Schedule of Service Items and Specifications

Shady Rest – Forest Health 2026 Project

Contents

Shady Forest Health 2026 Project Technical Specifications

Scope of Work:

Treatments will be completed as Designation by Prescription as described in the specifications below. Trees will not be designated in the project area except in certain exceptional circumstances, and it is the responsibility of the contractor to understand and implement the contract specifications as written below. Whitebark Institute has sample marked areas for contractor reference. Inyo National Forest (INF) and Whitebark Institute (WBI) will regularly inspect work and provide feedback during the duration of the project.

Scope of Work Line Items:

1. **Overstory - Cut and Process**: Contractor selection, cut, and processing of overstory trees (10" – 29.9" diameter at breast height; DBH). Disposal of cull, tops, and limbs. Note: JP1 is 10" – 19.9" DBH.
   a. Timber Removal: Logs will be purchased by the CONTRACTOR and final payment will be contingent upon Contractor removal of logs per Exhibit F: Timber Removal.
2. **Understory:** Contractor selection and cut of trees 0.1 – 9.9" DBH; cut trees to be disposed of using biomass disposal (**Section 4**).
3. **Fuels Reduction**: Cut and disposal of standing dead trees and coarse woody debris (< 25" diameter). Disposal of slash, standing dead trees, and coarse woody debris described in **Section 4**.

Operational Timing*:* Work can start as soon as environmental conditions allow with additional restrictions in **Table 1** below.

Table 1: Treatment Summary by Unit (on next page)

Table 1: Treatment Summary by Unit

Unit	Acres	Overstory Basal Area (ft2/acre; 10-29.9" DBH)	TPA target (0.1 - 9.9" DBH)	Indv/Forest Matrix	Clumps	Clump Size	Openings	Species removal preference	Standing Dead Trees	Limitations & Additional Notes
JP1	44.7	Remove all trees < 20" DBH								All material, logs, and equipment cannot enter adjacent Project units and must enter and exit JP1 south to road 03S49. Equipment must be cleaned after JP1 and prior to entering other Project Units.
JP2*	132.2	60-120 (average of 80-100). Can be up to 200 in large clumps. Thin to <80 adjacent to active JPB.	40-65 if only understory trees present; 10 - 16 if understory and overstory trees present	**40-70% of a each unit** 1.Individuals are healthy trees > 30 inches DBH. 2. Trees 20 – 30 inches can be retained and treated as individuals (see specs) 3. Matrix areas are characterized by individual trees and irregularly spaced trees that provide continuity between clumps and openings.	**20 - 30% of each unit** 1. Trees with interlocking crowns or within 20 feet of another tree. 2. Largest and healthiest trees in the same 5-inch diameter class. 3. Generally contain trees > 15 inches DBH.	2-3 (max trees per clump = 5) Large clumps will be limited (<20% of clumps can be 'large')	**10-30% each unit** 1. Areas with little to no trees. 2. Range in size from 0.1 – 0.5 acres but can be up to 1.5 acres. 3. Incorporate a variety of shapes.	1. White Fir 2.Lodgepole 3. Jeffrey Pine	Cut and dispose of all standing dead trees regardless of DBH	Daily time restriction within 500 ft of western boundary: No equipment or chainsaws M-Sat 8 pm - 7 am or Sun
JP3*	45.6									Daily time restriction: No equipment or chainsaws M-Sat 8 pm - 7 am or Sun
JP4*	31.3									Daily time restriction: No equipment or chainsaws M-Sat 8 pm - 7 am or Sun
JP5a	2.4									<u>June 15 - Aug 14:</u> No work Mon - Thurs after 5 pm unless approved by PM. This is the ideal timeframe for this work. <u>After Aug. 15:</u> No work M-F after 3pm, Sat, or Sun unless approved by PM
JP5b*	10.4									
JP6*	55.6									None
JP7	79.9									None
JP Subtotal	**402.1**									
DMC1	23.7	60-120 (average of 80-100). Can be up to 200 in large clumps. Thin to <80 adjacent to active JPB.	40-65 if only understory trees present; 10 - 16 if understory and overstory trees present			2-3 (max trees per clump = 5) Large clumps will be limited (<20% of clumps can be 'large')		1. Lodgepole 2. Red fir 3. White fir 4. Jeffrey pine	Retain 1 snag every 10 acres	See RPMs for Mountain Pine Beetle
DMC2	33.2									None
DMC3	21.3									None
DMC4*	40								Cut and dispose of all standing dead trees	None
DMC Subtotal	**118.2**									
LP1	37.1	70-130 (average of 90-110). Can be up to 240 in large clumps. Thin to <100. adjacent to active MPB.	70-95 if only understory trees present; 18 - 24 if understory and overstory trees present			2-3 (max trees per clump = 9) Large clumps will be limited (<20% of clumps can be 'large')		1. White fir 2. Red fir 3. Lodgepole 4. Jeffrey pine	Retain 1 snag every 10 acres	See RPMs for Mountain Pine Beetle 450 GT of Lodgepole Pine may be decked within the unit for later public fuelwood collection instead of hauling to a final destination
Total	557.3									

*** Trees within strike disatance of the SCE utility line will be felled and logs removed by SCE. Contractor will dispose of slash using a Biomass Disposal Method.**

Item 1: Overstory Thinning: Cut and Process

*Treatments under this item will be completed using a combination of mechanical and hand methods to cut and process overstory trees. All material not utilized must be disposed of using one of the biomass disposal methods (**Section 4)**.*

1.1 **Overstory Leave Tree Density/Spacing:** Overstory leave tree density will vary by unit and be thinned to an ***average Basal Area (BA)*** given in Table 1, which varies by forest type.

- Tree spacing should vary and not be uniform – an 'ICO' pattern consisting of **individuals/forest matrix, clumps,** and **openings** is desired. Desired conditions also include a healthy forest where residual trees are vigorous and resilient to stressors (e.g., drought, pests, pathogens) and the stand structure supports and promotes low-severity fire.
- The ***average BA*** target will be achieved by thinning to a range of densities using the BA specifications in the two bullets below, with **40-70 % of the unit in individuals/forest matrix**, 20 – 30% in **clumps**, and 10 – 30% in **openings.**
    - In individuals/forest matrix and clumps, trees will be thinned to within the BA range given in **Table 1**. Large clumps can have a higher BA than what is included in this range, but large clumps will be limited (see **Table 1**).
    - BA can be as low as 0 in openings.
- To achieve the ICO pattern and BA targets, trees will be selected for removal/retainment based on CONTRACTOR Tree Selection Criteria described below.
- Each component of the ICO pattern will be irregularly spaced throughout the Project area (e.g., clumps will not all be in the same location).

1.2 **ICO Component Description/Specification**

***Individuals/Forest Matrix*:** Will cover 40-70% of a unit.

- Description:
    - Matrix areas are characterized by individual trees that are irregularly spaced and provide continuity between clumps and openings.
    - Individual trees are large, healthy, and vigorous; oftentimes these are old-growth trees.
- Relevant specifications:
    - To create individuals, remove all trees within 15 feet of the dripline of healthy trees > 30 inches DBH. Trees 20 – 30 inches can be retained and treated as individuals if vigorous, tall, co-dominant or dominant crown class, and/or if trees > 30 inches DBH are not present.
    - In the Jeffrey pine forest type, only Jeffrey pine will be treated as an individual.

Clumps: Will cover 20-30% of a unit; this is equivalent to 5-8 clumps per acre**.**

- Description:
    - Trees with interlocking crowns or within 20 feet of another tree.
    - Largest and healthiest trees in the same 5-inch diameter class.
    - Generally, clumps will contain trees > 15 inches DBH.
    - Not the same as a leave area: standing dead, ladder fuels, suppressed trees, etc. shall not be retained.

- Relevant specifications:
    - Will largely be composed of 2-3 trees; some larger clumps can be retained (up to 5 trees in Jeffrey pine and DMC; up to 9 trees in Lodgepole pine). See **Table 1**.
    - Larger clumps (> 3 trees) will be limited (<20 % of all clumps will be 'large'), especially within JP units.
    - Limit clumps within 100 feet of paved roads and Shady Rest Park.

Openings: Will cover 10-30% of a unit; this is equivalent to 10 – 30 openings per 10 acres (if making small openings [0.1 acres]) and 2 – 6 openings per 10 acres (if making larger openings [e.g., 0.5 acres]).

- Description:
    - Areas with little to no trees.
    - Range in size from 0.1 – 0.5 acres but can be up to 1.5 acres.
    - Incorporate a variety of shapes.
- Relevant specifications:
    - Where to create openings: Expansion of existing openings, areas with dense tree mortality, areas where suppressed trees are prevalent, areas where trees do not appear to be growing vigorously, near dense areas (e.g., tree clumps), areas with healthy tree regeneration.
    - Openings can be landings or skid trails.

1.3 **CONTRACTOR Tree Selection Criteria**

Live conifer trees will be evaluated by the CONTRACTOR to be removed (cut trees) or retained (leave trees) based on the Tree Selection Criteria below.

1.3.1 **Species Preference for Retention:** Species preference will vary by unit – see **Table 1**.

1.3.2 **Selecting Trees for Thinning:**

1.3.2.1 Tree Canopy Position and Health

- Selectively remove suppressed and intermediate trees and retain co-dominant and dominants that are healthy and vigorous.
- Small trees that are healthy, vigorous, and have growing space around them should be retained to encourage structural heterogeneity.
- Suppressed trees will not be retained.
- Beneath healthy co-dominants and dominants, remove small trees that could act as a ladder fuel.
- Focus on retaining and protecting healthy, old-growth trees, which are generally dominants, by removing trees within their dripline (see '***Individuals/Forest Matrix***' above). However, next to declining old-growth trees retain healthy intermediate trees even if they are within the dripline.
- Select "desirable trees" and those that are healthy and more vigorous than surrounding trees for retainment. This includes selecting trees for removal or retainment based on crown ratio, crown class, tree color, needle length (i.e., longer needles = healthier), needle retention, and dead branch abundance. See **Table 2** for details.

1.3.2.2 Pests and Pathogens

Residual trees should be free of obvious signs of pests and pathogens such as pitch tubes from pine beetles or mistletoe infection (see **Table 2**).

- Dead trees with pitch tubes: Cut all dead trees with pitch tubes.
- Live trees with pitch tubes:
  - Cut if > 1/3 circumference of the bole has pitch tubes; pitch tubes are generally red in color but can be white in color as well. This is a **successful attack** by pine beetles and the tree will die.
  - Trees with pitch tubes < 1/3 circumference of the bole (**unsuccessful attack**) can be retained to meet BA or TPA targets. However, these trees would be prioritized for removal over trees with no evidence of pests. These trees have been attacked by pine beetles but will likely survive.
- *Pine Beetle Disposal:* See disposal to prevent pine beetle spread in **RPMs.**
- Preference is to retain trees without mistletoe.

1.3.2.3 Wildlife Trees

- If needed to meet BA targets, retain healthy and vigorous trees larger than 20" DBH with existing cavities, dead tops, lightning scars, or structures beneficial to wildlife and any trees with raptor nests.

Table 2: *Evaluation criteria for designation of desirable, acceptable, and non-desirable trees.*

Characteristic	Desirable	Acceptable	Non-desirable
Live crown ratio	>40% for Jeffrey pine; >50% for other species	25 – 40% for Jeffrey pine 35 – 50% for other species	<25% for Jeffrey pine <35% for other species
Crown class	Dominant or co-dominant	Intermediate	Suppressed
Form defects	None	Minor (no significant weakening or toppling of the tree anticipated resulting from crooks, sweeps, or tight forks, etc.)	Major (significant weakening or toppling of tree anticipated; severe sweeps, crooks, or forks in lower 2/3 of tree)
Damaging agents	None	Bark missing from <50% of tree bole Some evidence of beetle activity along tree bole	Bark missing from >50% of tree bole Beetle activity along >1/3 of the bole

1.4 **Stump Height** Stumps shall not exceed, on the side adjacent to the highest ground, the maximum height of 8"; occasional stumps of greater heights are acceptable when CONTRACTOR determines that they are necessary for safe and efficient implementation. Unless otherwise agreed, CONTRACTOR shall re-cut high stumps so they will not exceed 8" in height and shall dispose of severed portions in the same manner as other activity-generated slash. All cut stumps shall have no residual live limbs left attached.

1.5 **Leave Tree Damage**: Trees that are excessively damaged (i.e., the cambium is exposed on 1/3 of the bole or more) shall be cut.

1.6 **Activity Generated Slash**: All tops, limbs and activity generated material created during the cutting operations that do not meet the utilization specification shall be disposed of using one of the methods as described in Section 4 (Biomass Disposal).

Item 2: Understory

Treatments under this line item are to be completed using a combination of hand and mechanical equipment to thin understory trees (0.1" – 9.9" DBH).

2.1 **Understory Tree Density/Spacing**: Thin understory trees to the TPA listed in **Table 1**.

2.1.1 Note that the value listed in **Table 1** is NOT a minimum TPA requirement. If there are no healthy understory trees present (e.g., only suppressed understory trees are present), then no understory need to be retained (the minimum TPA will not need to be met).

2.2 **Tree Selection Criteria**: See **section 1.2 – 1.5** above.

2.3 **Activity Generated Slash**: All tops, limbs and activity generated material created during the cutting operations that does not meet the utilization specification shall be disposed of using one of the methods as described in **Section 4**.

Item 3: Fuels Reduction

Treatments under this line item are to be completed using a combination of hand and mechanical equipment.

3.1 **Standing Dead Trees**: Standing dead trees (snags) will be cut and disposed of utilizing one of the biomass disposal methods (**Section 4**).

- In all JP units and DMC4: Cut and dispose of *all* snags regardless of DBH.
- In DMC 1, DMC2, DMC 3, and LP1: Retain 1 snag every 10 acres.
    - Prioritize retention of snags > 20" DBH, that are within the interior of the unit, and that are rotten, complex for falling, or have cavities for wildlife.

3.2 **Coarse Woody Debris**: Coarse woody debris (CWD) will be bucked and disposed of utilizing one of the biomass disposal methods (**Section 4**).

- Cut and dispose of sound coarse woody debris < 25" diameter. The minimum piece size to be piled shall be 3 " in diameter and 4 feet in length.
- Excessively rotten material which does not hold its form during transportation or is embedded in the surface may stay on site.

3.3 **Activity Generated Slash**: All tops, limbs and activity generated material created during the cutting operations that does not meet the utilization specification shall be disposed of using one of the methods as described in **Section 4**.

Item 4: Biomass Disposal

This item applies to disposal of line items 1,2, and 3. Contractor may choose one of the following methods (described in this item) to dispose of: non-merchantable timber not meeting the Utilization Specification, activity generated slash, standing dead trees, and coarse woody debris as described above.

4.1 **General Piling**

- All piles shall be neat, compact/tight, and constructed by laying limbs, stems, cut boles, and all other slash in the pile so it is conical in shape.
- All piles should be free of dirt.
- Piles must include a substantial amount (20% where possible) of finer fuels when available to aid in ignition and consumption. These added fuels shall be placed at the bottom of the pile and be progressively built up, beginning at the 1-hour size-class (fines), progressively increasing in size-class until you reach the maximum size of the material being piled. If fine fuels are not present to sufficiently meet the intent of acting as 'kindling', CONTRACTOR must notify the Whitebark/INF Project Manager (PM).

4.1.1 Hand Piles:

- The maximum pile size shall be 20 feet in diameter by 15 feet in height, and the minimum pile size shall be 8 feet in diameter by 8 feet in height unless otherwise approved by the PM.
- Slash shall be bucked to lengths no longer than 4 feet.

  All constructed piles shall receive one 4 foot wide by 4-foot-long sheet of waxed kraft paper in the top third of the pile, waxed side up. CONTRACTOR shall pile additional material (top third) on top of the kraft paper to prevent paper from moving off the pile.

4.1.2 Machine/Landing Piles

- The maximum pile size shall be 40 feet in diameter by 30 feet in height, and the minimum pile size shall be 12 feet in diameter by 12 feet in height unless otherwise approved by the PM.
- Slash shall be bucked to lengths no longer than 10 – 15 feet based on pile size.
- Piles shall be constructed by alternating the butt ends of the logs and tops to help provide fine material on either end of the pile, achieve pile compaction, and help aid in ignition. Piles shall be compact with few voids to keep snow and rain from penetrating.
- Piles greater than 15 feet in diameter shall be "lined" with a 4-foot horizontal distance surrounding the pile cleared to bare mineral soil and free of combustible material unless otherwise approved by the PM.

4.1.3 **Windrows:** Windrows are piles that are elongated to fit tight piling locations and are not conical in shape. All other parameters under General Piling apply.

- Hand units - Minimum height will be 8 feet
- Machine units – Minimum height will be 12 feet
- The maximum pile size shall be 50 feet in length by 20 feet in height by 20 feet wide unless otherwise approved by the PM.
- All material placed in piles shall be bucked to 10-foot lengths to facilitate tight piles.

4.2 Piling Locations

See **Table 3** below for where piling restrictions, listed in order of prioritization:

Table 3

Infrastructure/Item (in order of prioritization)	Pile size & pile distance from item		
	Piles < 12 feet in height	**Piles 12 - 20 feet in height**	**Piles > 20 feet in height**
Control Areas	No piling within control areas unless designated on the contract map		
Waterbody/watercourse	No piling within 25 feet of any waterbody/watercourse		
Powerlines, power poles, and buildings (of any size)	50 feet	100 feet	200 feet
Ormat Pipeline	50 feet	100 feet	100 feet
CDT Fiber Optic Line	10 feet		20 feet
CDT Fiber Optic Vault	10 feet		20 feet
USGS Tablets/Monuments	No piling within 5 feet		
Bole of leave trees	15 feet	20 feet	50 feet
Dripline of leave trees	Not within dripline		
Downed logs > 12" diameter on large end (regardless of decay class)	5 feet		
Other Piles	20 feet		
Rocks, stumps, swales, drainage ditches	Not on/within		
Paved Roads	25 feet		
Unpaved roads	10 feet where allowable		
XC Ski Trails	Not within 10 feet of centerline		
Trails	10 feet where allowable		

4.3 LP1 Only – Public Fuelwood Decking Option of Material meeting Utilization Specification

450 GT of Lodgepole Pine may be decked within the unit for later public fuelwood collection instead of hauling to a final destination. Decks must adhere to the following standards:

- Decks will be placed within 5 feet of roads to allow for public access, decks may not block roadways
- Neatly organized so that logs are stacked parallel to each other and left in a stable state with minimal risk of logs rolling or decks becoming unstable. Where possible decks will be perpendicular to roads to reduce rollout onto roads
- Maximum deck will not exceed 5 feet in height and 20 feet in width.
- Any changes to the above specs must be agreed upon between Whitebark and Contractor in writing.

4.4 Alternative biomass disposal methods

- Contractor may submit alternative biomass disposal methods including but limited to: purchase subject to agreement, air curtain burner/pyrolizer.

- Chipping and mastication will not be allowed for this project.

Inspections and Acceptance of Work

Whitebark Institute Project Managers (WBI PM) and/or INF representatives will be on site regularly to work with the contractor and provide feedback through compliance inspections. WBI's goal is to provide regular feedback throughout the duration of the project and to be available when questions arise to avoid final inspections that do not pass. However, the *Contractor is responsible for ensuring and maintaining quality control throughout the project.* All inspections will be completed by WBI PMs and/or INF representatives.

There are two type of inspections:

Compliance Inspections. Visual compliance inspections will be made on a periodic basis. Such inspections are not final and do not constitute acceptance by WBI and/or INF. These inspections will be conducted continually throughout the project.

Final Inspections. Final (formal) inspections for payment will be made on completed sub-items only. The *Contractor shall request final inspections in writing to the WBI PM with at least two business days advanced notice*. Inspections will be completed within five business days after the request for inspection is received.

Final Inspections

Final inspections are for the purpose of satisfying that the Contractor services provided are acceptable. Payment for work completed will be based on the results of the Final Inspection. The inspections will be plot based or through drone inspections as necessary. Plots will be located throughout the units to obtain a representative sample of the unit area where work was completed. Units will be inspected individually based on performance measures (listed below) according to contract specifications. Inspections across multiple units will not be combined for the purpose of determining the percentage of satisfactory work.

Performance Measures for Overstory Thinning (Item 1)

- Basal Area
- Height of stumps
- Log utilization
- Standing Dead Trees
- Coarse Woody Debris (CWD)
- ICO Proportion Targets
- Skid trail rehabilitation
- Landing rehabilitation

Performance Measures for Understory (Item 2)

- Trees per acre
- Height of stumps

Performance Measures for Fuels Reduction (Item 3)

- Standing Dead Trees
- Coarse Woody Debris (CWD)
- Height of stumps

Performance Measures for Biomass Disposal (Item 4)

- Pile location
- Pile height
- Pile density, form, and composition
- Use of wax paper (where required)
- Clearance to mineral soil (where required)

As needed, 1/20th acre plots (26.3-foot plot radius) every 5 acres that are evenly distributed over the treatment area, with a minimum of three plots per unit, will be sampled. The plot will be a fixed radius measured in horizontal distance.

On each plot the designated inspectors will record the plot number and whether the plot is satisfactory or unsatisfactory. If a plot is determined to be unsatisfactory the reason will be documented. Each plot will be examined to record findings of performance measures on individual items as listed below. To be considered satisfactory these items must meet the following criteria:

Item	Performance Measure	Inspection Metric	Pass	Fail
Overstory Thinning – Cut and Process (Item 1)	Basal Area	Remaining Basal Area	BA is within the range in Table 1	BA is less than or exceeds the range in Table 1
	Height of Stumps	Stumps less than 8 inches tall on the uphill side	≤1 trees per plot	>1 trees per plot fail
	Log Utilization	Logs meeting utilization are removed from project area	All material meeting utilization has been removed	Material meeting utilization has NOT been removed
	ICO Proportion Targets	ICO Proportion Targets met	≥ 90% of unit meets specifications	< 90% of unit meets specifications
	Skid Trail Rehabilitation	Rehabilitation to specification	Skid trails have been rehabbed to specification	Skid trails have NOT been rehabbed to specification
	Landing Rehabilitation	Rehabilitation to specification	Landings have been rehabbed to specification	Landings have NOT been

				rehabbed to specification
Understory Thinning	Trees Per Acre	Remaining Trees Per Acre	TPA is within the range in Table 1	TPA is less than or exceeds the range in Table 1
	Height of Stumps	Stumps less than 8 inches tall on the uphill side	≤1 trees per plot	>1 trees per plot fail
Fuels Reduction	Standing Dead Trees	Remaining Trees Per Acre	All standing dead trees have been cut	≥1 standing dead tree has NOT been cut without justification
	CWD	Remaining CWD Per Acre	All sound (non-rotten) CWD have been cut and piled	≥1 sound CWD has NOT been cut without justification
	Height of Stumps	Stumps less than 8 inches tall on the uphill side	≤1 trees per plot	>1 trees per plot fail
Biomass Disposal	Pile location	Pile location met	≥ 90% piles meet specifications	< 90% piles meet specifications
	Pile height	Pile meets minimum and max specifications	≥ 90% piles meet specifications	< 90% piles meet specifications
	Pile density/form/composition	Pile meets Section 4.1	≥ 90% piles meet specifications	< 90% piles meet specifications
	Wax paper	Use of wax paper (where required)	≥ 90% piles meet specifications	< 90% piles meet specifications
	Mineral soil	Clearance to mineral soil (where required)	≥ 90% piles meet specifications	< 90% piles meet specifications

Final Inspection Acceptance

Work on this Agreement will be deemed acceptable when a **score of 90 percent or more is achieved.** A score of 80 percent or higher is required for payment.

For initial scores below 90 percent, the Contractor will have an opportunity to complete necessary rework to achieve a score of 90 percent or higher.

Re-inspection after Rework

The unit may be reworked ONCE and then re-inspected. If the re-inspection yields less than 90 percent, WBI holds the right to pay for the work completed based on the following:

- For a score of 80 percent or more but less than 90 percent, 2 percent of the unit price pay will be deducted for that unit for each percentage point below 90 percent.
- If the inspection score is less than 80 percent, no payment will be issued.

Disputed Inspection

The Contractor may request re-inspection if the results are disputed. Re-inspection must be requested in writing within 48 hours after receiving written notice of the inspection results. Re-inspection will be accomplished within five business days after receipt of the Contractor's written request.

The same plot sampling and inspection procedures will be used; however, new plots will be taken. The inspection pattern will be shifted so that new plots do not overlap with previously inspected plots. Results will be rounded to the nearest whole percent.