

December 5, 2025

Regional Forester
Objection Reviewing Officer
Pacific Northwest Region
USDA Forest Service
Attn: 1570 Appeals and Objection
1220 SW 3rd Ave.
Portland, OR 97204

To Whom it May Concern:

I am writing to file an objection to the Okanogan-Wenatchee National Forest's proposed Midnight Restoration Project ("project"), located on the Methow Valley Ranger District in north-central Washington. The responsible official is Forest Supervisor Tara Umphries. Throughout this letter, I will be referring to these entities collectively as the U.S. Forest Service (USFS).

The project will entail various vegetation treatments and road management actions across a 53,000-acre portion ("project area") of the Twisp River, Rader Creek, and Wolf Creek sub-watersheds. Up to 11,374 acres will be treated with overstory (commercial thinning), up to 13,895 acres with understory (non-commercial) thinning, and up to 27,352 acres with prescribed fire. Up to 141 miles of open roads will be subject to hazard tree removal, 8.3 miles of new temporary roads will be constructed for log hauling, and 53.5 miles of existing roads will be decommissioned.

I submitted timely, written comments on the project during both scoping and the draft Environmental Assessment (EA) phase; these comment letters are included as Attachments 1 and 2, respectively. My comments generally dealt with the project's overstory thinning treatments. I supported, and continue to support, other aspects of the project including prescribed burning, understory thinning, and road decommissioning.

In my objection, I will be focusing on an issue that I previously raised about the overstory thinning treatments; namely, that the treatments need certain safeguards to ensure that they will be appropriately implemented.

Mission Restoration Project as a Cautionary Tale

In my previous comment letters, I repeatedly mentioned another Methow Valley Ranger District project in reference to my concerns, the Mission Restoration Project. That is because Mission, despite having significant buy-in from the scientific and conservation community during the planning phase and thinning prescriptions that looked reasonable in the EA, had commercial thinning that was poorly implemented on the ground, particularly in the Buttermilk Creek drainage.

Most critically, the thinning prescriptions included in the timber sale documents were inconsistent with what was evaluated and presented to the public in the EA. Please refer to the table on the following pages, which I prepared and shared with the District in a letter dated February 20, 2023.

Key Points of Divergence between Environmental Assessment and Timber Sale Contract Documents, Mission Restoration Project, Methow Valley Ranger District, Okanogan-Wenatchee National Forest.

Topic	What the EA Says	What the Contract Says	Issues
<p>A. Leave trees per acre (TPA): general numbers</p>	<p>EA Appendix A gives the following TPA targets/guidance for the commercial prescriptions:</p> <p>For <u>Dry Forest Restoration Thin</u> (DFR), TPA is broken down by plant association group (PAG):</p> <ul style="list-style-type: none"> • Hot-dry: 20-30 • Warm-dry: 30-50 • Cool-dry: 40-50 <p>For <u>Aspen Release</u>, TPA is 10 TPA within aspen clones and a 50-foot buffer. TPA outside of those areas should reflect DFR or Dry Forest Thin with Dwarf Mistletoe Reduction prescription guidelines, depending on stand conditions.</p> <p>For <u>Variable Retention Harvest</u> (VRH), no TPA target/guidance is given.</p> <p>For <u>Dry Forest Thin with Dwarf Mistletoe Reduction</u> (DFDMT), TPA targets are to follow those given for DFR, other than that the removal of mistletoe trees “may result in post-harvest conifer stocking levels up to approximately 25 percent less than the respective DFR desired residual tree stocking number.” That suggests the following TPA targets by PAG:</p> <ul style="list-style-type: none"> • Hot-dry: 15-22.5 • Warm-dry: 22.5-37.5 • Cool-dry: 30-37.5 	<p>The Special Provisions document gives the following TPA targets/guidance for the prescriptions:</p> <ul style="list-style-type: none"> • DFR hot-dry: 20-30 • DFR warm-dry: 30-40 • Aspen Release: 20-30 • VRH: 20-30 • DFDMT: 20-30 	<p>(1) DFR warm-dry TPA target has been dropped from 30-50 to 30-40. While the upper end of a TPA range may not matter as much as the lower end because the latter is what the purchaser/contractor will likely aim for on the ground, the public was nevertheless given a greener picture than what was put in the contract, a common theme throughout this table.</p> <p>(2) No DFR cool-dry units are identified; see Topic C below.</p> <p>(3) Aspen Release, VRH, and DFDMT units have been given a blanket 20-30 TPA target, apparently without regard to PAG. This is not as described in the EA. The EA had indicated that TPA targets in DFDMT units would vary by PAG (up to 25% reduced from the corresponding DFR targets) and that Aspen Release units outside of aspen clones and the 50-foot buffer would have prescriptions (and presumably also TPA targets) that varied according to stand conditions. Moreover, some of these units should have been classified as cool-dry, with a much larger TPA target; see Topic C below.</p>
<p>B. Leave trees per acre when mistletoe is present</p>	<p>From EA Appendix A, p. 340: “Target numbers and preferred species of leave trees would be applied to site conditions within the harvest unit and would vary based on available merchantable timber volume and plant association group and would be reduced based on root disease and dwarf mistletoe levels.”</p>	<p>The Special Provisions document prefaces the list of TPA targets by stating: “When Douglas fir mistletoe is present within the subdivision, 75% of the leave tree per acre target will be acceptable.” This suggests TPA levels as low as:</p> <ul style="list-style-type: none"> • DFR hot-dry: 15-22.5 • DFR warm-dry: 22.5-30 • Aspen Release: 15-22.5 • VRH: 15-22.5 • DFDMT: 15-22.5 	<p>1) The purchaser/contractor is not instructed to assess levels of mistletoe infestation as the EA suggests; they may simply apply a 25% TPA reduction whenever mistletoe is <i>present</i>, which is presumably always.</p> <p>2) The District has over-applied the mistletoe reduction for DFDMT units. EA Appendix A allowed for 25% fewer TPA in DFDMT units than for the corresponding DFR PAGs (see Topic A). But the Special Provisions applies this reduction a second time, effectively allowing 15-22.5 residual TPA in all DFDMT units. Under the EA, this would have only been allowed for hot-dry units. The DFDMT units are not all hot-dry; in fact, some are cool-dry (see Topic C).</p>

Topic	What the EA Says	What the Contract Says	Issues
C. Cool-dry plant association group (PAG)	<p>Per EA Appendix A, the plant association groups in the analysis area are derived from <i>Field Guide for Forested Plant Associations of the Wenatchee National Forest</i> (Lillybridge et al. 1995). Figure 140 identifies the analysis area's dry forest PAGs as hot-dry (ponderosa pine or Douglas-fir seral), warm-dry and warm-mesic (Douglas-fir seral) and cool-dry (Douglas-fir and subalpine fir seral).</p> <p>Per Lillybridge et al. (1995), any stand with more than a trace of subalpine fir or Engelmann spruce "suggest an association more moist than the Douglas-fir series" (p. 52), and "all stands with Engelmann spruce will key to the subalpine fir series" (p. 88). All subalpine fir PAGs are classified as cool or cold. The best fit for the analysis area's subalpine fir PAGs appears to be ABLA2/PAMY (p. 234), in which ponderosa pine can represent more than a minor stand component.</p>	<p>The contract documents do not explicitly identify any cool-dry units in the timber sale. However, 17 of the units contain subalpine fir and Engelmann spruce as shown in the Volume Summary. Fifteen of these 17 units are either overtly classified as warm-dry in the Special Provisions (2, 6, 8, 19, 141, and 144), or given a TPA target of 20-30, suggesting a warm-dry or even hot-dry association (4, 9, 21, 22, 23, 24, 38, 39, and 51). One of the 17 units (1) is classified as Moist Forest. The remaining unit (13) is not given an explicit PAG or TPA target.</p>	<p>(1) According to Lillybridge et al. (1995), which the District supposedly used to classify the analysis area's PAGs, the 17 units identified in the Volume Summary as containing subalpine fir and Engelmann spruce should be keyed to the ABLA2 series and are at least cool-dry, if not moist.</p> <p>(2) To be consistent with the EA, all of the DFR units in this group should have been given a TPA target of 40-50 rather than the 30-40 shown in the Special Provisions. All DFDMT units in this group should have been given a TPA target of 40-50 rather than 20-30. All of the Aspen Release units in this group should have been given a TPA target of 40-50 outside of aspen clones and the 50-foot buffer, rather than a blanket TPA target of 20-30 for the whole unit. Considering that the Special Provisions permit an additional 25% reduction for the presence of <i>any</i> mistletoe in these units, this represents a significant departure from the EA's stated vision for cool-dry PAGs in the analysis area.</p>
D. Removal of subalpine fir, Engelmann spruce, and lodgepole pine	<p>EA Appendix A places subalpine fir, Engelmann spruce, and lodgepole pine at the bottom of the list of conifers preferred for retention. However, the EA also requires the retention of all trees 21 inches DBH or greater with an estimated age of 150 years or more (see Topic E below).</p>	<p>The Special Provisions instruct the purchaser/ contractor to "remove all subalpine fir, lodgepole pine, and Engelmann spruce between 7.0" DBH and 23.9" DBH."</p>	<p>(1) Scientists and the lay public did not sign off on the wholesale removal of these or any other tree species. If this parameter had been included in EA Appendix A, there would have been pushback from scientists, conservation groups, and the lay public. The parameter seems designed to convert the PAG of the units in question from subalpine fir seral to Douglas-fir or ponderosa pine seral. While the District may view this as a necessary "fire-proofing" measure, it is ecologically suspect and was not evaluated in the EA.</p> <p>(2) The Special Provisions' requirement to remove all subalpine fir, Engelmann spruce, and lodgepole pine <24" DBH directly contradicts the EA's assertion that all older trees ≥21" DBH will be retained.</p>
E. Removal of trees 21-24" DBH	<p>EA Appendix A states that trees ≥21" DBH with an estimated age of 150 years or greater would be retained, while trees 21-24" DBH with an estimated age of less than 150 years "would occasionally be harvested to release a larger (more preferred species) tree, reduce dwarf mistletoe infection, or reduce conifer encroachment in aspen stands." An example of the latter scenario would be in the DFDMT units, where younger mistletoe-infected trees 21-24" DBH "would be harvested on a case by case basis consistent with stand treatment objectives."</p>	<p>The contract does not explicitly require any trees ≥21" DBH to be retained. Moreover, the following 21-24" DBH trees <i>must</i> be removed irrespective of age: (a) subalpine fir, lodgepole pine, and Engelmann spruce, (b) mistletoe trees with a Hawksworth rating of 3 or greater, (c) in Aspen Release units, conifers within 50 feet of an aspen clone, and (d) in Aspen Release and DFDMT units, trees with any mistletoe.</p>	<p>(1) While the EA emphasizes retention of trees ≥21" DBH and establishes specific conditions for their removal, the contract documents do just the opposite -- they place no apparent limitations on removal of this size class and in fact <i>require</i> removal of these trees in a number of situations. The EA's requirement to retain older trees ≥21" DBH was stated multiple times in Appendix A — first in the General Commercial Thinning Parameters, and then for each commercial prescription. That this requirement did not make it into the contract itself is inexcusable.</p>

Note that the table only covered those discrepancies that I considered to be the most glaring, and was not exhaustive. All told, the discrepancies resulted in a timber sale contract getting executed that was fundamentally disconnected from the NEPA work that preceded it. This was not fair to the public or to the USFS's partners, and suggests that the EA may not have appropriately evaluated the effects of the proposed action or drawn the appropriate conclusions regarding significance.

Secondarily, the timber sale purchaser and its contractor did not fully conform to the contract documents in implementing commercial thinning in the Buttermilk Creek drainage. This was demonstrated by the Methow Valley Citizens Council (MVCC) through extensive on-the-ground monitoring. Although the District disputed many of MVCC's field observations after performing their own monitoring (see Attachment 3 for the District's response report, which also summarizes MVCC's observations), I do not doubt MVCC's findings and feel they more accurately portray the "real world" conditions on the landscape given the larger (3-acre) plot size that was used.

Moreover, the District's own monitoring points to additional causes for concern. First, the District's residual trees per acre (TPA) estimates for the five treatment units addressed in their response report were consistently at or near the bottom of the TPA range prescribed in the contract documents. This trend is even more pronounced if you compare residual TPA with the higher TPA ranges that were given in the EA¹. Second, for the same five treatment units, the contractor's implementation monitoring consistently showed higher residual TPA than the District's confirmation monitoring. An optimistic interpretation would suggest that the contractor and the District were not on the same page about treatment outcomes. A more pessimistic view might suggest that the contractor performed implementation monitoring in a way that made it appear they were leaving more TPA than they actually were.

After I submitted my letter and discrepancy table to the District, I received a call from then-acting District Ranger Julie Bain. We had a frank discussion about the Mission project during which she acknowledged that the USFS staff preparing the timber sale documents were inexperienced and there had not been adequate oversight over the process. Although this was discouraging on the one hand because it seemed so preventable, I did appreciate Julie's honesty. Later I learned that the District took corrective action in response to MVCC's letter, applying the EA's individuals, clumps, and openings (ICO) objectives, which were missing from the contract documents, to the contract's future harvest units. Both of these outcomes pointed to the District's ability to acknowledge and learn from its mistakes. It is in this spirit that I bring my objection, and provide suggestions for "Mission-proofing" Midnight.

At Issue for Midnight

As I see it, several aspects of Midnight's overstory thinning treatments make it vulnerable to poor implementation outcomes, similar to what took place on Mission. The first is simply that the treatments are being implemented through timber sales, rather than through a USFS-retained contractor. In both of my comment letters, I had suggested that Bipartisan Infrastructure Law (BIL) funds could be used to hire out the work, rather than counting on the purchaser to think ecologically and economically at the same time. This comment was based on some articles I'd read about BIL

¹ Please note that in the District's sampling results table (pages 3 and 4 of the letter), the column 2 heading is in error as the TPA ranges in this column are from the contract documents and not the EA.

monies being directed toward forest restoration work, including on the Okanogan-Wenatchee. But in the USFS's Midnight Response to Comments spreadsheet, they stated "there are no current or planned appropriations allocated towards timber harvest," which I am taking to mean there is no flexibility around Midnight's overstory thinning being implemented through timber sales.

With that being the case, the next points of vulnerability are in the prescriptions themselves. Two in particular that stand out to me are: (1) use of residual TPA ranges rather than specific targets and (2) providing exceptions to the 20.9" upper diameter limit for harvestable trees. I discuss these in more detail below.

Residual TPA Ranges

Midnight's overstory thinning prescriptions (see Appendix A of the Final EA) provide residual TPA ranges (e.g. 20-30, 30-40) rather than specific targets (e.g. 25, 35). This looks good on paper; the typical reader might assume that actual TPA post-implementation will reflect the full range for any given prescription, possibly averaging out somewhere in the middle.

But given that the trees are to be removed by the purchaser (or its contractor), and assuming that these will be designation by prescription (DxP) contracts as has been the case for other recent projects, then residual TPA is much more likely to average out near the bottom of each range. The purchaser will understandably be trying to maximize profits, and there would be no clear incentive to leave trees behind above the minimum. As noted above, residual TPA estimated by the District for five Mission treatment units was consistently at or near the bottom of the unit's prescribed range.

Using TPA ranges rather than specific targets downplays the project's environmental effects by making it appear that commercial harvest will be lighter-touch than it actually will be. I am also not clear as to whether the EA assumed a realistic scenario of residual TPA at or near the bottom of each of the ranges given for the overstory thinning prescriptions, or if it took a more optimistic view. If the latter, then it should be revised to reflect what is most likely to occur on the ground.

Exceptions to Upper Diameter Limit

The Final EA provides several exceptions to the 20.9" upper diameter limit for overstory thinning. First, in any treatment unit, trees between 21" and 24.9" diameter at breast height (dbh) may be felled as hazard trees. Second, in areas with Late Successional Reserve (LSR) prescriptions, trees 21-24.9" dbh may be removed if there is an "excess" of trees greater than 20" dbh and/or if they have a dwarf mistletoe rating ≥ 2 and are within 40 feet of a healthy tree that is > 18 " dbh.

I appreciate that the Final EA has removed the latter two exceptions from the overstory thinning prescriptions for Matrix, Riparian Reserve, and Owl Habitat Enhancement. But as I pointed out in my Draft EA comment letter, retaining these exceptions for any prescriptions leaves an unacceptable amount of wiggle room for removing some of the largest trees in our forests, particularly in light of the economic gains (i.e. conflict of interest) associated with each of these felling decisions.

On the other hand, I understand the need to fell hazard trees and don't find that particular exception to be problematic given the Final EA's requirement that these removals be approved by the USFS timber sale administrator or inspector.

Mission-Proofing Midnight

In my opinion, the best way for overstory thinning under Midnight to avoid the missteps of Mission within a timber sale framework is to execute only designation by marking (as opposed to DxP) contracts. I highlighted the need for a designation by marking approach in my scoping comment letter, and still feel strongly that this is the appropriate way to implement Midnight.

While I understand designation by marking would require more boots on the ground at a time in which the USFS is already short-staffed, I believe the District would find many willing volunteers to assist with this process. For example, I was one of a group of volunteers affiliated with MVCC who worked with USFS Eastern Washington Area Ecologist Kerry Kemp to install stand monitoring plots in the Twisp Restoration Project area this summer and fall. Our group, along with others in other districts, collected data on a total of 125 plots in 2025, at a time when the USFS did not have crews available to do the work themselves. I am certain many of the folks from my group would happily partner with the USFS to mark trees for the Midnight Restoration Project.

Regardless of whether the contracts are executed as designation by marking or DxP, the USFS should commit to the following:

- Set specific TPA targets rather than ranges. To minimize ecological tradeoffs², and given that the upper end of each TPA range was presumably adequate to address project needs, the TPA target for each prescription should be the upper number of the range that was initially given (e.g. 20-30 would become 30, 30-40 would become 40).
- Set a clear, upper-diameter limit of 20.9" for all prescriptions³, other than hazard tree removal as authorized by USFS timber sale administrator or inspector.
- Maintain rigorous QA/QC procedures over timber sale contracting. If the sales are executed as DxP, the prescriptions must be scrupulously reviewed to ensure consistency with the EA⁴.
- Implement a consistent, repeatable, and rigorous monitoring program that is mutually agreed upon between the USFS and its partners⁵. Monitoring under this partner-backed program should be conducted before, during, and after thinning treatments (in addition to

² I mentioned various ecological tradeoffs of the proposed overstory thinning treatments in my comment letters; for example, loss and degradation of habitat for forest-dependent wildlife, habitat fragmentation and decreased landscape permeability, introduction of habitat conditions favorable to the barred owl, introduction of noxious weeds, and soil erosion.

³ I also made this recommendation in my Draft EA comment letter.

⁴ I mentioned the need for consistency with the NEPA document in my scoping comment letter.

⁵ I have lifted this language almost verbatim from the District's response report (Attachment 3). It was suggested by the District as a way to avoid miscommunication, address a range of partner interests, and further the shared objective of a healthy forested landscape resilient to high-intensity wildfire.

any monitoring provided by the contractor) to ensure the treatments are appropriately implemented and to identify the need for corrective action. As noted above, there are many local volunteers who are already familiar with USFS stand monitoring protocols and would be motivated to assist with this program.

Connection between Prior Comments and This Objection

In this objection, I have fleshed out an issue that I raised during my scoping and Draft EA comment letters; namely, that Midnight's proposed overstory thinning treatments need certain safeguards to ensure that they will be appropriately implemented, particularly in light of poor outcomes on the recent Mission Restoration Project. My comment letters made several recommendations for such safeguards, including completing the work using a USFS-retained contractor, utilizing a designation by marking approach rather than DxP, removing the exceptions to allow harvest of trees ≥ 21 " dbh, and ensuring that the prescriptions evaluated during the NEPA process are what ultimately get implemented on the ground. I have addressed these and other possible safeguards in this objection, have provided justification for the safeguards, and have shared ideas for how and when the safeguards can be put into place.

Conclusion

As stated in the EA, our dry forests have departed from the conditions that were present prior to European settlement, and certain restoration activities are warranted to increase their resilience to natural disturbances and the effects of climate change. I personally feel we can achieve desired levels of resilience in the Midnight project area through prescribed burning and understory thinning alone, without the need for commercial (overstory) thinning. However, I understand that commercial thinning may be needed to offset the cost of other treatments, and I also understand that the USFS has mandatory timber targets to meet.

With that in mind, I have highlighted ways in which the overstory thinning component of the Midnight Restoration Project can be improved to ensure it is implemented appropriately on the ground. Nobody wants a repeat of what happened with the Mission project – the missteps or the community backlash that followed. The safeguards I've presented will improve ecological outcomes, strengthen public support for the project, and create new opportunities for USFS/public collaboration in our close-knit Methow Valley community.

Thank you for your consideration,



Rebekah Jensen

Attachment 1: R. Jensen Scoping Comment Letter

Data Submitted (UTC 11): 6/10/2023 3:05:11 AM

First name: Rebekah

Last name: Jensen

Organization:

Title:

Comments: In your scoping letter for the Midnight Restoration Project, you asked for input in several specific areas: (1) viable alternatives to the proposed action, (2) important information about the project area, (3) concerning effects of the proposed action, and (4) National Forest System roads. I'm primarily interested in topics 1 and 3, and will be dealing with those in my comment letter.

For topic 1, I feel that understory thinning and prescribed burning strike a much better balance between your identified needs of increased resilience, reduced risk to people, and protection of wildlife habitat than overstory thinning, which currently accounts for 12,120 acres of your project area. If overstory thinning under Midnight is to resemble the cuts I've seen so far under Mission, then wildlife habitat is seriously at risk. Far from preserving and enhancing habitat for the northern spotted owl, all the edge habitat introduced by the Mission cuts promise to bolster one of the major threats to spotted owl recovery, the barred owl. And let's hope the Midnight project's version of protecting lynx habitat doesn't resemble Mission's timber sale contract, the prescription for which called for the removal of all lodgepole pine, Engelmann spruce, and subalpine fir below 24 inches in diameter.

As I understand it, the Okanogan-Wenatchee National Forest has forest restoration funds available through the Bipartisan Infrastructure Law, so there shouldn't be the need for a commercial component to the Midnight project. If overstory thinning absolutely must occur, then it should be completed by a contractor rather than a purchaser, and should utilize a leave-tree-mark process 100% aligned with the NEPA document that is ultimately prepared for Midnight.

For topic 3, I am concerned with the proposed action's effect on forest-dependent wildlife like the northern spotted owl, northern goshawk, marten, and fisher, just to name a few sensitive species. I am concerned about the proposed action's effect on old forests, and personally feel that the only appropriate activity in Late Successional Reserves and Forest Plan Old Growth is prescribed fire. I am concerned about the proposed action's effect on soils and aquatic resources. I am concerned about the proposed action's effect on the human experience, as converting the wild Middle and Upper Twisp River landscape to a highly managed, fragmented woodlot will diminish people's connection to this special place and, possibly, their interest in protecting it.

Attachment 2: R. Jensen Draft EA Comment Letter

Data Submitted (UTC 11): 5/17/2024 6:47:34 AM

First name: Rebekah

Last name: Jensen

Organization:

Title:

Comments: Thank you for the opportunity to comment on the Midnight Restoration Project. As with the other recent restoration projects proposed/implemented on the Methow Valley Ranger District, there are several aspects of the project I wholeheartedly support. I applaud the use of prescribed fire, understory thinning to remove ladder fuels and trees < 10" DBH, and road decommissioning to decrease erosion, sedimentation, and habitat fragmentation.

Also similar to your other recent/current projects, I have several main concerns, all centered around the proposed overstory thinning treatments. Most critically, I am unclear why the timber sale model is being utilized for this project, given the funding made available through the Bipartisan Infrastructure Law. If we didn't have to commodify our trees, the focus of the treatments could remain squarely in the project's stated needs -- in particular, Needs #1, 2, and 4. I have no doubt that the overstory thinning carried out under the Mission Project would have looked very different if completed by a contractor working for the USFS, rather than a contractor working for the purchaser, in an environment where everyone was trying to maximize their profits.

Given that the District will likely proceed with the timber sale model, however, there are a few other concerns I wish to highlight. First, the exceptions to the 21" DBH diameter cap in effect just makes for a blanket 25" DBH diameter cap. The dwarf mistletoe rating criteria look reasonable on paper, but in the field that is presumably quite subjective and would be particularly squishy to a contractor working for the purchaser of the trees. Again thinking of the Mission Project, diameters may be underestimated on the ground and sticking with a clear, no-exceptions lower diameter limit will hopefully at least keep the actual limit within a couple inches of that.

Second, I am concerned about planned logging on steep slopes. The EA contemplates harvest operations on slopes of 45-80% using cable, tether, or helicopter logging. Again, the Mission Project provides an example of what not to do. Significant soil disturbance from tracked equipment and deep rutting from cable logging can be seen on the moderate to steep slopes in some of those cutting units. Cable logging also damaged large/old trees in that timber sale.

Third, I do not support the creation of new shaded fuelbreaks within 200 feet of roads and ridges. This creates extensive new "edge" habitat and contributes to habitat fragmentation, without clear gains in protecting the WUI (unless located literally at the WUI's edge). Roads already affect the permeability of the landscape for many wildlife species, even without an extra 200 feet of cleared forest on either side. And establishing new fuelbreaks along ridges where no roads currently exist introduces unnecessary new disturbance to otherwise natural areas, invariably (and irreversibly) introducing noxious weeds and soil erosion, and diminishing wildlife habitat value, all for theoretical catastrophic fires that may or may not ever encounter that ridge, and may or may not be stopped by the fuelbreak.

These are just a few of my concerns. I hope you will give *real* consideration to comments received from science- and conservation-minded individuals and groups during the NEPA process, and respond not just by further building your case for the Proposed Action, but by exploring ways of meeting project objectives that have fewer ecological tradeoffs.

Thank you for your time and attention.

Attachment 3: USFS Response to MVCC Report

Response to MVCC's "Treatment Monitoring Report"

Mission Restoration Project

January 10, 2023

Introduction

The Forest Service received a copy of the "Treatment Monitoring Report" (Report) of the Mission Restoration Project completed by the Methow Valley Citizen's Council (MVCC) on November 2, 2022.

We appreciate the effort MVCC took to evaluate and quantify treatment outcomes on several implemented units within the Mission Restoration Project to substantiate their concerns about the implementation of the project. As the Forest Service works to expand the pace and scale of forest restoration across the Okanogan-Wenatchee National Forest, we recognize that a key element in restoring ecological function and maintaining resilience in a changing environment is the **quality** of these restoration efforts. The Mission Restoration Project and the concerns raised by MVCC in Report give us the opportunity to collaboratively engage in learning and assessment and ensure that the quality of restoration treatments is continuously improved as we implement larger and more complex projects in the future. The Report highlights an opportunity for partners to work with the Forest Service to develop **consistent, repeatable, and rigorous monitoring** that is mutually agreed upon to assess outcomes and ensure contract specification and prescription targets are being met.

We will address the issues raised in the Report as they pertain to the Mission Restoration Project's silvicultural objectives, prescriptions, parameters¹, and operational results, aiming to create a common understanding and shared dialog about how these issues can be improved in future project planning and implementation. We trust that continued conversations will result in outcomes that meet the multiple ecological, social, and economic objectives of our project plans.

Issues and Responses

Issue 1

The Mission DXP (designation by prescription) contract specifies fewer residual trees per acre (TPA) than the Mission Restoration Environmental Assessment (EA) and is therefore inconsistent with the EA (Treatment Monitoring Report, pp. 2, 4-5).

Response 1

Upon review, we believe that Mission DXP contract specifications meet the standards for residual trees per acre listed in the EA. The EA lists silvicultural prescriptions by unit type and identifies treatment parameters to be applied during commercial thinning. The EA states (EA, p. 337-344) that to meet the purpose and need of the project, more than one treatment parameter would be applied to an individual unit where needed to meet landscape objectives. The prescriptions are intended to work together to achieve the desired future condition.

¹ Objective = a landscape goal

Prescription = the method for cumulative treatment of the landscape

Parameter = the specific, often minute, details to fulfill a prescription for different stand types during commercial thinning

The EA's general commercial thinning objectives include reducing dwarf mistletoe infection, reducing the encroachment of conifers into aspen stands, and retaining the largest and most vigorous preferred coniferous species (EA, p. 140). Notably, the second general thinning parameter states "target numbers and preferred species of leave trees would be applied to site conditions within the harvest unit, would vary based on available merchantable timber volume and plant association group and *would be reduced based on root disease and the presence of dwarf mistletoe (emphasis added)*" (EA, p. 140). The full text of parameters from the EA are included as Appendix A.

The EA applies these treatment parameters to all commercial thinning prescriptions (Aspen Release, Dry Forest Restoration Thin (DFR), Dry Forest Restoration Thin with Dwarf Mistletoe Reduction (DFDMT), and Moist Forest Thin (MFT)). For example:

- The Aspen Release prescription states that "conifer stands...which are located outside of aspen clones and more than 50' away from aspen clone perimeters would be treated with the DFR or DFDMT harvest treatments...*depending on existing stand conditions (EA, p. 341).*"
- The DFDMT prescription states that the "removal of suppressed, diseased, or dwarf mistletoe susceptible trees may result in post-harvest conifer stocking levels up to approximately 25% less than the respective *DFR desired residual tree stocking numbers displayed above*" (EA, pp. 342-344).
- The residual TPA within the DFR units would be reduced based on root disease and the presence of dwarf mistletoe. This TPA reduction is possible because the DFR and DFDMT prescriptions work to support each other (EA, pp. 341-342).

Though the prescriptions "Aspen Release" and "DFDMT" will apply in their entirety to specific units, they are also intended to apply to DFR units throughout the project area to meet silvicultural objectives (EA, p. 339-344). Not every acre of every DFR unit was intended to receive reductions for root disease, mistletoe infections, or aspen release, but reductions were intended to be applied where it makes sense silviculturally to meet stand health, composition, and resilience objectives. Ultimately, forest structure and stand health at the time of treatment will determine how treatments are implemented on the landscape.

Issue 2

The implementation of the Mission DXP contract fails to leave the required number of trees per acre listed in the EA (Treatment Monitoring Report, pp. 4-5, Table 1).

Response 2

The response to Issue 1 establishes that the residual trees per acre will vary by the existing silvicultural conditions in a unit. Forest Service staff monitor harvest activities and operations and conduct regular, often daily, inspections. Monitoring plots are installed every 20 acres by the Contractor and verified by the Forest Service to ensure silvicultural compliance across different prescriptions. To date, the contractor has been in full compliance with all contract specifications.

After receiving MVCC's Report, Forest Service staff attempted to replicate the sampling method presented. Staff were unable to replicate the sampling methodology because of inconsistencies

between spatial and ground monumentation, boundary discrepancies, and missed “count” trees within plots. Because Forest Service staff were unable to replicate the Report’s methods, we developed a statistically valid sampling design (Forest Mensuration, Husch, Miller, Beers, pp. 200-228) to check the Report’s findings. The design for this “confirmation” monitoring installed plot grids on units using ArcGIS Pro Fishnet analysis tools (see maps). This method identified sampling locations at a frequency of one plot approximately every four acres; staff collected data using 1/10- and ¼-acre nested plots at these locations.

This “confirmation” monitoring, along with ongoing “implementation” monitoring that is required and administered as part of the contract indicated that each of the sampled units within the MVCC Report were within the desired TPA range specified with the Mission Restoration Project EA after accounting for potential mistletoe impacts on residual TPA. The table below compares the results from the Report, the Forest Service’s “confirmation” sample plots, and the Forest Service’s on-going implementation monitoring.

The difference in results due to sampling methods highlights the importance of working collaboratively with our partners to develop a rigorous, consistent, and repeatable monitoring approach for this and other projects in the Okanogan-Wenatchee National Forest. Having a mutually sanctioned monitoring program would ensure that ecological, social, and economic outcomes are met. It is vitally important that we be on the same page if we are to successfully reduce the threat of high-intensity wildfire at a landscape scale.

**Comparison of Sampling Results from MVCC Treatment Report,
Random Samples, and On-going Implementation Monitoring**

Subdivision (acres)	Residual TPA goal from EA [Unit Type / Silvicultural Prescription from EA]	Treatment Monitoring Independent Report (TPA) [Plot(s) Used]	Forest Service Confirmation Plots (TPA) [Plot(s) Used]	FS Implementation Monitoring (TPA) [Plot(s) Used]
Sub 2 (48)	23 to 30 [Warm Dry DFR: 30-40 TPA reduced 25% to 23-30 TPA due to DFMT]	18 [1 plot of 3 acres]	24 [9 plots, 1/10th & ¼- acres nested]	25.3 [12 fixed ¼ acre plots]
Sub 4 (26)	15 to 23 [DFDMT 20-30 TPA reduced 25% to 15-23 TPA]	17 [1 plot of 3 acres]	17 [7 plots, 1/10th & 1/4 nested]	23 [10 fixed ¼ acre plots]
Sub 6 (40)	23 to 30 [Warm Dry DFR: 30-40 TPA reduced 25% to 23-30 TPA due to DFMT]	17 [1 plot of 3 acres]	23 [9 plots, 1/10th & 1/4 nested]	26 [10 fixed ¼ acres plots]
Sub 20 (12)	15 to 23	12 [1 plot of 3 acres]	20	22

Subdivision (acres)	Residual TPA goal from EA [Unit Type / Silvicultural Prescription from EA]	Treatment Monitoring Independent Report (TPA) [Plot(s) Used]	Forest Service Confirmation Plots (TPA) [Plot(s) Used]	FS Implementation Monitoring (TPA) [Plot(s) Used]
	[DFDMT 20-30 TPA reduced 25% to 15-23 TPA]		[5 plots, 1/10th & 1/4 nested]	[4 fixed ¼ acre plots]
Sub 211 (23)	15 to 23 [DFDMT 20-30 TPA reduced 25% to 15-23 TPA]	13 [1 plot of 3 acres]	15 [6 plots, 1/10th & 1/4 nested]	15 [8 fixed ¼ acre plots]

Issue 3

Post-harvest spatial patterns do not reflect the specifications in the EA for ICO (individuals / clumps / openings) (Treatment Monitoring Report, pp. 2, 4-5, Table 1).

Response 3

The EA discusses ICO in detail, and we acknowledge that these treatment objectives were not sufficiently carried forward into the Mission DXP contract. The contract focused on the silvicultural priorities of raising the canopy height, reducing stocking levels, and selecting for the healthiest residual cohort with the goal of returning the *landscape* to a healthy, fire-resilient state. Individuals, small and large clumps, and openings should exist in all harvested subdivisions; however, we agree that their relative abundance and distribution can be improved. Up to this point, the poor health of existing cohorts has made it difficult to ensure that clumps and openings resemble historic patterns while also achieving fuels reduction goals.

The MVCC Report made observations about residual spatial patterns in five of the Mission Restoration Project units. These observations highlight that explicit and thoughtful contract language is needed to ensure that contractors can implement specific spatial patterns at the stand scale. The Forest Service looks forward to working with partners like MVCC to improve the implementation of ICO spatial patterns in upcoming harvest units. Our goal is to arrive at mutually acceptable prescriptions and contract language that incorporates ICO objectives.

Issue 4

Larger trees were not clearly favored (Treatment Monitoring Report, p. 2).

Response 4

For various reasons during harvest operations, large trees (trees greater than 21" and less than 24" DBH) are sometimes chosen for removal over smaller ones. For example, large, healthy ponderosa pine are preferred as leave trees over Douglas-fir. If a large, compromised Douglas-fir is directly competing with a healthy, dominant ponderosa pine or healthy, codominant Douglas-fir, the large, compromised Douglas-fir will be removed to favor the dominant ponderosa pine or smaller Douglas-fir. This treatment, though removing a larger (diseased) tree, is considered a net benefit to stand health into future decades.

Although we did not capture large tree retention within our survey data, large Douglas-fir and ponderosa pine are found throughout the project area. All trees greater than 24" DBH are retained regardless of health and vigor. Given the social and ecological value of large trees, we welcome partner

collaboration in thinking through an approach that would allow us to better track the retention of these trees in treatments as part of our larger restoration strategy on the Okanogan-Wenatchee National Forest.

Conclusion

The MVCC's "Treatment Monitoring Report" – beyond the issues it raises – illustrates the need for a **consistent, repeatable, and rigorous monitoring program that is mutually agreed upon between the partners and the Forest Service**. We suggest this could be achieved with the recently funded North Central Washington Collaborative Forest Landscape Restoration Project (CFLRP), or through the North Central Washington Forest Health Collaborative's third-party monitoring subcommittee. The Forest has a unique opportunity afforded the CFLRP to adopt and widely implement consistent and repeatable monitoring methods to address a range of partner interests. We invite MVCC and other interested partners to take part in the ongoing conversations to develop a 10-year CFLRP monitoring plan. Having a shared monitoring approach would prevent the time, trouble, and miscommunication that would prevent us all from meeting our objective of a healthy forested landscape resilient to high-intensity wildfire.

In summary, the Mission Restoration Decision Notice (DN) has several purposes and needs, one being to "maintain and restore forest vegetation characteristics to within estimated historical and future ranges of variability to improve forest resiliency to insect, disease, and wildfire events" (DN, p. 5). Historically, the forest stands in the Mission Restoration Project would have been much more open, but a legacy of past management practices combined with a century of fire suppression has resulted in a current landscape with much less resiliency to wildfire, insects, and disease (DN, p.5, last bullet). The silvicultural prescriptions in the EA are intended to work in concert to achieve lower densities and open canopies for more resilient conditions across this landscape. For context, the selected alternative (Modified Alternative 2) proposes to treat about 20 percent of the 50,200-acre landscape analyzed (Appendix A, attached). Commercial harvest accounts for only 2 percent (~1,800 acres) of the treatment area.

We highly value our community and cannot understate the role of our engaged partners in ensuring the success of landscape restoration projects across the Okanogan-Wenatchee National Forest. We look forward to continuing to productively engage with MVCC and our other partners to increase the pace, scale, and **quality** of forest restoration work on the Methow Valley Ranger District and Forest more broadly. We encourage anyone with questions to reach out to the Methow Valley Ranger District.

Contributors: Adam McClelland (Forester), Mike Borowski (Timber Sale Administrator), Pete Wier (Forest Silviculturist), Eireann Pederson (Silviculturist), Kerry Kemp (Ecologist), and Meg Trebon (Environmental Coordinator)



Approved by: Julie Bain (District Ranger, Acting)

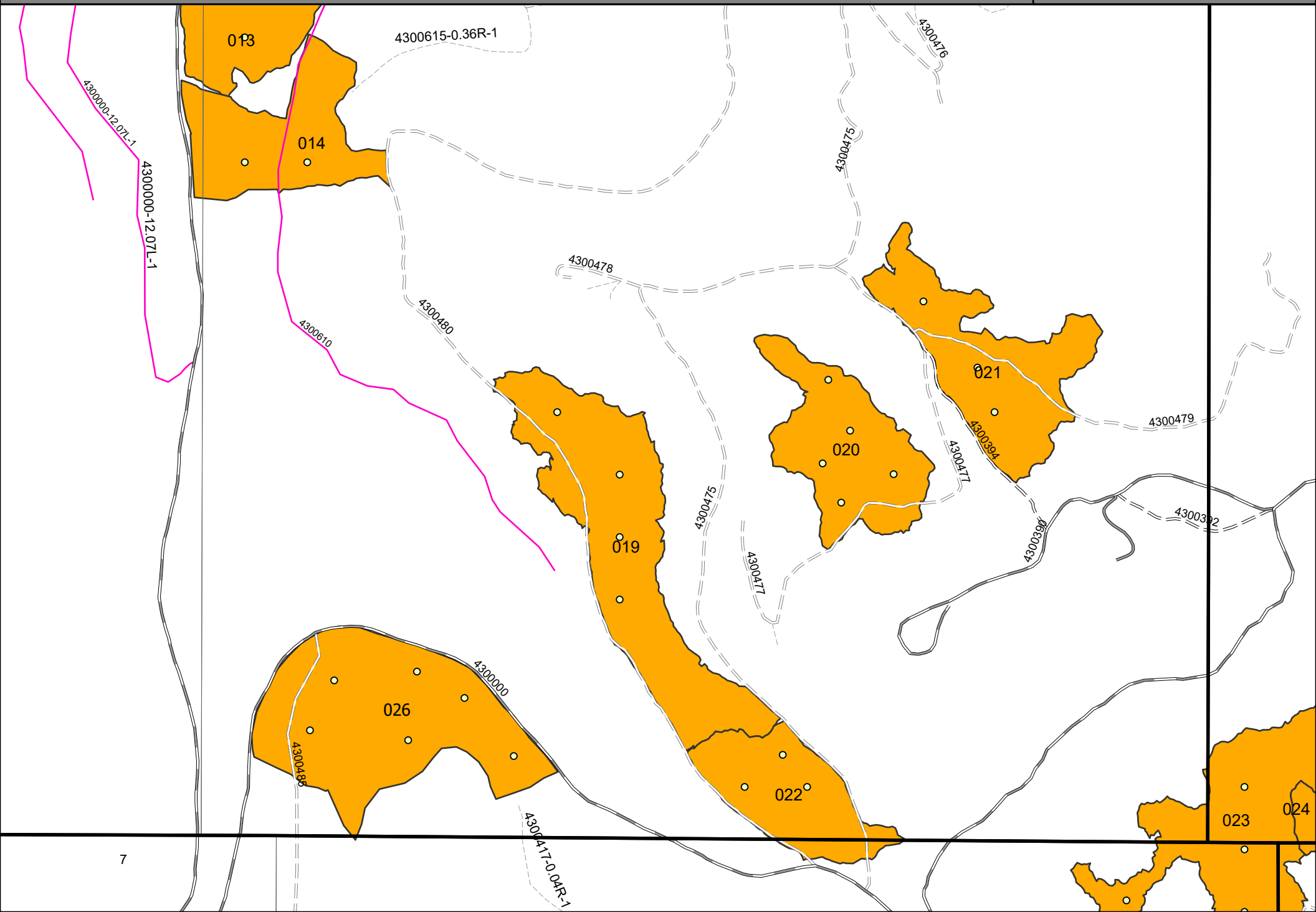
Mission Installed Plots

0 0.05 0.1 0.2 Miles



Legend

-  Mission Plots
-  Mission Sale Units



Appendix A: Proposed Thinning and Prescribed Fire Treatments

This appendix contains parameters and prescriptions applicable to proposed commercial and non-commercial thinning treatments and prescribed fire treatments in the Mission Restoration project area. Proposed thinning and prescribed fire treatment units are displayed in Appendix F. Figure 139 lists the thinning prescription names in alphabetical order, summarizing the thinning and prescribed fire treatments and their relationship to the project’s purpose and needs. A more detailed description of each thinning prescription follows.

Figure 139. Mission Thinning and Prescribed Fire Prescription Summary

Thinning Prescription	Thinning Prescription Summary	Prescribed Fire Prescription ¹	Total Acres	Purpose
Aspen Release Thin (ASPEN) (commercial)	Thin conifers up to 24" DBH with mechanized equipment. Thin remaining trees ≤8" DBH with chainsaws. Prune remaining conifers up to 6'	MP: 0 ac UB: 135 ac HP: 25 ac Landings: 16	160 ac	P&N#3: Vegetation Composition & Structure P&N #5: Sensitive Plants & Unique Habitats. <ul style="list-style-type: none"> Release aspen from conifer encroachment. Stimulate & diversify development of aspen.
Conifer Girdling for Aspen Restoration (CGAR) (Noncommercial)	Thin conifers ≤10" DBH in 15 – 30' circles around aspen trees with chainsaw. Girdle conifers 10 – 21" DBH with chainsaws.	HP: 47 ac UB: 24 ac	71 ac	P&N #5: Sensitive Plants & Unique habitats <ul style="list-style-type: none"> Release aspen from conifer encroachment. Stimulate & diversify development of aspen.
Dry Forest Restoration Thin (DFR) (commercial)	Thin conifers up to 24" DBH with mechanized equipment. Thin remaining trees ≤8" DBH with chainsaws. Prune remaining conifers up to 6'.	MP: 463 ac UB: 817 ac Landings: 128	1280 ac	P&N #1: Hydrologic and Aquatic Restoration P&N #3: Vegetation Composition & Structure P&N #4: Wildlife Habitat P&N#6: Wildfire Hazard in WUI <ul style="list-style-type: none"> Restore structure, composition, and pattern of conifers in frequent fire interval forests. Accelerate growth of and protection of larger trees. Increase stream flow.

Thinning Prescription	Thinning Prescription Summary	Prescribed Fire Prescription ¹	Total Acres	Purpose
Dry Forest Restoration – Dwarf Mistletoe Thin (DFDMT) (commercial)	Thin conifers up to 24" DBH with mechanized equipment. Thin remaining trees ≤8" DBH with chainsaws. Prune remaining conifers up to 6'.	MP: 87 ac UB: 197 ac Landings: 28	284 ac	P&N #3: Vegetation Composition & Structure. <ul style="list-style-type: none"> Restore structure, composition, and pattern of conifers in frequent fire interval forests. Reduce Douglas-fir dwarf mistletoe infection. Accelerate growth of and protection of large trees.
Ladder Fuel Reduction Thin (LFR) (Noncommercial)	Thin conifers ≤ 8" DBH with chainsaws. Thinning would occur in 15 – 30' circles around trees >8" DBH. Prune remaining conifers up to 6'. No felling of trees within IRA (see figure 121).	HP: 1154 ac UB: 5346 ac	6500 ac. outside of commercial thin units	P&N #3: Vegetation Composition & Structure P&N #4: Wildlife Habitat P&N #6: Wildfire Hazard in WUI <ul style="list-style-type: none"> Restore stand structure, composition, and pattern in frequent-fire return interval forests. Accelerate growth of and protect larger trees. Reduce risk of crown fire initiation. Increase public/firefighter safety and suppression options.
Moist Forest Thin (MFT) (commercial)	Thin conifers up to 24" DBH with mechanized equipment. Thin remaining trees ≤ 8" DBH with chainsaws. Prune remaining conifers up to 6'.	MP: 67 ac UB: 3 ac Landings: 7	70 ac	P&N #3: Vegetation Composition & Structure (Units 26 & 27 = 36 acres) P&N #4: Wildlife Habitat (Units 1 & 65 = 34 acres) <ul style="list-style-type: none"> Maintain large trees and structural diversity. Accelerate development of large trees in dense multi-story (NSO) habitat. Reduce risk of crown fire initiation in NSO habitat.
Plantation Thin (TSI) (Noncommercial)	Thin conifers up to 8" DBH ⁴ with a chainsaw. Prune remaining conifers up to 6'	HP: 1653 ac HP & UB: 660 ac MP & UB: 85 ac	1738 ac	P&N #3: Vegetation Composition & Structure; P&N #4: Wildlife Habitat <ul style="list-style-type: none"> Reduce stand density. Accelerate growth of larger trees. (Promote early seral species while maintaining species diversity).

Thinning Prescription	Thinning Prescription Summary	Prescribed Fire Prescription ¹	Total Acres	Purpose
Post and Pole Thin (PP) (Noncommercial)	Thin conifers up to 13" DBH with chainsaws; remove trees by hand (no mechanized equipment – personal use). Thin conifers greater than 2' tall and ≤8" DBH with chainsaws. Thinning would occur in 15 – 30' circles around trees >8" DBH. Prune remaining conifers up to 6'.	UB: 36 ac	36 ac	P&N #3 Vegetation Composition & Structure
Variable Retention Regeneration (VRR) (commercial)	Harvest conifers up to 24" DBH with mechanized equipment. Fell remaining undesirable trees up to 8" DBH with whip felling. Prune remaining conifers up to 6'. Replant post-prescribed fire treatment	UB: 59 ac	59 ac	P&N #3: Vegetation Composition & structure. <ul style="list-style-type: none"> Promote early seral species and regenerate a new cohort of trees in the majority of the unit while maintain components of structural diversity.
Wetland Thin (WT) (Noncommercial)	Thin conifers up to 8" DBH with chainsaws in Black Pine Meadows and Mission Pond	HP:22 ac	22 ac	P&N #4: Wildlife Habitat. P&N #5: Sensitive Plants & Unique Habitats. <ul style="list-style-type: none"> Reduce conifer encroachment in wetlands.

¹ AC = acres; HP = Hand pile and burn piles; UB = Underburn; MP = Machine pile and burn piles; DBH = Diameter at Breast Height

Commercial Thinning Parameters and Prescriptions

General Commercial Thinning Parameters

Proposed commercial harvest treatments would follow the following parameters:

1. Conifers 7 to 9 inches DBH (merchantable diameters for Douglas-fir and ponderosa pine respectively) up to 24 inches diameter at breast height (DBH) would be harvested with the following provisions (except in Riparian reserves as noted below):
 - a. All trees greater than 24 inches DBH would be retained
 - b. Trees 21 inches DBH and larger with an estimated age of 150 years or greater (based on tree appearance criteria described in Van Pelt 2008) would be retained.
 - c. Trees 21 to 24 inches DBH with an estimated age of less than 150 years would occasionally be harvested to release a larger (more preferred species) tree, reduce dwarf mistletoe infection, or reduce conifer encroachment in aspen stands (except in areas with field verified old forest multistory structure located in unit 21) when consistent with treatment objectives.

- d. Thin conifers from below retaining trees among the largest, most vigorous, and most preferred conifer species present to meet treatment objectives.
 - e. Conifer species preference for retention, unless specified otherwise, is as follows in descending order: ponderosa pine, Douglas-fir, Engelmann spruce, lodgepole pine, and subalpine fir (based on fire and insect resiliency).
 - f. Remove all Douglas-fir, subalpine fir and Engelmann spruce less than 21 inches DBH within 50 feet of the last indication of infected trees within root disease pockets.
2. Target numbers and preferred species of leave trees would be applied to site conditions within the harvest unit and would vary based on available merchantable timber volume and plant association group and would be reduced based on root disease and dwarf mistletoe levels. Dominant prescriptions are identified in Figure 141.
 3. Conifers less than merchantable diameter which exceed desired tree density levels and are not needed to meet resource management objectives also would be removed at the time of logging if favorable market conditions exist.
 4. Conifers less than merchantable diameter remaining following harvest which exceed desired tree density levels and are not needed to meet resource management objectives would be felled in a ladder fuel reduction treatment (see Ladder Fuel Reduction thin description below for specifications). Conifers felled post-harvest would be made available for firewood gathering where consistent with fuels management and stand treatment objectives and the current firewood policy.
 5. Harvest treatments when conducted in Riparian Reserves would occur to benefit and restore aquatic resources. Regeneration harvest would not occur in Riparian Reserves. All trees 18 inches DBH and larger would be retained in Riparian Reserves.
 6. Harvest treatments in Riparian Reserves located in harvest units 53 - 57 would be conducted as follows to meet aquatic resource management objectives:
 - a. Twenty to 30 conifers per acre on average would be retained in accordance with the Dry Forest Restoration Thin treatment criteria (described below) to reduce conifer competition with existing deciduous vegetation and promote the establishment of additional deciduous trees and shrubs.
 - b. Harvest would occur an additional 25 feet closer to intermittent stream channels than standard harvest buffer design features described for the project. Ground based harvest equipment would be restricted from operating in the additional 25 feet wide treatment area.
 - c. Riparian Reserve conifers located between intermittent streams and the boundaries of harvest units 53 - 57 would be hand-felled toward the stream to add coarse woody debris into the channel or girdled to retain an average live conifer stocking level of the largest 20 to 30 trees per acre to reduce conifer competition with existing deciduous vegetation and promote the establishment of additional deciduous trees and shrubs. No commercial harvest would occur in this zone.
 7. Harvest treatments would not include the removal of snags, although some may be felled for safety reasons and left on site.

Commercial Thinning Prescriptions

Aspen Release (Aspen) (8 units/ 160 acres total)

Conifers of merchantable diameter would be harvested to release existing aspen trees from conifer encroachment and promote the establishment of aspen and other hardwood regeneration. This treatment would be applied to reduce conifer competition for sunlight and soil moisture, improve the vigor of existing aspen trees, and stimulate sprouting of new aspen stems where conifers have invaded or are shading out aspen clones.

Conifer removal for aspen release treatment would be implemented within existing aspen clones (defined as five or more healthy aspen trees greater than or equal to five feet tall located within a 15 foot radius) and a 50 foot wide buffer located adjacent to aspen clone perimeters. Desired treatment objectives include 10 percent or less canopy closure contributed by conifers following treatment within aspen stands and the adjacent buffer (Shepherd, et al. 2006; Swanson, et al. 2010). Implementation of this objective would be achieved by retaining a maximum stocking level of approximately ten merchantable sized conifers per acre following treatment within aspen stands and the buffer. Ponderosa pine is the preferred conifer species to retain within aspen stands and the adjacent buffer. Douglas-fir and subalpine fir are the least preferred conifer species to retain within aspen stands and the adjacent buffer. The largest conifers of the most preferred species present would be favored for retention. Conifers would be retained in clumps when possible to attain conifer canopy closure objectives. Live defective conifers with favorable characteristics for wildlife habitat would be retained within and adjacent to aspen stands. Douglas-fir and subalpine fir 21 to 24 inches DBH with an estimated age of less than 150 years (based on criteria described in Van Pelt 2008) would be harvested where needed to achieve desired conifer stocking levels except in areas with field verified old forest multistory structure located in unite 21. All conifers larger than 24 inches DBH and 21 to 24 inches DBH with an estimated age of 150 or more years would be retained in aspen clones and the adjacent buffers even if conifer stocking exceeds the desired maximum retention level. No aspen or other deciduous broadleaf trees would be harvested.

Conifer stands within aspen release treatment unit boundaries which are located outside of aspen clones and more than 50 feet away from aspen clone perimeters would be treated with the Dry Forest Restoration Thin (DFR) or Dry Forest Thin with Dwarf Mistletoe Reduction (DFDMT) harvest treatments, which are described below, depending on existing stand conditions.

Non-merchantable conifers remaining following harvest would be felled in aspen clones and adjacent 50 foot wide buffers to reduce competition with existing aspen stems and promote expansion of aspen clones.

Dry Forest Restoration Thin (DFR) (49 units/ 1,280 acres total)

Conifers of merchantable diameter would be harvested to maintain and restore elements of historic forest stand structures including tree density, large and old trees, species composition, and spatial patterns (including tree clumps, individual trees, and canopy openings) to increase stand and landscape resiliency to natural disturbances including forest insect attacks, tree diseases, and wildfires. Desired residual tree density, species composition, and spatial patterns within stands are derived from data collected in reference stands located in the eastern Washington Cascades (Nature Conservancy et al. 2016; Ohlson and Schellhaas. 2002; Ohlson 1996) and previously implemented projects on the Methow Valley Ranger District. This treatment would be applied primarily in densely stocked mixed conifer species or ponderosa

pine stands with single or multiple canopy layers (stem exclusion closed canopy, young forest multistory, or understory re-initiation stand structures) and sufficient numbers of healthy trees in the upper canopy layer to achieve desired density, species composition, and spatial pattern of residual trees. The majority of trees in stands with this proposed treatment are less than 150 years old and large (> 25 inches DBH) and old trees (\geq 150 years) may be nonexistent to relatively abundant. Dwarf mistletoe and root disease may be present in individual trees or small pockets and are not widespread throughout treated stands.

Figure 140 displays the desired range of post-harvest tree density levels of residual merchantable sized conifers and 5 inch DBH or larger aspen trees for proposed dry forest restoration thin harvest units. Anticipated tree mortality caused by post-harvest fuels treatments would be taken into consideration during development of timber marking guidelines to achieve desired live tree density levels. Plant association groups in the Mission analysis area are described in the *Field Guide for Forested Plant Associations of the Wenatchee National Forest* (Lillybridge, et al. 1995). Target numbers of trees to remain will vary within harvest units based on plant association group and would be reduced based on root disease and the presence of dwarf mistletoe.

Figure 140. Mission Desired Tree Stocking Levels in Dry Forest Restoration Thin Harvest Units

Plant Association Group(s)	Approximate average number of trees per acre retained
Hot-dry ponderosa pine and Douglas-fir	20 - 30
Warm-dry and warm-mesic Douglas-fir	30 - 50
Cool-dry Douglas-fir and subalpine fir	40 - 50

The desired spatial pattern or horizontal arrangement of residual trees within stands can best be described in terms of individual trees, tree clumps, and canopy openings (Churchill et al. 2014; Larson and Churchill 2012; Larson et al. 2012). A clump of trees is defined as two or more trees in close enough proximity that a portion of their crowns are interlocking. Approximately 65 percent of residual trees in dry forest restoration thin harvest units would be retained in clumps of various size with a spacing of 20 feet or less between leave tree boles. A leave tree is considered part of a clump if the bole of the tree is located 20 feet or less horizontal distance from at least one other leave tree bole. Approximately 35 percent of residual trees would be retained as individual trees located more than 20 feet away from all other leave trees. To promote an irregular distribution of residual trees, average tree stocking and clump target levels would be achieved over the entire area of a treatment unit rather than on every acre. Canopy openings would be comprised of those areas where the distance between residual tree boles is greater than 3 times the maximum “clumped” tree distance (60 feet). Canopy openings, generally expected to be one third acre in size or less, would occur on approximately 20 percent of treatment areas.

Generally, the largest and most vigorous conifers (with regard to height, bole diameter and live crown volume) of the most preferred species present in a given area would be retained to achieve the target or desired stocking levels and spatial pattern of residual trees. All trees

greater than 24 inches DBH would be retained. All trees 21 inches DBH and larger with an estimated age of 150 years or greater (based on criteria described in Van Pelt 2008) would be retained and vigorous trees would be released from competition with adjacent younger and smaller trees. Live defective trees and dying trees would be retained as needed to provide cavity dependent habitat. Complex patches which include large snags, live defective trees, large and old trees, or large dwarf mistletoe infected trees would be retained. No aspen or other deciduous broadleaf trees would be harvested. Aspen clones one quarter acre and larger in (includes adult trees and suckers) size included within dry forest restoration thin harvest units would receive the previously described Aspen Release (Aspen) harvest treatment (see Aspen Release description below for specifications). Aspen trees of at least 5 inches DBH would count towards individual and clump targets.

Dry Forest Restoration Thin with Dwarf Mistletoe Reduction (DFDMT) (10 units/ 284 acres total)

This treatment is similar to the previously described dry forest restoration thin treatment with an emphasis on reducing Douglas-fir dwarf mistletoe infection levels in treated stands. This treatment would be applied in mixed conifer species stands comprised primarily of trees less than 150 years old with sufficient healthy ponderosa pines, Douglas-firs, and other conifer species to achieve desired density levels in the majority of the stand and moderate to high levels of Douglas-fir dwarf mistletoe infection in other portions of the stand. These stands typically have multiple canopy layers including areas with densely stocked trees, openings, and widely spaced trees. Large (> 25 inches DBH) and old (\geq 150 years) Douglas-fir and ponderosa pines may be present in some stands.

The Dry Forest Restoration Thin harvest treatment would be applied throughout areas that are adequately stocked with vigorous and disease-free trees to meet density, species composition, and spatial pattern treatment objectives. Young and mature trees (with an estimated age of less than 150 years) 20 inches DBH and smaller infected with dwarf mistletoe would be harvested throughout treatment units to achieve dry forest restoration thin tree retention objectives (including heterogeneous spatial patterning of residual trees) and reduce the proportion of infected trees in treated stands. Vigorous trees with low infection levels (dwarf mistletoe infection ratings generally of 2 or less; Hawksworth 1977) would be retained where needed to achieve tree retention objectives. Infected trees 21 to 24 inches DBH with an estimated age of less than 150 years would be harvested on a case by case basis consistent with stand treatment objectives. All trees 21 inches DBH and larger with an estimated age of 150 or more years (based on criteria described in Van Pelt 2008) would be retained and vigorous trees not infected with dwarf mistletoe would be released from competition with adjacent younger trees. Aspen clones one quarter acre and larger in size included within dry forest restoration thin harvest units would receive the previously described Aspen Release (Aspen) harvest treatment.

Treatment objectives include reducing future susceptibility to Douglas-fir dwarf mistletoe infection in treated stands. This includes shifting trees species composition towards ponderosa pine and other conifer species that are not susceptible to Douglas-fir dwarf mistletoe and confining infections in residual trees where possible. Infected trees 21 inches DBH and larger would be retained as isolated individuals or discrete clumps with the removal of smaller Douglas-firs located within 50 feet to reduce the spread of dwarf mistletoe (Schmitt 1997). Removal of suppressed, diseased or dwarf mistletoe susceptible trees may result in post-harvest conifer stocking levels up to approximately 25 percent less than the respective dry forest restoration thin (DFR) desired residual tree stocking numbers displayed above. Canopy

openings larger than two acres created by harvest and post-harvest fuels treatments would be assessed to determine if reforestation with pines or other non-susceptible species is needed to meet treatment objectives.

Moist Forest Thin (MFT) (4 units/ 70 acres total)

Conifers of merchantable diameter would be harvested to maintain or promote the development of large trees and multistory stand structure in two stands totaling an estimated 38 acres (units 1 and 65) currently providing or with potential to provide northern spotted owl habitat. This treatment would be applied primarily in densely stocked mixed conifer stands with multiple canopy layers (young forest multistory stand structure) where the majority of trees are less than 150 years old and large and old trees are present in the overstory canopy layer. Treatment objectives include retaining multistory stand structure while reducing stand density to 60% or greater canopy closure with variable thinning from below to remove smaller subordinate trees which are competing with larger trees present in treated stands. All trees 18 inches DBH and larger would be retained. Areas comprised primarily of trees less than 18 inches DBH would be thinned to retain vigorous trees, reduce but not necessarily eliminate dwarf mistletoe infection, and provide growing space for residual trees to develop into larger trees. The preferred spatial pattern for tree retention would include approximately 70% or greater of trees retained in clumps of variable size comprised primarily of Douglas-firs and 30% or less individual trees. Vigorous old ponderosa pine trees 21 inches DBH and larger with an estimated age of 150 years or greater (based on criteria described in Van Pelt 2008) would be treated with release felling to remove trees less than 18 inches DBH with crowns located within the pine tree canopy dripline. Trees growing within the canopy dripline of declining pines (less than 30% live crown ratio) 21 inches DBH and larger would be retained to promote clump development around future snag recruits. Complex patches which include large snags, live defective trees, large and old trees, or large dwarf mistletoe infected trees would be retained. Canopy openings created by tree removal would be limited to one quarter acre and smaller in size.

Conifers of merchantable diameter would be harvested to reduce subalpine fir/Engelmann spruce forest cover and promote Douglas-fir and lodgepole pine forest cover in two stands totaling an estimated 37 acres (units 26 and 27). This treatment would be applied in mesic and dry mixed conifer stands stocked with subalpine fir, Engelmann spruce, Douglas-fir, and lodgepole pine trees in multiple canopy layers (young forest multistory stand structure). Portions of these stands have experienced lodgepole pine mortality caused by mountain pine beetle attacks. With the exception of subalpine fir, the largest and most vigorous conifers (with regard to height, bole diameter and live crown volume) of the most preferred species present would be retained in clumps of various sizes to achieve the target or desired residual stocking level of approximately 40 to 50 trees per acre. Tree species retention preference in descending order is Douglas-fir followed by ponderosa pine, Engelmann spruce and lodgepole pine. Standing dead and down lodgepole pines in excess of snag and large woody debris retention objectives would be removed for firewood or other forest products. All trees greater than 24 inches DBH and all trees 21 inches DBH and larger with an estimated age of 150 years or greater (based on criteria described in Van Pelt 2008) would be retained. Live defective trees and dying trees would be retained as needed to provide cavity dependent habitat. Complex patches which include large snags, live defective trees, large and old trees, or large dwarf mistletoe infected trees would be retained. No aspen or other deciduous broadleaf trees would be harvested. Aspen clones one quarter acre and larger in size included within harvest units 26