALL
Mechanical yarding and skidding, as well as, skidding equipment shall operate in a manner which will minimize detrimental soil disturbance to less than 20% of the subdivision area.	ALL
Ground-based equipment shall be limited to slopes less than 35%. Short pitches (defined up to 200') of 35%-50% slope is allowed, but will not exceed 10% of the treatment area	ALL

EROSION CONTROL AND SOIL TREATMENT BY CONTRACTOR

Erosion prevention and control work shall be completed within 15 calendar days after yarding/skidding operations related to each landing are substantially completed or after Forest Service designation on the ground of work where such designation is required hereunder. Said time limit shall be exclusive of full days lost in Contractor's Operations due to causes beyond Contractor's control. Such on the ground designation shall be done as promptly as feasible unless it is agreed that the location of such work can be established without marking on the ground. After September 15, and as long thereafter as operations continue, the work shall be done as promptly as practicable. Damage resulting from Contractor's Operations due to failure to perform required work shall be repaired by Contractor.

On slopes greater than N/A percent, erosion control measures will be done with methods other than mechanized equipment, unless otherwise agreed.

Utilization Standards:

				Minimum Specifications				
				Merchantable Tree		**Piece Required to be Removed**		
Species Group	**Product**	**Estimated Quantity***	**Unit of Measure**	**Diameter Breast High (DBH)** *(inches)*	**Number of Minimum Pieces per Tree**	**Length** *(feet)*	**Diameter Inside Bark at Small End** *(inches)*	**Net Scale in % Gross Scale** 1/
Timber Subject to Agreement								
Combined Softwood	Green Bio CV	Unestimated	Ton	N/A	N/A	N/A	N/A	N/A
White-fir and Other Coniferous Species	Sawtimber	Estimated	Ton	7.0	1	8	6.0	40
Ponderosa Pine	Sawtimber	Estimated	Ton	9.0	1	16	6.0	40
Total Quantity		16,248						

1/ Enter Merchantability Factor (Merch. Factor) or Net Scale in % of Gross Scale, whichever is appropriate.

Slash treatment specifications:

Whole-tree yard cut trees to approved landing locations. Machine pile all cut trees and slash at three feet in diameter and three feet in length.

SLASH DISPOSAL

As used in the following Subsections, the term "slash" is vegetative debris including, but not limited to, cull logs, blasted or pushed-out stumps, chunks, broken tops, limbs, branches, rotten wood, damaged brush, damaged or destroyed reproduction, saplings or poles, resulting from Contractor's Operations, including construction of roads or other improvements under this contract.

Any burning of slash or refuse by Contractor is N/A.

Forest Service may agree to substitute methods of slash disposal if such substitute methods will give equally satisfactory results.

Forest Service may waive specific slash treatment requirements of the Contractor. Contractor's Integrated Resource Account will be charged for any slash treatment requirements waived. The amount of such charges will be determined by Forest Service prior to felling operations in each Subdivision.

(Option 2) SLASH TREATMENT REQUIREMENTS

Contractor shall pile, burn, yard, construct firelines or otherwise treat slash defined above, within designated areas. Work required of Contractor shall be in accordance with the following slash plan and specifications, and the Contract Area Map.
Unless otherwise agreed, or shown in the attached slash plan or specifications.

See following specifications.

SLASH TREATMENT REQUIREMENTS (OPTION 2)

I. General Specifications

The slash treatment method for each Subdivision is to be accomplished by the Contractor in accordance with specifications listed herein.
Landings area slash will be prepared for burning by machine piling unless substitute methods are permitted by the Forest Service prior to commencing work.

II. Detailed Specifications

a. Landing Area Slash
   i. Machine pile all cut trees and slash that is at least three inches diameter, and three feet in length, on the cleared landing. Machine pile any slash pushed up along the edge or off the landing during skidding and decking operations.
   ii. Landings shall be located along existing or temporary roads, for Forest Service access. No piles shall be made within the Subdivision not accessible by road.
   iii. Unless otherwise agreed, slash piles shall be located at least 75 feet from the bole. Piles will be a minimum of 8 feet in height and 12 feet in diameter, where practicable and as compact as possible. Piles shall be reasonably free of dirt and rocks.

iv. Do not include stumps from landing construction, or any other stumps in the landing and decking area. Yard stumps back into the unit to locations approved by the Forest Service.
v. All material extending beyond the general contour of the piled slash shall be trimmed off and added to the pile.

b. Construct a fireline to mineral soil around piles 8 feet wide, down to bare mineral soil.
c. Equipment used by the Contractor to pile landing slash is included in this technical proposal.

<u>Work Item Description for conifers under 8.9 inches DBH</u>:

In areas with residual merchantable trees, cut all live ponderosa pine 3 feet in height up to 8.9-inches DBH, cut all live coniferous species 3 feet in height up to 6.9 inches DBH within **250 feet** of the road, measured from the road edge, as shown on Contract Area Map (CAM). In areas with no residual merchantable trees, thin cut trees to a variable spacing ranging from 25 by 25 to 45 by 45 feet, with an average spacing of 30' x 30'.

<u>Additional Specifications:</u>

1. Do not cut 5 needle pine.
2. Species preference in order from highest to least desirability: ponderosa pine, incense cedar, white fir, and lodgepole pine.
3. Leave trees should be the largest, healthiest trees in the area.
4. Cut trees shall be selected from thinning from below so that the residual stand will be compromised by fire tolerant species and the healthiest trees.
5. All juniper 2-inch DBH and above and less than 21-inch DBH in uplands, and 26-inch DBH in riparian (RHCA) areas that do not exhibit old growth characteristics. If any questions on determination of old growth occur, the COR will make the final decision.

Cut trees shall be completely severed from the stump after felling. Stump height shall not exceed six (6) inches above ground level, or four (4) inches above natural obstacles, such as large rocks

*Do not cut Whitebark Pine. All WBP will be flagged with neon glow and white with blue polka dot flagging by FS prior to contract Notice to Proceed.

<u>In areas where feature overlaps plantations, follow the specifications listed below:</u>
Cut live ponderosa pine 3 feet in height up to 8.9-inches DBH, cut live coniferous species 3 feet in height up to 6.9 inches DBH within **250 feet** of the road, measured from the road edge, as shown on Contract Area Map (CAM). Thin cut trees to a variable spacing ranging from 25 by 25 to 45 by 45 feet, with an average spacing of 30' x 30'.

<u>Additional Specifications:</u>

1. Do not cut 5 needle pine.
2. Species preference in order from highest to least desirability: ponderosa pine, white fir, and lodgepole pine. If species are the same, preference will be given to the healthiest tree.
3. Leave trees should be the largest, healthiest trees in the area.

Slash treatment specifications:

General Specifications

The slash treatment method is to be accomplished by the Contractor in accordance with specifications listed herein.

Landings area slash will be prepared for burning by machine piling unless substitute methods are permitted by the Forest Service prior to commencing work.

Detailed Specifications

d. Landing Area Slash
   i. All cut trees at least three inches in diameter, and three feet in length shall be treated as slash and piled for disposal and/or burning on the cleared landing locations. Machine pile any slash pushed up along the edge or off the landing during skidding and decking operations.
   ii. Landings shall be located along existing or temporary roads, for Forest Service access.
   iii. Unless otherwise agreed, slash piles shall be located at least 40 feet from the bole of any live tree. Piles will be a minimum of 8 feet in height and 12 feet in diameter, where practicable and as compact as possible. Piles shall be reasonably free of dirt and rocks.
   iv. Do not include stumps from landing construction, or any other stumps in the landing and decking area. Yard stumps back into the unit to locations approved by the Forest Service.
   v. All material extending beyond the general contour of the piled slash shall be trimmed off and added to the pile.

e. Equipment for Piling Landings
   i. Construct a fireline down to bare mineral soil around piles 8 feet wide.
   ii. Equipment used by the Contractor to pile landing slash is included in this technical proposal.

Mandatory Item 2: Control Features Cut, Skid, and Deck of Conifers within Old Growth

Desired End Results: Stand density and ladder fuels will be reduced, increasing stand health and resistance to catastrophic high-severity fire.

Work Item Description for conifers over 8.9 inches DBH:

Within Subdivision(s) or cutting unit(s) **ALL,** as shown on Contract Area Map, the following criteria shall be used by Contractor to designate trees and other products for cutting and removal.

(a) **Trees as described in Appendix A for cut and deck services may be added as Timber Subject to Agreement.**

(b) Additional trees to be cut, if any, are Marked by Forest Service with **green** tracer paint.

(c) Cutting unit boundaries and other trees that shall be left uncut are Marked by Forest Service with **orange** tracer paint.

Contractor may select cut trees in cutting units **(All Subdivisions)** without pre-harvest marking in accordance with the criteria in (a).

Definitions:

Aspen Clump: At least 5 healthy (white bark with little to no evidence of disease or damage) live aspen trees at least 5 feet tall. Trees are members of the same clump if they are within 25 feet of at least one other tree in the clump.
Clump: a grouping of 2 or more merchantable trees with interacting crowns. Trees are members of the same clump if they are within 20 feet (measured face-to-face) of at least one other tree in the clump.
Individual Tree: A tree that has no other merchantable tree within 20 feet of its bole.
Mature Tree: A tree classified as greater than 150 years of age as determined using Robert Van Pelt's guide. See figures below.
Codominant/Dominant Tree: Trees that form, or extend above, the general level of the main canopy (from the Dictionary of Forestry, Society of America Foresters).
Competing Tree: Trees that saps critical resources from more desirable trees.
Diameter at Stump Height (DSH): Diameter of a tree measured perpendicular to the stem outside of the bark at 4 inches on the uphill side of the tree.
Diameter at Breast Height (DBH): Diameter of a tree measured at 4.5 feet above the ground on the uphill side of the tree.
Drip Line: The dripline of a tree is defined as the area located directly under the outer circumference of its branches.
Healthy Tree: live tree with little evidence of insects or disease (Dwarf Mistletoe Rating less than 3, few to no insect pitch tubes), with full crowns (at least 30% live crown ratio) and healthy foliage (not thinning or yellowing). Tree is vigorous, meaning the tree is growing, as can be seen by pointy tops and observable internodes.
• See Dwarf Mistletoe Rating diagram (Figure 4).
Unhealthy Tree: An unhealthy tree will generally have some combination of the following characteristics: small crown (less than 30 percent crown ratio), dead top, multiple dead branches in the crown, sparse crown (reduced needle retention giving a tufted appearance), fading coloration of the crown, dwarf mistletoe in upper and middle thirds of the crown, multiple pitch tubes and/or large patches of missing bark.
Suppressed Tree: A tree whose crown is completely overtopped by the crowns of one or more neighboring trees (Dictionary of Forestry, Society of American Foresters). Suppressed trees often have a low crown ratio (less than 30 percent).

Distances are measured slope distance to face of the tree at DSH.
All live conifer trees within the subdivision, including boundary trees, greater than or equal to minimum DBH in A.2 count towards residual stocking.

End Result: Reduce conifer encroachment, competition, stand density, and ladder-fuels to increase

forest stand health and resistance to catastrophic high-severity fire. After treatment these areas will have an average stand density of **50 ft²** per acre of basal area and increased variability in the structure and spatial arrangement of the residual trees in the form of individual trees, clumps, openings, and retention patches. The residual area will have an increase in its mean diameter, a reduction in ladder fuels, as well as a shift in composition and structure towards mature fire-adapted conifers.

A basal area factor of 10 will be used to determine stocking compliance.

Residual Stocking Objectives - Perform these in order; subsequent items do not override any item preceding it:

4. Retain all Mature trees, hardwoods, and trees equal to and greater than 12.0" DBH.
5. Retain species in order of preference. Ponderosa Pine, White fir, Lodgepole Pine. Do not cut any incense cedar or 5-needled pine (if present).

Tree Selection Objectives:

4. Thin throughout the diameter range to a target residual basal area of 50 ft^2, with an acceptable range of 40-60 ft^2 Leaving trees with the greatest health and vigor.

<u>Deciduous Tree Release:</u>

- Aspen – (5 or more stems within 20 feet)

Remove all conifers less than 13" within 100' from last stem and cut to 20 BA (or as low as possible if mature pine species are present) up to 200'

- Mtn. mahogany – (3 stems within 60 feet)

Remove all conifers less than 13" within 60' and cut to 20 BA (or as low as possible if mature pine species are present) up to 200 feet from last mountain mahogany stem. Cut all juniper under 21" within 200 feet.

CUTTING, YARDING/SKIDDING, EROSION CONTROL, DECKING AND SLASH SPECIFICATIONS

Specifications for Mandatory Item 1 and Optional Item 3 apply.

<u>Work Item Description for conifers under 8.9 inches DBH</u>:

Within areas identified as Old Growth on CAM, cut live ponderosa pine 3 feet in height up to 8.9-inches DBH, cut live coniferous species 3 feet in height up to 6.9 inches DBH to an average spacing of 30' x 30'. An acceptable range of 16-40 feet, where the lower range would be used is in small openings or in areas with lower canopy cover, in which desirable species are present (ponderosa pine, western white pine, sugar pine, and white bark pine). The wider spacing range would be used under closed canopy conditions in which a select few shade tolerant species would be retained.

<u>Additional Specifications:</u>

1. Do not cut 5 needle pine
2. Species preference from highest to least desirability: ponderosa pine, incense cedar, western white pine, sugar pine, white fir, and lodgepole pine.
3. Retain down woody debris greater than 8.0-inch DBH.

Slash treatment specifications:

General Specifications

The slash treatment method is to be accomplished by the Contractor in accordance with specifications listed herein.

Landings area slash will be prepared for burning by machine piling unless substitute methods are permitted by the Forest Service prior to commencing work.

Detailed Specifications

f. Landing Area Slash
   i. All cut trees at least three feet in height and three feet in length shall be treated as slash and piled for disposal and/or burning on the cleared landing locations. Machine pile any slash pushed up along the edge or off the landing during skidding and decking operations.
   ii. Landings shall be located along existing or temporary roads, for Forest Service access.
   iii. Unless otherwise agreed, slash piles shall be located at least 40 feet from the bole of any live tree. Piles will be a minimum of 8 feet in height and 12 feet in diameter, where practicable and as compact as possible. Piles shall be reasonably free of dirt and rocks.
   iv. Do not include stumps from landing construction, or any other stumps in the landing and decking area. Yard stumps back into the unit to locations approved by the Forest Service.
   v. All material extending beyond the general contour of the piled slash shall be trimmed off and added to the pile.

g. Equipment for Piling Landings
   i. Construct a fireline down to bare mineral soil around piles 8 feet wide.
   ii. Equipment used by the Contractor to pile landing slash is included in this technical proposal.

Optional Item 4: Grapple Pile

All subdivisions

End Results: Existing slash and down woody debris will be piled for future burning or removal activities. This will result in a fuels load reduction to slow the spread of a wildfire.

Work Item Description: Machine pile all slash and down wood debris at least 3 inch in diameter on the small end and at least 3 feet in length. Piles shall be as compact as possible and free of soil and rocks. Locate piles at landing locations adjacent to the road, not within subdivisions. Piles will be constructed with a “lift and pile” mechanism rather than a “push and pile” mechanism. Unless otherwise agreed, slash piles shall be located at least 40 feet from the crown, or drip line of any live tree. Where possible combine Grapple piles with piles generated as a result of other work items. Piles will be a minimum of 8 feet in height and 12 feet in diameter, where practicable and as compact as possible. Trim all material extending beyond the general contour of the pile and add all trimmings to the pile.

Optional Item 5: Remove Timber Subject to Agreement

*TSA will be removed as a non pay item

Remove from Contract Area all trees and forest products which meet the minimum tree specifications as identified in Appendix B. All specifications of Appendix B apply to product removal. Appendix C Road Maintenance requirements are commensurate with use.

SECTION III – CONTROL OF WORK

The Contractor agrees to conduct its operations under this contract and other related business activities in compliance with Federal, State, and local statutes, standards, orders, permits and other regulations.

The Contractor shall meet all State and local environmental quality laws applicable to National Forest system lands.

It is incumbent upon the contractor to ensure areas for protection are identified in the project area and are protected throughout implementation. Work shall follow all protection measures needed for plants, animals, cultural resources, and cave resources as outlined in the solicitation.

Work may be done any time during the term of the contract, except under the following conditions:

(1) When conditions are such that operations shall be restricted or ceased due to increased fire risk.

(2) When seasonal operating restrictions for active raptor nests, winter range, or High Use Migration are in effect. All active nest sites and areas of restriction are shown on CAM and listed in the solicitation under Protection Measures Needed for Plants, Animals, Cultural Resources, and Cave Resources. Restrictions would apply:

(3) If new nests are discovered,

(4) When soil moisture conditions create excessive risk of damage to the soil,

(5) When snow depth creates a situation where requirements cannot be met and/or work cannot be inspected, as determined by the COR.

(6) The government reserves the right to prioritize the order in which Units are treated.

(7) If any cultural or archeological sites are discovered during operations of this contract, work will be suspended in the immediate vicinity of the site until a reconnaissance survey is completed by the Forest Archeologist. Areas excluded from treatment shall be deleted from the contract.

SECTION IV – INSPECTION AND ACCEPTANCE

For All Work Items:
At any point during the project, the Contractor and/or Project Manager may request (documented through email, text, or hand-written request) consultation with the Forest Service to inspect work progress, review contract specifications, or clarify issues. The Forest Service shall respond to Contractor's request within 7 calendar days, excluding weekends and federal holidays.

Contractor and Forest Service shall establish and agree to check-in procedures at the post-award conference meeting. At minimum, weekly progress report updates, meetings, and/or providing draft unit plans for Forest Service inspection, shall be required. Forest Service acceptance of draft submittals may be incorporated into final plans without further inspection by the Forest Service if no alterations are made.

GOVERNMENT QUALITY ASSURANCE SURVEILLANCE PLAN

Quality assurance will be performed by the Government during the contract at regular intervals. Methods may include visual survey and review of contractor quality control documents. Unacceptable work shall require rework at no cost to the Government. All work shall meet all the standards listed in above sections.

Government Inspection Procedures –

The COR, or a designated inspector (Government Technical Monitor or Timber Sale Administrator), will make periodic inspections while work is in progress, usually daily at first, as needed to assure work is proceeding satisfactorily. The Contractor shall notify the COR when deliverables and units are started, when problems are encountered and when contract work needs government oversight.

1. Each work item and unit will be inspected as a separate unit. Units will not be averaged with other units for acceptance or payment.

2. When work items and units are completed and ready for government inspection, Contractor's designated Project manager shall request unit inspection in writing, prior to moving out of the general area.

3. The COR, or designated inspector, will determine compliance with contract specifications through informal visual inspections. In the event visual inspection indicates work to be in non-compliance with specifications, prompt corrective action and/or rework shall be required.

Formal Government Inspection Procedures – Item 1, 2 and 3

ACCEPTANCE OF WORK

Upon Contractor's written request and assurance that cutting within Subdivision(s) or cutting unit(s) has been completed in accordance with specifications for Items 1, 2 and 3, the Forest Service shall perform an inspection within 5 days, excluding weekends and federal holidays, so as not to unnecessarily delay

progress of Contractor's operations. Unless otherwise agreed in writing, procedures to be completed by the Forest Service for inspecting Contractor cutting are listed below. Once cutting in a Subdivision(s) or cutting unit(s) is completed and accepted by Forest Service, no additional trees shall be cut by Contractor without prior authorization from Forest Service.

See attached table.

Subdivision(s)	Inspection Method(s)
ALL	The COR, or designated inspector, will determine compliance with contract specifications through informal visual inspections. In the event visual inspection indicates work to be in non-compliance with specifications, prompt corrective action and/or rework shall be required. In the event formal inspection is needed, inspection of Contractor cutting will be done by variable plot (point sampling), with at least one plot per ten acres. Each subdivision will have at least three plots. Plot locations will be random and determined by a non-biased method. A basal area factor of 10 will be used to evaluate the basal area ranges and targets contained in the DxP specifications. Each subdivision will be evaluated and approved separately. In addition to inspecting the basal area of leave trees, the inspection will also evaluate compliance with prescription requirements pertaining to selection of species, quality of leave trees, and spacing or juxtaposition standards for these subdivisions.

All general sale inspection methodology will follow the Pacific Northwest Timber Product Accountability Action Plan and the 2022 Fremont-Winema Timber Accountability Action Plan unless otherwise agreed to by the Forest Service.

<u>Formal Government Inspection Procedures – Formal (Plots) Item 4</u>

1. In the event visual inspection indicates work and/or rework to be in non-compliance with contract specifications, a series of verification plots shall be installed by the Government to determine compliance with specifications and percent of satisfactory work for treatment of each unit not meeting specification as observed with visual inspection.
2. Government verification plots will consist of a series of fixed area plots that will have 4 quadrants of pass or fail.

3. Plots and grid will be distributed so that a representative sample is obtained. Pile locations including landings may be sampled in plots to determine overall quality.

4. The COR or designated inspector will mark the center of each plot on the ground using flagging, stakes, or pin flags. Additional flagging will be hung near the plot center so that it may be seen from a distance. The inspector will include the plot number, their initials and date on the flagging.

5. Plots will be numbered to correlate with the inspection form and transects on a unit map.

6. The minimum number of verification plots, per treatment unit, shall be as follows:

Unit Acreage	**Minimum No. of Plots**
1 – 9	1 plot per 2 acres
10 – 29	10 plots
30 – 59	1 plot per 4 acres
60 – 99	20 plots
100	1 plot per 5 acres

7. Determination of acceptability of the work performed will be based on Government verification inspections and will be considered conclusive.

Reinspection Upon Contractor Request

1. If Government inspection results are unacceptable to the Contractor, a reinspection may be requested, in writing, within 5 business days after receipt of notice of said inspection results. The same inspection procedure will be used; however, the inspection pattern will be shifted so that new inspection plots will not overlap previously inspected plots.

2. If reinspection results – rounded up to the nearest whole percent – indicate a variance of more than 5 percent from the first inspection, the results of the second inspection will be used to calculate work quality and payment, and the Government will bear the cost of reinspection.

3. If reinspection results – rounded up to the nearest whole percent – are within 5 percent of the first inspection, plots from the initial inspection and the reinspection will be combined and used to calculate work quality and payment, and the Contractor shall bear the cost of reinspection.

Table 1 – Minimum Acceptable Quality Levels (AQL) of Work

ITEM	DESCRIPTION	SCHEDULE	UNIT	Min AQL
1	Control Feature Cut, Skid, and Deck of Non-sawtimber	MANDATORY	Acre	90%
2	Control Feature Cut, Skid, and Deck of Non-sawtimber within Old Growth Units	MANDATORY	Acre	90%
3	Control Feature Cut, Skid, and Deck of Non-sawtimber	OPTIONAL	Acre	90%
4	Grapple Pile	OPTIONAL	Acre	90%

5	Remove Timber Subject to Agreement	OPTIONAL	Tons	N/A

Unsatisfactory Performance

1. If the work quality falls below the minimum AQL, the COR will immediately notify the Contractor, in writing, and order him to improve the quality of subsequent work.
2. If after rework has been performed and reinspected, and work quality still falls below minimum AQL percent, payment will either be made at a reduced rate, or not at all, as determined in SECTION VI below.
3. Repeated failure to produce work quality at or above the minimum acceptable standard will be considered reason for contract termination for cause.

SECTION V – PAYMENT METHODS

Method of Measurement for Acreages

Acreages and miles were determined by using Global Positioning Systems (GPS) or digitized using GIS mapping. Some
unit boundaries are flagged or painted, but the majority of boundaries are virtual.
Discernable Boundaries are boundary locations that are readily identifiable features on the ground in locations shown on
the Contract Area Map. A Geo-Fence is a location on the ground corresponding to the boundary location shown on a
mobile mapping device using a Global Positioning System (GPS) Receiver using a digital vector file/shapefile. The digital
vector file/shapefile will be provided as an attachment to the Contractor by the Forest Service. A digital list of the
coordinates can be provided upon request.

Contractor is responsible for obtaining a GPS receiver(s) that is capable of determining the location of the geo-fence
boundary within the contract tolerance. Allowable contract tolerance is 40 feet.
Forest Service inspection of treatment boundaries shall be conducted to determine treatments are within the allowable
contract tolerance using the digital vector file/shapefile referenced above using a GPS Receiver with a minimum, tested
accuracy in a Light- Medium canopy of 20 feet.

National Technology Development Program GPS Receiver accuracy reports by GPS manufacturer and model are
available at: https://www.fs.usda.gov/database/gps/mtdcrept/accuracy/index.htm. Forest Service determination of
boundary location will be final.

In case of a major disruption in GPS service, or lack of GPS coverage on the Contract Area beyond the control of the
Contractor, as determined by the Contracting Officer, extension of time may be granted by Contracting Officer when
requested in writing by Contractor in accordance with 52.212-4 (f) Excusable Delays. To resolve major disruption of GPS
service, or lack of GPS coverage on the Contract Area, the Forest Service may elect to Mark Geo-Fence boundaries on the
ground, in which case the Forest Service's determination of boundary location will be final.

The acreage for each work item will be rounded to the nearest acre and miles will be rounded to the nearest hundredth of a
mile. Acreage and milage is final unless:
a. The contract is modified or,
b. The Government makes a determination to remeasure or,
c. The Contractor exercises his/her option under the following Remeasurement provisions

Remeasurement

1. The FS may conduct remeasurement of any units under this contract if FS feels that acreage stated on the project maps is incorrect. The remeasurement must be within the existing perimeter of the respective unit as laid out by contractor. No variance of the unit perimeters as laid out on the ground for this contract will be allowed. Remeasurement will be performed by the Government.
2. If remeasurement indicates that a variance of ten percent or less exists on units of 1 to 5 acres, five percent or less exists on units of more than five but less than 20 acres, or if three percent or less exists on units of 20 acres or larger, the Contractor shall pay for the actual costs of the remeasurement. Under this condition, payment will be made on the acreage stated on the project maps. If the remeasurement indicates the actual acreage varies by more than the above factors from that stated on the project maps, the payment will be made on the remeasured acreage and the contractor will pay for the cost of the remeasurement.

Acceptance and Payment

1. Percentages as calculated herein shall be rounded to the nearest whole percent.
2. No allowance for variation or portion of a variation will be added which will create a percentage greater than 100 percent.

Acceptance and Payment – Items 1, 2, and 3, 4

1. If informal visual inspection indicates acceptable work quality, the Contractor will be paid 100 percent of their bid rate.
2. In the event that formal inspections are used, the rate of payment to the Contractor will be

calculated as follows:

(a) For work quality of 90 percent or higher, the Contractor will be paid 100 percent of their bid rate.

(b) For work quality from 85 to 89 percent that cannot be reworked, the Contractor will be paid the total work quality percentage multiplied by the bid rate.

(c) For work quality 84 percent and less that cannot be reworked, no payment made to the Contractor.

(d) If, after rework, the percentage of satisfactory work is between 85% and 89%, payment will be made by the actual percentage. If the percentage is less than 85%, the work is unacceptable, and no payment will be made.

SECTION VI – DEFINITIONS

ACCEPTABLE QUALITY LEVEL (AQL): Acceptance of work will be based on compliance with all specifications corresponding to the appropriate task(s); refer to the Performance Requirements Summary in Section E.4 of the contract. A minimum AQL is required for all service work – hand or mechanical. The minimum AQL will receive a satisfactory performance rating.

BOLE SPACING: The horizontal distance in feet from the edge of one leave tree bole to another leave tree bole, measured from the outside bark of each tree.

CIRCULAR PLOT: A sample plot within a thinning unit that is used to determine the number of desirable trees and other contract specifications.

COARSE WOODY DEBRIS: Woody material left on the ground to meet wildlife habitat requirements.

CROWN RATIO: The ratio of live crown length (tip of leader to base of the crown) to total tree length/height.

CROWN SPACING: The horizontal distance in feet between the dripline of a live crown to another live crown.

CLEARCUT: A cutting prescription in which all trees within a boundary are designated to be cut.

CROWN RATIO: The ratio of live crown length (tip of leader to base of the crown) to total tree length/height.

CROWN SPACING: The horizontal distance in feet between the dripline of a live crown to another live crown.

CUT TREES: Trees that do not possess the characteristics of desirable leave trees and are required to be cut. As described by the contract or otherwise marked to be cut.

CUTTING UNIT: See Treatment Unit definition

DAMAGED TREES: Trees damaged beyond recovery. A tree that is larger than 2 feet in height, and has the top knocked out, is leaning more than 10 degrees, has less than one half of its original limbs, or has approximately 50% of bark removed from the circumference of the bole.

DBH: Diameter at breast height, measured at a point of 4.5 feet above the ground level on the uphill side of the tree.

DECKING: Stockpiling of trees in a designated area.

DEAD/DYING TREES: Trees with the crown foliage changing from green to red, yellow, or needleless. Any tree that has pitch tubes indicating Mountain Pine Beetle infestation.

DESIGNATION BY SPECIES AND DIAMETER (DXSD): A cutting prescription in which species and diameter are used to determine which trees will be left and which will be cut.

DIB: Diameter inside bark.

HANG-UP TREE: Any cut tree suspended above ground level.

HEALTHY REGENERATION: Young, healthy, dwarf mistletoe free conifers, less than 4.9 inches in diameter, free of defect or characteristics listed in Section II, 2.2.2.

LEAVE TREE: Trees that possess desirable characteristics and that serve to create the basis for designated spacing requirements or are otherwise designated to be left.

NON-SAWTIMBER TREE: For all conifer species, minimum diameter of 5 inches DBH to minimum diameter by species identified in Appendix B, Division A.

OVERSTORY REMOVAL: A cutting prescription where all trees greater than a specified size are cut. Trees less than the specified size are protected.

PAYMENT UNIT: See Treatment Unit.

PILING: Material moved to an agreed upon location shall be piled for future treatment by Forest Service.

PROGRESSION OF WORK: Work conducted in a progressive, workmanlike and orderly manner by the Contractor.

RESERVE CLUMPS: Groups of trees within a treatment area that are protected from cutting, may also include Individual Reserve trees.

SAWTIMBER TREE: Included timber meeting sawlog size specifications as defined in Appendix B, Division A.2.

SLASH: Woody material existing or created that has accumulated on the forest floor. Woody material includes logs, pieces of logs, tops, and branches.

UNIT: See Treatment Unit.

TEMPORARY ROADS: Non-permanent roads that are constructed by Contractor for the purpose of treatment unit access. Any road identified for construction or use that is not a Forest Service road, as listed in Appendix C.

TREATMENT UNIT: An individual area on the ground in which activities will be performed and which may appear as a separate pay item in the Schedule of Items.

UNSATISFACTORY WORK: If work quality falls below the AQL, the COR will issue a work order or notice of noncompliance to the Contractor in writing. Untreated or unsatisfactory treated areas shall be reworked to obtain satisfactory work quality.

WHOLE TREE YARDING: Whole tree logging includes cutting tree and removing the entire tree, including tops and branches, to the landing.

WILDLIFE TREE: Standing tree marked to be reserved as a wildlife tree. Used by birds and small mammals for shelter, nesting, perching, etc.

Exhibit 1 - Dwarf Mistletoe Rating System

Dwarf mistletoe management should only be considered after an analysis of the impacts that the parasite has in the trees, stands, and ecosystems they inhabit. One tool has been used for over 25-years to standardize the quantity of dwarf mistletoe parasitism within a stand.

The Hawksworth 6-class dwarf mistletoe rating system (DMR) provides a quantitative reference scale for determining the relative population status of a dwarf mistletoe infestation within a stand and its potential for spread and intensification.

The 6-class dwarf mistletoe rating system (DMR)
(Hawksworth 1977)

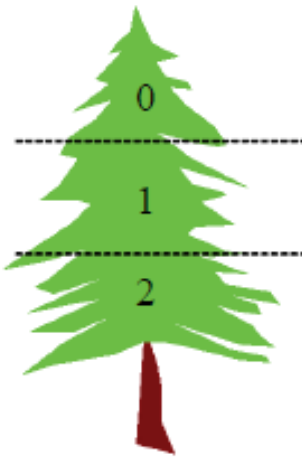
Instructions

STEP 1. Divide live crown into thirds.

STEP 2. Rate each third separately. Each third should be given a rating of 0, 1 or 2 as described below.
(0) No visible infections.
(1) Light infection (1/2 or less of total number of branches in the third infected).
(2) Heavy infection (more than ½ of total number of branches in the third infected).

STEP 3. Finally, add ratings of thirds to obtain rating for total tree.

Example



If this third has no visible infections, it's rating is (0)

If this third is lightly infected, it's rating is (1)

If this third is heavily infected, it's rating is (2)

The tree in this example will receive A rating of 0+1+2=3.

Hoffman, James T. "Management Guide for Dwarf Mistletoe". Forest Health Protection and State Forestry Organizations, May 2004. Web.