Blue Mountains Biodiversity Project Comments on the Tiger-Mill Project Proposed Action

To: Walla Walla Ranger District, District Ranger, Attn: Joseph Sciarrino
1415 W. Rose St., Walla Walla, WA 99362

From: Austin Starnes, Staff Attorney, on behalf of Paula Hood and Karen Coulter, Co-Directors,
Blue Mountains Biodiversity Project
27803 Williams Lane, Fossil, OR 97830 - (541) 385-9167

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Procedural Overview:

This Proposed Action does not incorporate any detailed, in-depth analysis required by the National Environmental Policy Act (NEPA). Thus this "Proposed Action" document cannot be used as the only NEPA document available for public comment. A full range of alternatives is also required by NEPA for public comments, which is not included in the Proposed Action document. Given that commercial logging is planned for within two Municipal Watersheds and an Inventoried Roadless Area, an Environmental Impact Statement should be required and prepared, with a full 45-day comment period for the EIS, and a later 45-day period in which to file objections.

The National Forest Management Act requires ensuring the viability of Management Indicator species for the National Forest being affected and also requires consistency with Forest Plan standards, and guidelines, which is not done within this "Proposed Action" document. This would need to be accomplished through detailed, in-depth analysis under NEPA, with a full opportunity for public comment on the analysis. The Clean Water Act requirements must also be met—especially as commercial logging, non-commercial thinning, prescribed burning, and "temporary" road construction are all planned for a Municipal Watersheds. Consistency with both the Clean Water Act and the Endangered Species Act would have to be determined by detailed, in-depth analysis, with an opportunity to comment on the Environmental Impact Statement with at least a 45-day comment period.

Key Issues for Detailed, In-depth Analysis in a Necessary Environmental Impact Statement:

Key issues for detailed, in-depth analysis for the Tiger-Mill Project includes analysis for effects to all of the following: water quality; fish species including Threatened Bull trout, Sensitive Redband trout, and historic Mid-Columbia Steelhead trout and Chinook salmon and effects to their potential restoration in the watersheds; other aquatic and riparian species such as Columbia spotted frog, Sensitive-listed mussels, and any salamander species; Endangered, Threatened, Sensitive-listed species, and Candidate species for up-listing, including Gray wolf, Canada lynx, Pacific fisher, Bull trout, Redband trout, and any TESC-listed plant species; soil integrity and productivity; Riparian Habitat Conservation Areas (RHCAs) and effects to achieving PACFISH/INFISH Riparian Management Objectives for the RHCAs; indigenous people's cultural sites and artifacts, as well as customary uses and treaty rights; effects to the Inventoried Roadless Area values; Municipal Watershed values; Undeveloped lands; large tree structure; old growth habitat; recreational values; and forest carbon sequestration and carbon

storage to reduce or slow the effects of extreme climate change. Other issues such as effects to air quality should also be analyzed with detailed, in-depth analysis.

Blue Mountains Biodiversity Project Proposed Alternatives:

We recommend and request consideration and detailed, in-depth analysis of the following action alternatives and a "No Action" alternative in an Environmental Impact Statement to help fulfill the requirements to provide a full range of alternatives and to use in-depth, detailed analysis to address public concerns and devise a more ecologically protective proposed action alternative:

We prefer the No Action alternative, but could also accept the following recommended action alternative: an alternative that does not include any commercial logging, but provides for non-commercial small tree thinning up to 10" dbh maximum along major access roads and in previously logged sale units if needed, with no management inside the Inventoried Roadless Areas (IRAs) and Municipal Watersheds. This action alternative would also include prescribed burning only in lower elevation, dry forest types outside of the IRA and the Municipal Watersheds. This alternative would not include and "temporary" road construction or re-construction of closed or decommissioned roads. This is our preferred action alternative, second to our preference for the No Action alternative.

Another possible action alternative that should be analyzed for a full range of alternatives, although not our preferred alternative, would have no commercial logging in the IRA, Municipal Watersheds, and any other never-logged areas. Some of the following Management Areas where there would be no commercial logging include Management Areas that may have never been logged, including within C3 Big Game Winter Range, C1 Dedicated Old Growth, the D2 Research Natural Area, C5 Riparian areas, and the aforementioned F2 Mill Creek Municipal Watershed, the F4 Walla Walla Municipal Watershed, and the Mill Creek and Walla Walla Inventoried Roadless Areas. Other Management Areas that would be excluded from commercial logging, based on guidelines and standards for these Management areas include the A9 Special Interest Area, C4 Wildlife Habitat, and A3 Viewshed 1. This alternative would include non-commercial thinning only in previously logged areas accessible by existing roads outside of the IRAs and Municipal Watersheds. This alternative would include prescribed burning only in dry forest types outside of the IRAs and the Municipal Watersheds. This suggested action alternative would also have no "temporary" road construction or reconstruction of closed roads.

Project Overview:

The Municipal Watersheds should not be logged or have any "temporary" road construction or reconstruction of closed or decommissioned roads. These municipal watersheds were originally set aside from logging and roading to protect water quality and provide for an abundant drinking water supply. Forest managers of that time recognized the enormous threats that logging would have to drinking water supplies. This reality has not changed.

In 1918, the city of Walla Walla and the Secretary of Agriculture entered into an agreement meant to protect and conserve the city's watershed, which will be adversely impacted by this

proposed action. This agreement has been incorporated into the 1990 Umatilla National Forest Land and Resource Management Plan. See PA p. 5. According to the Umatilla Forest Plan, "[a]ctions that *could* degrade water quality are either prohibited or are subject to approval by the respective city." Umatilla LRMP at 114 (emphasis added). This prohibition on actions that degrade water quality does not require a guarantee of such degradation, simply a possibility. Moreover, it is not clear from the Notice of Proposed Action that the city of Walla Walla has approved the actions proposed in the Notice. This is a requirement for the implementation of the actions within the Municipal Watershed that this Notice proposes. Although the Notice does make mention of a joint news release with the city, we could find no evidence of anything indicating the ci'y's approval of these destructive management practices on the Project's webpage, and certainly not within the Notice we are commenting on here. As of now, it appears that the proposed Tiger-Mill Project is inconsistent with Umatilla Forest Plan, and therefore illegal. As discussed in these comments, not only is it possible that the proposed actions could degrade the watershed's water quality, it is almost guaranteed if the actions are implemented as proposed.

"Eighty-five to ninety percent of the drinking water supplied by the city of Walla Walla comes from the municipal watershed." (Proposed Action, aka PA p. 2). This is a good reason not to log the municipal watershed. Many other municipalities have reached this conclusion—even during periods of intense logging, including clearcutting (which is proposed in this Tiger-Mill timber sale) in the rest of the Forest. Most municipal watersheds have long been protected from logging and roading and still are, as the original concerns are still valid.

"Fire is a natural process that can benefit natural ecosystems. Whether it's caused by lightning or people, and its effects should be anticipated on the landscape." ((sic) PA p. 2, last sentences) We agree and interpret this to mean that wild fires should be allowed to burn in the back country, such as within Inventoried Roadless Areas, Municipal Watersheds, and in Forest areas far away from towns, including in high elevation moist mixed conifer forest. Our interpretation of these statements also includes that, since fire is a natural process that benefits ecosystems(which is a broad consensus of the best available science) wild fires should not be suppressed away from immediate threats to communities, and back country fires should be allowed to burn and potentially be managed.

Further, not suppressing back country wild fires should include not implementing "hazardous fuel reduction" or "fire risk reduction" management in back country parts of the Forests. Commercial logging and road construction and re-construction are particularly destructive to natural wild fire effects and benefits. Funds for wild fire risk reduction projects should be reserved for immediate risk reduction immediately around communities.

The perceived wild fire "risk" is a social concern, not an ecological problem. Thus we are opposed to commercial logging and road construction and re-construction (standard timber sale practices) in the back country.These practices, if successfully implemented, have the effect of suppressing wild fire, and if ineffective (which is usually the case) have the effect of disrupting natural ecological processes and diminishing biodiversity, as well as removing mature and large

tree wildlife habitat structure and greatly reducing carbon sequestration and storage needed to reduce the effects of extreme climate change.

Commercial logging actually increases the severity and extent of wild fires by logging mature and large trees most resistant to fire, increasing wind speeds through the stands, drying up moister forests, and leaving highly flammable slash. It is then followed by in-growth of dense, spindly young, small tree thickets—especially when all or parts of the overstory are removed.

Re: the statement in the PA that "This project would increase forest resilience in the face of drought and other climate change(s) and help protect natural and social resources on the Forest. Delaying these treatments would result in further build-up of hazardous fuels and an increased risk of adverse impacts to the municipal watershed." (PA, p. 3). There is no clear statement identifying the purpose and need for the Tiger-Mill project, which should be identified and open to a public comment period of 30 days for an EA, or 45 days for an EIS, which we think is required for this timber sale "project." The above quote is the closest statement we could find in the PA that might express the purpose and need for the project, and it is not even included in the stated Purpose and Need section.

Our response to the quoted PA statement in the preceding paragraph: Commercial logging, such as that planned for the Tiger-Mill timber sale "project" (aka "sale") often destroys "natural and social resources"—such as wildlife habitat; plant biodiversity; soil integrity; suitable fish habitat; water quality; recreational values, including elk and deer hunting; and scenic values—rather than protecting them, as claimed on p. 3 of the PA.

Commercial logging and large tree removal pose "an increased risk of adverse impacts to the municipal water supply" much more than a "further build-up of [so-called] hazardous fuels" (biomass), otherwise known as trees, snags, and logs, which are essential wildlife habitat structure.

Location and Background:

When we field surveyed the proposed Tiger-Webb timber sale in the IRA, which overlaps part of the Tiger-Mill project area, we observed great expanses of natural openings, particularly on southern slopes, as would be expected, and extremely steep slopes with very little top soil on these open expanses that made hiking perilous due to lack of good footing and long drop-offs. These serve as natural fuel breaks between the municipal watersheds/IRAs and much lower elevation communities and areas used by recreationists. On north slopes and near creeks, the forest was lush with plant diversity, high moisture retention, and tree species adapted to moister conditions and ash soils, such as Grand fir and Engelmann spruce, as well as Western larch. We observed never-logged forest away from the roads in the IRA. We also enjoyed the impressive old growth habitat in a mosaic of openings, with ridgeline old growth Douglas fir, and northern slopes and creek or stream areas with moist mixed conifer tree species composition, including old growth Grand fir, and old growth Western larch. I think there was also Engelmann spruce on near creeks. We have field survey sheets and photographs from our field surveying of the proposed Tiger-Webb sale as evidence of existing conditions in the area, although they are not immediately accessible as I recount our experiences in these comments. We also submitted

public comment on the Tiger-Webb project and, given the overlap in geographical area between these projects, hope the Forest Service reviews those previous comments as well. The denser moist forest we hiked through still had variable density with only patchy small trees. We had no difficulty walking through the stands.

Overall, our experience in that part of the IRA did not indicate any need for logging to reduce risk to communities or recreationists, as there were already logged fuel breaks near the roads where we and others camped and big natural openings providing fuel breaks between the lower and higher elevation forest and between the southern and northern aspect dry and moist forest, divided by fairly open ridgelines with patchy old growth Douglas fir and Ponderosa pine.

Three of us, myself and two friends (Sophie and Jeffrie) who were volunteering to survey with us, took an unnecessarily long route to some sale units on a ridgeline that were relatively close to a road by comparison. Instead of a half hour hike to the sale units along the ridgeline, we started off in the moist mixed conifer forest at the bottom of the slope and enjoyed what was a very recreational day-long hike to the sale units on the ridge line and back again. Although the very steep slopes going up to the ridgeline were scrambly, difficult, and exhausting, with no sign of the hiking trail on our map, we had a good time exploring more of the roadless area. We crossed a creek, observed big old growth snags and logs and well as big live old growth trees, explored both moist mixed conifer and dry forest, and crossed large, steep natural openings. We enjoyed wild flowers, found unusual plants, and enjoyed high elevation scenic views from which we could see very far. Most of this hike was purely recreational, with a much shorter amount of this time being spent field surveying the sale units on the ridgeline, which were fairly small. We split up to survey them and then met up for the long hike back down to my truck at the starting point. We agreed that the hike, although parts could be considered a "death march" in the hot sun on extremely steep, scrambly slopes, was a memory we would fondly tell our friends and family. It was a bonding experience.

That hike brought to my attention just how extremely steep the slopes in the IRA are, which are likely characteristic of other slopes in the IRA and the municipal watersheds in the Tiger-Mill project area. We are very concerned about the negative effects of logging on steep slopes in the Tiger-Mill project area. This concern is justified by information in the Proposed Action that "62 percent of the area is composed of slopes greater than 50 percent" and only "about 16 percent has less than 35 percent slope" (PA p. 3).

30 to 35% slope usually triggers the need for commercial logging to switch to much more expensive and dangerous methods of logging, including cable yarding and extremely expensive helicopter logging, which are both planned. We are concerned that the use of yarding and even more dangerous tethered cable logging, as well as very expensive helicopter logging, would result in a lot of large tree logging.

We are concerned that large trees across the Blue Mountains Forests only constitute about 3-4% of the entire Forests in the Blue Mountains, an extreme deficit in large tree structure compared to historic conditions. (See David Mildrexler's study). Logging more large trees would increase the great deficit in large tree structure even though more large trees are badly

needed for wildlife habitat structure, fisheries, meeting RHCA Riparian Management Objectives (RMOs), recreational and scenic values, old growth habitat, and serving as the greatest source of forest carbon sequestration and storage needed to slow or reduce extreme global warming effects.

Logging large trees inevitably leads to logging old growth trees as well. The 21" dbh limit for logging in the Eastside Screens is based on the statistically defined average size that indicates a Ponderosa pine that is at least 150 years old, the current definition of old growth for the Blue Mountains National Forests. Since the Forest Service has been assuming that Grand fir and Douglas fir grow faster than Ponderosa pine and that are thus not necessarily old growth at 21" dbh, the Deschutes NF Bend-Fort Rock Ranger District staff cored a number of Grand firs in the Ursus sale to determine the size at which Grand fir tend to be at least 150 years old—old growth. Their results from coring showed that Grand firs were mostly 150 years old or older—old growth—at 22" dbh, only one inch more than the 21" dbh limit.

The scientists who devised the Van Pelt guidelines for visual characteristics in trees that indicate old growth status acknowledged that these visual characteristics to determine old growth status are not reliable for determining which firs are old growth.

Thus, we are actively opposing the 2021 amendment to the Eastside Screens that consider only Grand firs that are ≥30" dbh to be "large" and turn the 21" dbh limit for all other tree species into only a voluntary guideline for not logging large trees, with multiple exceptions. There is ongoing litigation challenging the 2021 amendment allowing greatly increased, and potentially unrestricted logging of large trees on a landscape scale. We strongly oppose any logging of large trees of any species ≥21" dbh in the Tiger-Mill timber sale.

We are also greatly concerned about the negative effects of logging on steep slopes—especially when 62% of the area is composed of slopes greater than 50% and only about 16% has slopes less than 35% —which indicates a great deal of logging on steep slopes, as can be seen on the PA maps. Most of the logging would be on steep slopes. Cable yarding leaves in its wake long-term or permanent scars that often fail to regenerate and which prevent re-growth of contiguous forest cover, creating unimpeded pathways down slope for landslides. Landslides and soil displacement from logging steep slopes introduces excess fine sediment into streams and creeks, impairing water quality and threatening fish, including Sensitive Redband trout and Threatened Bull trout in this sale area.

Steep slope logging on moist mixed conifer slopes is likely to displace irreplaceable ash top soils, which are only created by tremendous volcanic eruptions, in this case the Mount Mazama eruption that created Crater Lake about 7,000 years ago. Ash soils are easily displaced and more ash soil creation is dependent on massive eruptions on geologic time scales. Ash soils are also particularly productive and retain water better than most other soil types. Loss of this water-retaining, productive ash top soil through logging displacement would introduce fine ash sediment into downslope creeks, impairing fish habitat and adversely affecting listed fish species' viability.

When plant communities are 35% Grand fir dominant (usually on ash soils), 19% mixed conifer (likely moist), 13% Douglas fir, 2% Subalpine fir, and only 2% Ponderosa pine (see PA p. 3, last par.) this is a predominantly moist forest with high water retention beneficial to ensuring an abundant municipal water supply, not dry forest that is naturally more open, though there are plenty of openings with little to no forest cover on south aspect slopes. This contradicts the perceived "need" to open up the forest to reduce fire intensity, since the denser moist mixed conifer forest cover is needed to retain moisture contributing to an abundant water supply with high water quality.

I witnessed the McCache wild fire on the Deschutes National Forest having very high intensity stand replacement fire rip through clearcuts and pine plantations designed with wide spacing for fire "risk" reduction, then drop down at the edge of the moist mixed conifer and have only small spot fires within the moist mixed conifer forest. These small spot fire openings are characteristic for moist mixed conifer forest wild fire, creating habitat niche openings.

85-150 square feet of basal area is not that dense. (See PA p. 4, 1st par.). Often on the Malheur National Forest and other Forests, mixed conifer is targeted to be thinned down to about 80 square feet of basal area per acre—which we consider too low for mixed conifer. Actually, logging to low basal areas and/or logging of overstory canopy (mature and large trees) is a driver in ongoing tree mortality (and removal) along with global warming heat waves and drought. Commercial logging of the overstory is a greater cause of ladder "fuel" small tree growth than water stress, along with wild fire suppression. (See p. 4, 1st par.)

Eastside Screens:

We also covered Eastside Screen 2021 amendment concerns on the prior page 5 of our comments.

We are strongly opposed to the 2021 amendment to the Eastside Screens that allows renewed large tree logging and inevitable old tree logging. See our prior comments for more detail. The 2021 amendment is currently under litigation. There is no sound ecological science that supports large tree logging, and the 2021 amendment document failed to make a scientific case for large tree logging, including for Grand fir only being considered large now at 30" dbh, an arbitrary change from 21" dbh. The large tree logging restriction becoming only a voluntary guideline rather than an enforceable standard opens the way for a barrage of large tree logging on a landscape scale across six National Forests in the region. The old growth visual characteristic restrictions will not prevent old growth trees from being logged, as discussed in our comments on p. 5. The best available science consensus is overwhelmingly in favor of protecting large and/or old trees from logging.

Historical Range of Variability (HRV) is an outdated concept, given the rapidly changing conditions from climate change effects. A newsletter from the Pacific Northwest Research Station highlighted this reality, based on the science, yet the Forest Service as an institution is very slow in adapting to changing conditions and using the findings of more recent best available science. HRV is also a misused concept, with the baseline for comparison often being set after periods of heavy logging (e.g. about 1927 for a Malheur timber sale) rather than prior to

European colonization, the required historical baseline. There is also the problem of from where the historic evidence for a very open historic forest was derived. Purported evidence of historical very open forest conditions is often from photographs or early surveys in low elevation, dry Ponderosa pine forest not representative of higher elevation moist mixed conifer forest, such as within the IRAs/Municipal Watersheds within the Tiger-Mill project area. There is also the exposure of a historic photograph from Montana that the Forest Service often used to show an open old growth Ponderosa pine stand as evidence that the Forests should be returned to that open condition. However, when examined closely, there are stumps throughout the stand, that is also being traversed by pioneers with horses.

In the discussion of Eastside Screens Scenarios A and B, on p. 4, 3rd par., assumed HRV ranges are being used to justify logging of already greatly diminished numbers of large trees, based on the Forest scale. Large trees only constitute about 3-4% of the Blue Mountains National Forests, due to past over-logging of large and old trees. There's very little intact old growth forest habitat left.

Wildlife and Fish:

This section contains no detailed, in-depth analysis for effects to wildlife and fish species. This short cursory two paragraphs cannot be substituted for detailed, in-depth analysis of effects to wildlife and fish species. These species need to be considered individually for direct, indirect, and cumulative effects. With no disclosure of in-depth, species-specific analysis for effects, this Proposed Action document cannot be used as the only opportunity for public comments. An EIS is needed for this timber sale.

The Tiger-Mill planning area has more large and old trees and old growth forest due to the IRAs/Municipal Watersheds never having been logged, along with areas not accessible by roads in the area, such as in Big Game Winter Range, and other Management Areas that are usually off limits to logging, including Dedicated Old Growth, Research Natural Areas, and Riparian Habitat Conservation Areas. Never logged areas in the Tiger-Mill project area should not be logged. The Tiger-Mill timber sale appears to be a logging grab for logging never-logged areas with large and old trees that are usually off limits, rather than only a fire risk reduction plan to benefit the Municipal Watersheds. Just because an area has more never-logged stands and more large and old trees does not mean that it should be logged. There are usually sound reasons based on science for these areas not having been logged already, which is the case with the Tiger-Mill sale area.

The Tiger-Mill project area should not be commercially logged—especially not in forest that has never been logged and/or never roaded. Commercial logging creates the conditions for higher density in-growth of smaller, more flammable young trees. Never logged areas tend to have more variable density and openings created by self-thinning due to insects, root disease, or past wild fires. Old growth stands—even in moist mixed conifer—tend to be more open stands due to the larger crowns of old growth trees and the creation of old growth snags and logs spacing out the smaller live trees. On a landscape or Forest-wide scale, there is far too much

acreage of young trees regenerating from past logging and open forest habitat types compared to historic conditions that had far more large tree and old growth forest habitat abundance.

There are very few aquatic refugia habitats where Bull trout still persist. Bull trout habitat needs to be fully protected from logging impacts in the Municipal Watersheds/IRAs and within its historic habitat range. The Forest Service certainly shouldn't be logging on very steep slopes over stream tributaries and Mill Creek when there are ongoing efforts to restore Chinook salmon in Mill Creek. Likewise, historic Steelhead trout should be restored to their historic range and the Mill Creek and Walla Walla Municipal Watersheds and IRAs. Commercial logging on steep slopes above fish-bearing creeks and tributary streams would foreseeably degrade downslope and downstream fish habitat for Threatened-listed Bull trout and Sensitive and MIS Redband trout and make restoration of historic Steelhead trout and Chinook salmon runs far more difficult, if not impossible.

There should be a formal assessment of post-2020 flood effects to habitat conditions for fish to inform detailed, in-depth analysis of current conditions for an EIS and public comment on the EIS.

"Other streams tributary to Mill Creek (Tiger, West Tiger, China, Webb, Henry Creeks) have degraded habitat and floodplain function because of legacy roads and past timber harvest that have resulted in unnatural channel incision and reduction of habitat complexity and these streams continue to be at risk from high flow effects. The upper portions of the Burnt Fork and the Green Fork of the Touchet River are neither as cold nor as un-impacted by human activities as Mill Creek and its tributaries. Historically these streams hosted the same fish species as Mill Creek….Bull trout are less common in these streams, probably because the water is not as cold as Mill Creek." (PA p. 5, 1st par.) So what makes the Forest Service think that doing similar logging (clearcutting, removing large trees, steep slope logging, and re-opening and reconstructing closed or decommissioned roads, along with logging within RHCA buffers) would lead to different results than described for other streams tributary to Mill Creek that have had past timber "harvest" and legacy roads, which now have "degraded habitat and flood plain function" and warmer water temperatures in the streams as a consequence? It is folly to assume that repeating destructive management that impaired riparian conditions, floodplain function, and water temperature in the streams would have different results. This could explain why this timber sale is being expedited at the expense of detailed, in-depth analysis and public response to in-depth analysis of effects to water quality, riparian conditions, and fish habitat, among many other Forest values.

Logging and road construction and use are probably the main causes of warmer water temperatures and impaired riparian conditions for "upper portions of the Burnt Fork and the Green Fork of the Touchet River" and the main causes of loss of historic Chinook salmon and Bull trout. Why destroy the Mill Creek watershed through similar destructive logging and road construction and re-construction? Apparently the Mill Creek watershed is one of the last strongholds for Bull trout, which makes it an ideal place to restore historic Chinook salmon and Steelhead trout runs.

Hydrology:

There is no detailed or in-depth analysis of effects of proposed management to hydrology in the Tiger-Mill project area in this section (or elsewhere) in the Proposed Action document.

It is notable that higher elevations have up to 70 inches of precipitation versus only up to 40 inches of annual precipitation at lower elevations. This means that the higher elevations are likely moist mixed conifer, high water retention forest cover, with longer retention of greater snowpack.

Recreation:

There are only two sentences describing recreational use of the area, which do show that: "The project area is one of the closest access points for people living in the Walla Walla Valley. The area provides non-motorized and motorized trail use, dispersed camping, hunting, foraging, and views of Northern Blue Mountain landscapes and beyond." (PA p. 5). Yet, there is no disclosure or analysis of potential effects of proposed logging, roading, and other management to recreational use of the area and recreational values. The public should be allowed to comment on effects of the timber sale "project" to recreational values and uses.

Mill Creek Watershed Roadless Area:

The history of the Mill Creek Watershed Inventoried Roadless Area indicates it has never been logged, as the Municipal Watershed designation was intended to protect water quality and supply. Logging the municipal watershed would be a dramatic and unwise shift from protecting the water supply by not logging the municipal watershed.

Commercial logging planned in the IRA would not just cut "generally small diameter timber" as mature trees would be logged, and probably large trees as well, neither of which is "generally small diameter". Commercial logging in the IRA would not improve or maintain roadless area values, as required, in violation of the Roadless Area Rule.

"Tiger-Mill is NOT proposing … the removal of trees over 21 inches within Roadless Area. PA p. 6. However, logging up to 21" dbh is by definition not logging "generally small diameter" trees, as there is a mature class of trees smaller than 21" dbh, which could be considered those 15-21" dbh. Small trees are often characterized by non-commercially thinning limits of less than 9-10" dbh. Commercial logging in the Mill Creek Municipal Watershed IRA would violate the Roadless Area Rule.

Commercial logging in the IRA would not improve habitat for Endangered, Threatened, Proposed, and Sensitive species, and would not restore ecosystem and function, as it is unlogged and does not need restoration to restore functions after management damage. It would also not reduce the likelihood of "uncharacteristic" wild fire, as the existing condition is likely burnt in a natural mosaic, with higher elevations sustaining patchy stand replacement fire, as it did historically. None of the listed conditions for logging in an Inventoried Roadless Area on PA p. 6 would be met by the Tiger-Mill proposed action. The area hasn't been logged previously—at least not away from limited access roads. The timber "harvest" would not be "incidental" to

other management and the timber "harvest" is not "needed and appropriate for personal or administrative use."

Umatilla Forest Plan Standards and Guides:

The public needs the opportunity to be able to comment on an EIS detailed analysis that would determine whether there is consistency with the Forest Plan.

BMBP would like the Forest Service to drop all commercial logging of mature and large tree felling in the following Management Areas, based on the MA standards and guidelines: A3 Viewshed 1; A9 Special Interest Area; C1 Dedicated Old Growth; C3 Big Game Winter Range; C4 Wildlife Habitat; C5 Riparian (Fish and Wildlife); D2 Research Natural Area; F2 Mill Creek Municipal Watershed—Undeveloped; and F4 Walla Walla River Watershed. See Table 1 on PA pages 6-7 for summaries of the guidelines for these Management Areas.

BMBP also does not want the Forest Service to create barren clearcuts in the name of so-called "Defensible Fuel Profile Zones"—as was the case in the Upper Pataha CE timber sale adjacent to the South George sale units which were clearcut on the Pomeroy District of the Umatilla NF. These DFPZs also violate Forest Plan standards for "Viewshed" A3 and A4 Management Areas.

The Tiger-Mill timber sale "project" requires preparation of a full EIS with a 45-day comment period because there is significant scientific controversy (as well as public controversy) over commercial logging in an IRA, commercial logging in Municipal Watersheds, and logging large trees ≥21" dbh. There was tremendous public support for no commercial logging or roading in Inventoried Roadless Areas in about 300,000 comments submitted. Municipal Watersheds are usually protected completely from commercial logging, with public support. There is also ongoing litigation against logging large trees under the 2021 amendment of the Eastside Screens.

Commercial logging is well known to threaten water quality and the safety of the water supply, which needs to be retained through the retention of moist mixed conifer forest cover, not reduction of forest cover. We are strongly opposed to any commercial logging and roading within RHCAs.

Purpose and Need:

The proposed actions of clearcutting, heavy logging, large tree removal, and logging in the IRA and the Municipal Watershed are contrary to the apparent purpose and need described for the proposed action, which isn't clarified until p.7. Heavy logging and steep slope logging could substantially change the level of water discharge, which is prohibited for the Walla Walla River Watershed.

It's questionable whether there is really a "need" to reduce so-called "hazardous fuels", which in practice include live, healthy mature trees, snags, and logs critical for wildlife habitat structure and carbon sequestration and carbon storage. Commercial logging tends to homogenize the forest, reducing it to mostly timber industry-preferred tree species and reducing the age and size of trees overall. Therefore, it is unlikely that the proposed action would result in enhancing

diversity in vegetation, as claimed in the stated need for the project. There is a stated need to protect water quality, which is best done by leaving the Municipal Watershed and IRA forest intact. With logging, it is easily foreseeable that the water quality would be degraded, based on past experience and best available current science, including the sound science behind the specified PACFISH/INFISH RHCA buffers.

Purpose & Need 1:

This purpose stated for the project is misleading, as managing the spread of wild fire safely could be impossible—especially under extreme climate change conditions. Prescribed fire and non-commercial thinning around, but outside of, the IRA and the Municipal Watershed and along access roads could make sense, but not commercial logging within the Municipal Watershed and the IRA, which are both likely to have more moist mixed conifer water retention and naturally denser in-growth of small trees, with a long natural fire return interval. Such commercial logging does not manage stands "for resilience to future disturbances" or reduce wild fire intensity or "risk"—especially with logging mature and large trees or clearcutting, but instead reduces forest resilience by removing mature and large trees more resistant to fire and creating very flammable ground-level slash and in-growth of very flammable dense, spindly, small tree thickets.

Re: Figure 2 on p. 7: the "Pre-treatment" goals illustration looks likes a natural forest with good wildlife habitat. The "Post-treatment" condition illustration looks like a sterile, young even-aged plantation with artificially widely spaced trees—a homogenous condition that leaves the stand virtually biologically sterile. We are opposed to continued plantation creation justified as fire "risk" reduction. So the risks of presumed fire "risk" reduction must be weighed against dubious benefits, since widely spaced young trees tend to burn intensely, with fewer mature, more fire resistant trees, higher wind speeds through the stand intensifying the fire effects, and more flammable slash to feed the fire.

Since the ostensible purpose and need for this project is to reduce fire hazard to the municipal watershed, why is virtually unrestricted large and old tree logging planned under the 2021 Eastside Screens amendment, when the PA acknowledges that: "Fire behavior is reduced by decreasing surface fuels, ladder fuels, crown density [removing crown density actually can increase wind speeds, reduce shading that cools the micro-climate, and remove mature and large trees more resistant to fire] and retaining large trees." (PA p. 8, emphasis ours). Logging large trees (and for that matter, overstory trees and water-retaining forest cover) is inconsistent with the stated purpose and need for the project.

Why would "reduced height to live crown" (Figure 2, p. 7) be desired as a goal for fuel breaks when old growth trees have higher fire resistance due to increased height to live crown? This makes no sense. I've never seen this goal before for fuel breaks. The only explanation seems to be using this as a rationale to log large/old trees in fuel breaks. We are strongly opposed to logging overstory trees and large and old trees—including under the deceptive guise of fire hazard reduction.

We are opposed to logging intended to change natural tree species composition to only one or two tree species, such as the predominant Western larch retention in the Tollgate Fuel Reduction Project. (See Image 4, p. 8). This creates an open plantation-like stand, widely spaced for individual tree vigor, not for biodiversity, with only timber industry-preferred tree species—like a tree farm. Such logging removes hiding cover from Lodgepole pine and reduces wildlife habitat diversity represented by Grand fir, potential Engelmann spruce, and other tree species.

Actually, contrary to the claim in the last line of par. 3 on p. 8, we have not seen many examples of successful "reintroduction" (or management) of wild fires on the Umatilla NF except for one wild fire on the Heppner District and possibly one on the North Fork John Day District which may have overlapped with the Malheur NF. Despite the claim that: "It is not the goal of this project to exclude fire" (p. 7, last par.), which usually implies acceptance of the ecological benefits of wild fire, the Pomeroy District of the Umatilla rammed through controversial post-fire logging, which including removal of a lot of green old growth trees just with some fire scorch at the base (often with full green crowns) in the Pomeroy Danger Tree and Salvage sale. This post-fire "salvage" sale is inconsistent with an overwhelming scientific consensus against post-fire logging.

Purpose & Need 2: We are opposed to "area-wide" (landscape scale) logging ("vegetation treatments") between the fuel breaks.

The only stands that could be made more resilient to future disturbances are ones that have already been degraded by logging. Commercial logging creating even-aged single (or few) species stands can dry-out stands and increase wind speeds through the stands, making them less resilient to fire—especially regarding moist mixed conifer.

Range of Variation:

Re: the "Need" discussion on p. 8, the Forest Service cannot legitimately compare the conditions soon after a large wildfire (in Image 5, p.9) with re-growth of forest in less than 85 years later and claim that this shows the effects of wild fire suppression. Notably, the open areas in the two photographs taken in 1935 and 2019 are still following the same pattern in both photos. This may represent typical re-growth since the fire. The higher elevation areas shown likely have a natural fire return interval of about 100-250 years, not necessarily a return interval of less than 85 years. Fire return intervals projected are also ranges, not a fixed year when fires are expected to occur. There was not likely widespread effective fire suppression until the 1950s when World War II heavy machinery started to be used for fire suppression. Thus, these two photos do not really inform "what types of treatments [e.g. logging] should be used." But they do show historic (and current) grass lands and openings largely based on slope aspects and probably also based on soil types and depth of top soils.

How were pre-European contact conditions (around 1840 in this PA text, see p.9 par. 1) determined? There probably weren't forest surveys or aerial photos then, so this determination raises legitimate questions about the process.

This is very biased HRV analysis; you would see more Western larch and Lodgepole pine immediately after a fire, and there would be naturally more Engelmann spruce well after large fires. The Forest Service/timber industry preference is for Western larch and Lodgepole pine. All of this HRV analysis favors logging.

The Pacific Northwest Research Center has refuted the applicability of HRV analysis. Looking back to the past assumed conditions at a static point in time in the context of our rapidly changing climate should not be used as a justification for current logging. To us, this suggests that Grand fir are already experiencing a lot of climate change-related self-thinning mortality in drier forest types. We have observed especially younger Grand fir mortality in more marginal, drier forest sites since the record breaking heat wave in the summer of 2021 while field surveying in Blue Mountains National Forests.

We advocate for the protection of moist mixed conifer from logging removal in higher elevations with more precipitation and longer snow pack retention, where Grand fir and other moist mixed conifer species may be able to persist. All the diversity of tree species and plant diversity need to be protected as habitat for diverse wildlife and essential ecological processes, including water retention. This applies to the IRA and the Municipal Watershed.

How would specific pre-European contact percentages and ranges for structural classes, tree species composition, and tree densities possibly be determined? This is highly suspect.

HRV can also not be determined at the project scale. Multi-strata with large tree structure is not over-represented comparted to the rest of the Forest and the Blue Mountains National Forests in general. This is a case of not seeing the Forest for the trees. Likewise, Engelmann spruce is probably not over-represented, given the high elevation watersheds and the high density of creeks and streams throughout the area. Grand fir is also not likely double the acreage it historically would have occupied in moist high elevation mixed conifer forest that was in the late successional forest stage, as the predominance of different tree species occurs during natural succession. The 1935 photo being used for comparison of historic conditions compared to current conditions is deeply flawed, as the photo represents conditions soon after a major wild fire, when so-called “early seral” species would be more prominent. The existing condition now has not seen a recent wild fire, but this is not necessarily beyond the expected fire return interval for high elevation, moist mixed conifer forest. It is natural for Grand fir to become a late successional dominant species in high elevation, moist mixed conifer forest with long natural intervals between large scale wild fires. Likewise, it is natural for moist mixed conifer forest to be more productive and denser than lower elevation dry forests dominated by Ponderosa pine. To say that the current higher density is over-represented across all “potential vegetation groups” is to ignore natural differences in tree density based on moisture regimes, forest successional stages, and the amount of time since the last large wildfire, which could be between 100 to 250 years for moist mixed conifer at high elevations. Notably these pronouncements have no science citations or detailed analysis supporting these conclusions and they are all biased toward logging multi-strata forest, large trees, Engelmann spruce (which is not a preferred timber industry species) and high density—the usual excuses to log. Yet this is probably the natural condition for a late successional moist mixed conifer forest at high elevation that has never been logged.

Changing this condition by logging just highlights the Forest Service's alignment with the timber industry, and does not represent restoration or any real need to correct significant deviation from a natural condition.

Fire Regimes:

On p. 10, the PA acknowledges that: "In the northern Blue Mountains, fire severity varies with aspect; moderate-severity fires predominantly occur on north-facing slopes (80%-93%) and low-severity fires on south-facing slopes (86%)." This means that is a more natural effect to use prescribed fire on south aspect slopes and lower elevation Ponderosa pine-dominant drier forest historically subject to lower intensity, more frequent fire. This can also be the case for south aspect slopes even at higher elevations. The higher elevation moist mixed conifer and north slope habitat retains more moisture and is naturally more productive and denser—especially when on ash soil inclusions. These more productive moist forests should not be logged or prescribed burned to reduce future fire intensity or prevent water stress-based competition between trees. It should be remembered that there is significant self-thinning of moister mixed conifer forests as well as in drier forests, creating needed snags and logs for wildlife habitat. Logging, on the other hand, reduces mature and large tree structure, overall forest cover, future snags and logs, and carbon sequestration and storage—caused by unnatural removal of tree structure from the ecosystem.

Regarding the "Fire Regimes" discussion in Table 2, the PA fails to disclose scientific controversy over the use of Fire Regimes and Condition Classes, as well as scientific controversy over the use of HRV to rationalize logging and tree species conversion.

The assumed fire regimes are highly questionable, as it's very unclear how the acreage of historic fires was determined, why Regime 2 would burn in the spring, and especially how such specific "missed fire return intervals" were determined, given that such fire return intervals would naturally be quite variable, depending on factors such as ignition frequency and locations, moister periods, heat waves, droughts, wind speeds, etc.—notably not generally based on biomass "fuel loading." The exact numbers of "missed fire return intervals" seems very subjective, given all the variables at play and greatly varied past histories of fire return and fire sizes.

However, assuming that Table 2 could be at least somewhat accurate for coarser scale generalizations, notably the infrequent, higher severity fire regimes (such as moist mixed conifer and cold Lodgepole pine forest) have not missed fire return intervals or have very few missed fire return intervals based on Table 2. Based on Table 2, planned logging of fire regime 3 to 5 areas should be dropped since they may not have had missed fire return intervals and are on a natural trajectory.

Re: p. 11: We were strongly opposed to the Cobbler sale, but the Forest Service kept withdrawing the decision upon appeal, and then kept reinstating the sale plan, greatly complicating the public involvement process. Such experiences typify the Forest Service being entrenched in their opposition to ecological protection (or any other ideas but their own) that are opposed to logging. Actually, the original stands prior to logging had more Engelmann spruce

and Grand fir than Ponderosa pine, Douglas fir, and Western larch, based on our field surveying of the sale units. This was high elevation for being further north near La Grande, with very moist mixed conifer at the top of the plateau, not mostly dry forest as implied.

Re: p. 12: Why is the Grizzly Complex Fire considered an uncharacteristic disturbance event? There have been many very large scale stand replacement fires historically. It's very hard to see much difference between the three small scale aerial photos. It's hard to see the logging effects and the fire effects. If this area didn't burn severely, it's likely due to a very high water table with lots of moist and wet meadow fuel breaks and very moist forest with standing water at the top of the plateau. The highest number of old growth trees in the old growth count for at least one sale unit was Engelmann spruce, not Ponderosa pine, Douglas fir, or Western larch. Notably, the area's forest may also have resisted the fire well because large trees ≥21" dbh were retained. The retention of large trees means that the most fire resistant size class of trees was retained. Large trees would preserve water retention through shading and a wet to moist mixed conifer forest type.

Having field surveyed the Cobbler sale thoroughly prior to logging, it is not at all clear to us that the logging was effective at reducing the fire intensity as claimed, although non-commercial thinning and prescribed burning may have helped. Nor is it clear that logged stands acted as a buffer to adjacent to unlogged stands from the fire, as the stands were mostly adjacent to wet meadows and were very moist to wet stands on the top of the plateau. The photos really don't demonstrate anything with regard to the cause of the greater resilience to fire. However, we're glad it is still relatively intact green forest. Wildlife there included wolves, Black bears, moose, likely lynx, Columbia White-tailed deer, and Columbia ground squirrel.

Purpose 3:

Commercial logging on steep slopes with ash soils over creeks and tributary streams is almost certain to degrade the municipal water supply, as well as degrade wildlife habitat, listed and Management Indicator fish species habitat, recreational values, and carbon sequestration and storage. Wild fire degradation to the water supply is only speculative. Wild fire is a natural disturbance that is inevitable and creates habitat niches for fire-adapted species, as opposed to the unnatural and destructive effects of logging.

Commercial logging is inconsistent with the need to protect water quality—especially given the majority of the sale units being on very steep slopes over down slope creeks or tributary streams. The ash top soil typical for moist mixed conifer, which is the most abundant forest type, is easily displaced and can introduce excess fine sediment into the streams and creeks to the detriment of water quality and fish species.

"Municipal watersheds are managed to provide a sustainable supply of high quality safe drinking water at minimum of environmental and economic costs." (PA p. 12, 2d par. After "Need"). The proposed action is unlikely to provide a sustainable supply of high-quality safe drinking water, nor is it based on minimal environmental and economic costs. The proposed action would cost far more economically and with much greater environmental impact costs than leaving the Municipal Watersheds alone by <u>not</u> logging them or building more "temporary" roads

and reconstructing closed roads. So far, leaving the Municipal Watersheds/IRAs unlogged has preserved a sustainable supply of high-quality safe drinking water while also maintaining the integrity of forest cover, old growth forest habitat, large tree structure, prime wildlife habitat, soil integrity and productivity, high quality fish habitat, and recreational values, including high integrity scenic views. Why change course? Logging and prescribed burning could increase the risk of severe fire in a naturally moist forest type. Logging and roading are likely to impair both water quality and fish habitat. Loss of forest cover from logging could reduce water retention. The timber sale, as proposed, would have astronomical costs with helicopter logging and cable yarding, which would exact a toll on the forest's integrity, and on retention of large tree structure and old growth habitat for wildlife and carbon storage if the Forest Service persists in planning helicopter logging and cable yarding on steep slopes.

Much that is being blamed on unidentified "Disturbances" regarding negative impacts are also foreseeable negative consequences of the planned logging and roading. For example: "Disturbances that alter physical and biological components of a landscape can change the hydrologic response of a watershed by altering how precipitation is captured, stored, and released….[L]and use change…can reduce or eliminate vegetative cover (i.e. trees and shrubs) and ground cover….[C]hanges in vegetative structure can reduce rainfall interception, water infiltration, and evapotranspiration, which can increase the amount of surface runoff and streamflow, respectively, and can also alter the timing of that flow. Increases in runoff and streamflow can lead to a decrease in water quality from non-point source pollutants through increased nutrient and sediment loads because [of] hillslope erosion transported into streams, as well as increased streambank and streambed scour. Suspended sediment is the major nonpoint source of pollution in forests." All of these degraded conditions are more definite risks from steep slope logging over creeks and streams and road construction and road reconstruction than from more speculative effects from unknown wild fire incidence, severity, extent, and location. When a wild fire would take place and whether any "fuel" reduction done would still have any effect on the fire is also very speculative.

Re: Image 9 on p. 12: Sediment flows tend to be much heavier when the wild fire-affected forest has been logged. This is not disclosed in the Proposed Action document. The Summit Fire on the Malheur NF is a good example of very heavy overland sediment flows after post fire logging. Roads were hydrologically connected to streams, so there were heavy sediment flows into the stream system where roads crossed the streams and on downhill curves that funneled sediment into streams.

Wildfire Risk:

Scientists invited to a Region 6 meeting in Baker City years ago were clear in relaying that high elevation moist mixed conifer forest is not a high priority for fire hazard reduction, as it is inherently moister forest with infrequent natural mixed to high severity wild fire. Many wildlife species and plants are adapted to high severity stand replacement fire that need this fire intensity to create habitat niches with which they evolved.

Tree thinning:

If there is no non-commercial thinning planned for the 9,343 acres where only "merchantable-sized material would be cut and removed", these stands are not likely to be unnaturally dense. Conifer "encroachment" would consist of small trees, usually only up to about 9-10" dbh, not 15" dbh or greater. What is the minimum commercial logging size in dbh?

It sounds like a lot of the forest planned for logging has never been logged before—especially in the IRAs and Municipal Watersheds, but also in other areas with no road access, such as Big Game Winter Range, and other areas planned for logging, such as the Research Natural Area, which should be left alone. We are strongly opposed to the logging of never-logged forest or only lightly logged forest or forest that has recovered well from past logging long ago.

The largest and healthiest trees should always be retained, not just "generally." So-called "stocking ranges" are arbitrary silviculture methods to increase individual tree vigor, as in tree farms, which is not appropriate for wild forests on National Forests.

Drop all proposed clearcutting ("Seed Tree Cuts")—all 379 acres of these. Clearcuts and virtual clearcuts are very destructive to soils, wildlife, plant biodiversity, recreational values, and carbon sequestration and storage to reduce extreme climate change effects.

Drop all commercial thinning in never-logged forest and drop all logging of overstory trees and co-dominant tree species. We are strongly opposed to all logging of large trees ≥21" dbh, regardless of tree species. Large tree structure is critical for wildlife habitat, riparian processes, recreational values, clean water, and carbon sequestration and storage. Consider doing only non-commercial thinning in already logged stands and using prescribed burning instead of logging in dry forest types. Greatly reduce or eliminate the 6,554 acres of planned commercial thinning. Drop all logging in all sale units in the Inventoried Roadless Areas, the Municipal Watersheds, the Natural Research Area, RHCAs, old growth habitat, Big Game Winter Range, the Wildlife Habitat Management Area, and other Management Areas listed earlier in these comments where we recommended that all commercial logging be dropped.

Drop "Improvement Cutting", which is a euphemism for heavier logging, over the entire 2,410 acres.

Dropping the heavier logging planned would allow for natural re-seeding of trees, which is preferable to artificial planting. Natural regeneration doesn't artificially manipulate tree species composition and has a greater chance of success than artificial planting. Artificial planting may end up with excessive density due to outdated "stocking" guidelines that encourage over-planting, and would use cloned seedlings often from different areas that are not adapted to conditions of the planting location. The Umatilla NF has a long history of planting Ponderosa pine in clearcuts in the middle of moist mixed conifer forest, with the pines not doing well and becoming stressed and sickly. Planting seedlings after heavy logging such as clearcuts and so-called "improvement cuts" is a step toward establishing even-age, single or few tree species plantations that are homogenous and vulnerable to insect epidemics, diseases, and wild fire.

It seems that "less desirable trees" is code for tree species not preferred by the timber industry, not undesirable to the public or wildlife.

The Forest Service must be relying on a lot of large (and old) tree logging to make it economical to do helicopter logging. This is a clear timber grab that really has nothing to do with fire hazard reduction when so many mature and large trees would be logged to make sky line and helicopter logging feasible. Mature and large trees are not significant to fire risk as they are more resistant to fire.

We are opposed to all steep slope logging due to loss of more remote wildlife refugia habitat, displacement of ash top soil, sedimentation of streams, and impacts to many wildlife species, including Bull trout, Redband trout, and Columbia Spotted frog.

Tethered cable logging should be dropped from the proposed action, as it is very hazardous to the loggers and would cause long-term soil impacts. Tethered cable logging has just been devised to able to log more steep slopes economically, yet there are many good reasons not to log steep slopes, including displacement of irreplaceable productive top soil, sedimentation of streams and fish habitat down slopes, and loss of isolated wildlife refugia for many species, including elk and rare predators.

Don't use grapple piling, as this tends to burn down to mineral soils from the fire intensity.

The Forest Service needs to perpetuate the integrity of the Municipal Watersheds and the IRAs by not logging these specially reserved areas for protecting drinking water sources and for the IRA characteristics of water retention, water quality, wildlife refugia, intact natural ecological processes, solitude, remoteness, and semi-primitive recreation. Not logging and roading the IRAs and Municipal Watersheds would preserve the integrity of headwaters for declining fish species like Bull trout, and assist in the restoration of historic fish species such as Steelhead trout and Chinook salmon. It would also assist in the preservation of cold water habitat for Sensitive mussel species and riparian habitat for Columbia Spotted frog and salamander species. Not logging and roading would also preserve plant diversity, water quality, and the viability of rare and far-ranging predators, such as recovering Endangered Gray wolf, Threatened Canada lynx, Candidate for up-listing Wolverine, Sensitive Pacific fisher, and vulnerable-ranked and Management Indicator species American marten, as well as other far-ranging wildlife, including moose, Bighorn sheep, and Neotropical migratory songbirds.

Based on the standard old school logging methods planned and the emphasis on heavy logging, logging large trees, and exploiting areas that have never been logged before since they were off limits to logging, this is obviously just a business-as-usual timber sale that is not really geared toward fire hazard reduction. When over 60% of the forest is moist mixed conifer that is naturally more productive and denser, and subject to infrequent stand replacement fire, commercial logging would dry out these moist stands by reducing shading, removing or eliminating future large water-retaining logs, and exposing disturbed ground openings to drier micro-climate conditions, as well as removing mature and large trees more likely to survive fire, while stimulating in-growth of more flammable small trees.

Non-commercial thinning:

The most effective way to reduce fire hazard is to just use non-commercial thinning, with prescribed fire only in dry forest types, not commercial logging. If the Forest Service is serious about protecting water quality while removing some of the most flammable small trees along access road control lines, they should focus on non-commercial small tree thinning and selective use of prescribed fire outside of the Municipal Watersheds and the Inventoried Roadless Areas. Most fire risk reduction should be done immediately around homes and communities, not in the high elevation back country.

Surface Fuel Reduction:

Don't remove or reduce existing down wood—especially large down wood. Lop and scatter slash as much as possible rather than pile burning. Slash piles form flammable tinder for wild fires.

Prescribed Fire:

Don't ignite prescribed burns within the IRAs/Municipal Watersheds. We are concerned that prescribed burning, which is really intended to mimic low intensity frequent fire, is unnatural for high elevation moist mixed conifer forest and could degrade associated wildlife habitat (e.g. soft snags and logs for Pileated woodpecker and Black bear foraging and abundant down and elevated logs for marten subnivean winter foraging.) Prescribed fires ignited in high elevation, denser forest could also accidentally start a stand replacement fire, thus defeating the purpose and need for the project.

We support managing, rather than suppressing wild fires in the back country when feasible.

Not doing prescribed burning in the IRA and the Municipal Watershed would eliminate the need for all or most of the planned "control line" (fuel break) construction.

Prohibit prescribed burning during the spring reproductive season to avoid negative impacts to fledgling birds, young mammals in burrows, Sensitive plant reproduction, and loss of soil water retention just before the dry season. The Heppner District of the Umatilla has successfully implemented controlled prescribed burns during patchy spring snow melt before the spring reproductive season and spring rains, avoiding these negative effects.

Don't commercially log intensively enough to require planting. Drop planned Seed Tree clearcuts, heavy logging like "Improvement" cuts, and drop all large tree logging and logging in RHCAs. Natural regeneration is far superior to planting, which is usually geared toward converting tree species composition to timber industry-preferred tree species, losing tree species and biodiversity in the process.

Reduce under-burning and drop landscape scale burning by only doing prescribed burning in dry forest types at lower elevation, not within the IRA or the Municipal Watersheds. Dry forest types should be defined by Ponderosa pine dominance, south slope aspects, dry Plant Association Groups, and lower elevations. The PA admits regarding landscape burning that: "This method would be used to favor early seral, fire resistant species", which is more appropriate for dry forest types, not moist mixed conifer or cold Lodgepole pine forest. Don't use prescribed fire in

the Mill Creek Watershed and the overlapping Mill Creek IRA. Instead use prescribed burning and non-commercial thinning next to major roads outside the Municipal Watersheds and IRAs for fuel breaks in already logged areas. Commercial logging tends to leave dense, spindly thickets of small young trees, while never-logged forest is more variable.

See our earlier listing of Management Areas that should not be commercially logged regarding Table 3 on p. 17. The only Management Areas we identify as not having management guidance that indicates more protection from logging are (possibly) A4 Viewshed 2 and E2 Timber and Big Game.

Mechanical Treatments and Prescribed Fire:

We are opposed to follow-up maintenance mechanical (logging?) and prescribed fire management that perpetuates an unnatural state of the forest. We agree that "[t]he use of wildland fire is the most cost effective and ecologically beneficial way to sustain the landscape." (PA p. 17)

Riparian Habitat Conservation Area Treatments:

We support there being no mechanical management (e.g. commercial logging and heavy equipment use) in RHCA categories 1 and 2 and only limited non-commercial hand thinning of trees less than 9" dbh in Category 4 RHCAs. However, we question whether much non-commercial thinning is really needed in RHCAs, as dense areas appearing in LIDAR or aerial photos could be riparian hardwoods. We support there being no fire ignition in RHCAs, but fire being allowed to back into RHCAs.

Roads Management:

Drop all reconstruction of closed roads and construction of "temporary" roads. This would reduce cost, fragmentation of wildlife core habitat blocks, excess sedimentation of streams, invasive plant introduction and dispersal, illegal firewood cutting, and ATV access that increases wildlife disturbance. Drop all 12.95 miles of "temporary" road building. So-called "temporary" roads are seldom fully decommissioned and are often re-used, becoming de facto system roads. We support decommissioning of roads.

Public Involvement:

We haven't heard of this proposed timber sale until now. We did not receive a mailing of this Proposed Action document until we requested it, even though we have been on Umatilla NF mailing lists since 1991. We weren't invited to the field trip or the virtual engagement session. We were also not notified of the online story map. We have been commenting on, field surveying, and otherwise addressing proposed timber sale "projects" on the Umatilla, including the Walla Walla Ranger District, for many years—decades in fact. To not include BMBP in these early processes is biased and is indicative of incomplete public outreach for the Tiger-Mill timber sale. We field surveyed the Tiger-Webb proposed timber sale in part of the same area as this sale. Unfortunately, I won't be able to come to the Open House on February 15th as I will be out of the country on a long planned vacation.

Until mid-April, please send all documents regarding this sale to me at my Portland address: 5323 NE 28th Ave., Portland, OR 97211. After mid-April, please send any related documents to my Fossil address, which is my permanent address: 27803 Williams Lane, Fossil, OR 97830. Please be aware that I do not have any regular internet access for 7 months of the year, so I request mailing of hard copies of NEPA project documents. My voicemail number is (541) 385-9167.

EA/FONSI/DDN Review:

NEPA requires a 30-day comment period for an EA with a later Draft Decision Notice and a 45-day objection period after the 30-day comment period for the EA. What is the point of preparing an EA disclosing more site-specific information and analysis not disclosed in the scoping letter or this "Proposed Action" document, if the public is not allowed to comment on all that new information? The EA comments are intended under NEPA to provide guidance to the agency for decision-making regarding adoption of potential action alternatives or the No Action alternative. Not being allowed to comment on alternatives and effects analysis for the timber sale "project" is illegal under NEPA.

Comments on Appendix A – Maps and the maps included in the "NOPA Maps" folder found at https://www.fs.usda.gov/project/?project=62658.

Please send us a larger-scale copies of all maps found in Appendix A on pages 23, 26, 27. BMBP plans to field survey the proposed commercial logging sale units that the public has access to prior to implementation. It is also concerning that there is proposed commercial and non-commercial logging planned for in the Municipal Watersheds that the public supposedly does not have access to. See PA. p. 2 ("Entry to the watershed is limited to permit holders to conduct management activities that benefit the watershed, including a special elk hunt."). This restriction of access greatly reduces the public accountability and transparency of the planned logging in these important watersheds. We request more information specifically about access to the watershed, including who currently holds permits to access the area and the availability of these permits to potentially conduct non-destructive field surveying of the area. BMBP believes this field surveying would only "benefit the watershed."

And, although not included in the Notice of Proposed Action, BMBP also requests a large-scale copy of the "Project Area" Map ("Map02_Project Area_8x11.pdf") included in the "NOPA Maps" folder at https://www.fs.usda.gov/project/?project=62658. We also request more detail be provided, including road systems, road numbers, check names, section lines, section numbers, landmark names, Tiger-Mill project boundaries, municipal watershed boundaries, and private property boundaries overlayed on this map.

Page 22 "Land Management Areas"– There should be absolutely no commercial logging in the Research Natural Area. This would change its natural condition that should be preserved for scientific study, wildlife and plant biodiversity, and as a basis for comparison of management elsewhere for adaptive management. Logging a RNA would be a violation of the Forest Plan.

After decades of over-logging, now being done on a landscape scale, the Forest Service should not be logging any of the last "undeveloped" never-logged areas—including all IRAs, RNAs, and municipal watersheds. Never-logged areas are vitally needed for wildlife and aquatic species refugia, semi-primitive recreation, solitude, preservation of water quality, plant biodiversity, and natural unaltered ecosystems processes. Never-logged areas are especially important carbon sinks necessary to reduce the effects of climate change.

Big Game Winter Range, especially where it has never been logged before, should not be logged. Elk and deer need thermal cover to protect them from severe winter storms.

Page 24 "Preliminary Proposed Action Potential Vegetation Groups" – The vast majority of the Tiger-Mill are forest is moist forest, with a considerable amount of cold forest. Both of these forest types should not be prioritized for fire risk reduction logging based on the consensus of many scientists. There is nothing unusual or out of balance about this mosaic pattern of forest types and the predominance of denser moist and cold forest types in never-logged high elevation forest. The naturally higher productivity of moist and cold mixed conifer forest is derived from higher levels of precipitation, longer snow retention, more ashy soils, and naturally less frequent fire. These natural conditions are a blessing for retaining moisture in a municipal watershed, not a "risk" that should be corrected by creating more open, dry forests with species composition changes, as proposed with this project.

Page 25 "Preliminary Proposed Action Fire Regime" – With a complete lack of detailed, in-depth effects analysis, the NOPA fails to disclose the scientific controversy surrounding the use of fire regimes and condition class being used to justify timber sales. Forests naturally go through natural succession with varied density that does not always closely correlate with fire "risk." Moist mixed conifer forests that have contiguous denser canopies retain more moisture, with fires often dropping down and just causing patchy spot fires, which create natural openings for habitat diversity. I've seen clearcut and widely spaced Ponderosa pines created by fire risk reduction logging burn up completely while the fire stops and slows as it enters the transition to moist mixed conifer forest, as was the case with the McCache Fire on the Deschutes National Forest. Yet none of this is acknowledged. Fire "risk" reduction is still being used to rationalize huge timber sales and logging in areas formerly protected from logging for good reasons and with strong public support, such as IRAs and municipal watersheds.

Page 26 "Preliminary Proposed Action" – The map on page 26 shows proposed non-commercial thinning along the ridgelines. BMBP would like to see this non-commercial thinning along the ridgelines dropped from the proposed action.

Page 27 "Preliminary Proposed Action" - The Forest Service should drop all proposed "temporary roads" from the proposed action. These roads would fragment otherwise undisturbed wildlife habitat, contribute to sedimentation of streams into the future, introduce invasive plants and allow them to spread, and create access for ATVs and illegal firewood cutting. The Forest Service should also confine "potential control lines" to major existing roads with no commercial logging incursions into the IRA and the municipal watershed. This seems like a standard destructive timber sale and a foot in the door to set a precedent for logging IRAs and municipal

watersheds. This is unacceptable. The planned "temporary" roads would cause fragmentation and management destruction with long-term access effects, as many temporary roads are never decommissioned and are often re-used by the Forest Service and the public.

NOPA Maps folder "Map01_Vicinity_8x11.pdf" – This area has a high concentration of creeks and tributary systems in the municipal watershed and IRA. These areas, and the creeks and tributaries within them, should be fully protected from management impacts such as logging, temporary roads, and prescribed burning in remote high elevation moist mixed conifer forest and precious wildlife and Threatened aquatic species refugia. Please let us know what publicly accessible routes provide the easiest access to the sale areas accessible by the public.

NOPA Maps folder "Map07_PPALRx_8x11.pdf" – According to this proposed action, prescribed fire would be used across most of the watershed and IRA with the potentially disastrous results of starting a stand-replacement fire. The inappropriate use of prescribed fire—which was designed for dry forest types to mimic low intensity, frequent fires, but is planned for use over most of the moist mixed conifer forest that covers 60% of the project area—would alter the natural disturbance effects and habitat structure needed by moist mixed conifer associated species. This would occur by reducing abundant logs for marten foraging, soft snags for Lewis' woodpeckers, soft grand fir snags and logs for pileated woodpecker and black bear foraging, multiple canopy layers Neotropical migratory song birds, thermal and hiding cover for elk and deer, and existing snags and log structure along creeks for fish and other aquatic species.

Comments on Appendix B - Project Design Criteria:

FR-2 is in direct contradiction to another Project Design Criterion that claims adherence to use of full PACFISH/INFISH RHCA "no logging" buffers, as these buffers are less in width than those required by Forest Plan PACFISH/INFISH buffers. Full PACFISH/INFISH RHCA buffers should be used. See the contradictory PDC WO-1 "Water Resource" on p. 32 that promises to use full RHCA buffers. FR-2 should be changed to be consistent with PDC WO-1.

Re: Soil Resource PDC SR-1: As steep slope logging is recognized to "always be in the high and very high erosion hazard class", all steep slope logging should be dropped, especially since steep slopes are usually over creeks and streams and pose a sedimentation hazard to the water supply and fish species if logged.

Re: SR-4: Strictly prohibit driving, skidding, and landing use on shallow soils without exceptions.

Re: SR-6: Use only non-commercial thinning by hand, not with ground machinery.

Re: SR-8: Drop all "temporary" roads.

Re: SR-11: Don't log on any slopes exceeding 35%.

Re: SR-12: Drop all the listed sale units with unstable slopes from heavy machinery use, including logging: Thinning sale units 001, 020, 285, 300, 338, 346, 353, 359, 362, 421, 463, 469, 497, 498, 500, 502, and prescribed fire units Rx 01 and Rx 45.

Re: WO-6: All wet areas should have to be avoided with haul routes and ground-based machinery, including streams, springs, seeps, and wetlands.

Re: WO-7: Drop all "temporary" roads—note the concern of potential hydrological connection of roads to streams.

Re: WO-11: Don't reconstruct roads or build "temporary" roads that cross draws or channels.

Re: WO-12: Don't allow any crossing of ephemeral draws.

Re: WR-1: We support wildlife corridors retaining greater than 60% canopy closure and scattered understory patches. However, we are opposed to commercial logging in wildlife connectivity corridors, which are now more important than ever for successful migrations and dispersal of wildlife species under extreme climate change, when wildlife may need to move north and to higher elevations to have suitable cool, moist habitat. Drop the commercial logging in the listed sale units for wildlife corridors: all or part of sale units 35, 36, 37, 41, 118, 130, 131, 260, 274, 285, 288, 362, 415, 424, 427, 436, 441, and 468.

Re: WR-3: These buffers should be at least 50' for rock outcrops and caves and at least 100 feet for seeps, springs, and fens ("bogs") based on PACFISH/INFISH RHCA buffers.

Re: WR-4 and WR-5: We support retention of all snags.

Re: WR-6: Leave all existing large down wood.

We support WR-8 and WR-9 for protection of Northern goshawks and TESC species.

*Please send us large scale copies (big enough to read road numbers, clearly see topographic lines, etc.) of the following maps: Those included with the Proposed Action: the maps called Preliminary Proposed Action—Ownership and Proposed Treatment, Preliminary Proposed Treatment—Ownership and Logging System, Land Management Areas, Potential Vegetation Groups, Project Area, and Inventoried Roadless and Wilderness Boundaries. We intend to field survey proposed commercial logging sale units the public has access to and want to make sure we are in the right location for the sale unit. The maps also help us prioritize where to field survey. Please send hard copies of these large scale maps to me at my winter address if you are sending them before mid-April: 5323 NE 28th Ave., Portland, OR 97211.

Aquatics Comments

Blue Mountains Biodiversity Project is extremely concerned about the logging on steep slopes above creeks being proposed as part of the Tiger-Mill sale. Many of these creeks support Bull trout and other aquatic species that are dependent on cold, clean water. Steep slope logging, particularly on sensitive or thin soils, all too often result in negative impacts to soils, detrimental soil conditions, erosion, landslides and slumps, and excess fine sediment delivery into streams. In addition, Road-related activities in the Tiger Mill sale, including road construction and repair, are

also likely to exacerbate and amplify these issues, and cause delivery of excess fine sediment into streams. Please see additional discussion below for more detail and citations. We're very concerned about damage to soils, erosion, and fine sediment delivery into streams.

Most of the planned logging in the Tiger-Mill project appears to be on steep slopes, with the majority of sale units prosed as helicopter, skyline, or tethered-assist. How much of the logging planned for steep slopes will be virtual clearcuts ("seed tree with reserves") or contain very heavy thinning with large openings and low basal areas? It's not clear from the scoping notice what canopy densities or basal areas will be left after likely heavy logging. "Regeneration harvest" seems to be classified as a subcategory of thinning in the FS's proposed action description. We also note that "thinning" on National Forests in the region can and does include heavy logging that is at odds with how the FS generally promotes "thinning" to the public. Please see the photos below of recent logging in 2021 and 2022 on National Forest lands in the Blue Mountains considered to be "thinning" by the Forest Service. The units below show "Stand Improvement Thinning" sale units within the Camp Lick sale on the Malheur National Forest. There is a clear discrepancy between what is being sold to the public as "thinning" and what is actually happening on the ground.

Logging, particularly heavy logging, on steep slopes above creeks is likely to create erosion, generate excess fine sediments that reach creeks, and negatively impact streamflows, watershed hydrology, water quality, and aquatic species.

The photo below is the Forest Service's example of "Free Selection" thinning, which the agency provided in their environmental analysis for the Big Mosquito sale:

Figure 15. Photos illustrating potential post-treatment stand conditions for the Free Selection prescription in mixed conifer stands in the Big Mosquito project planning area

Here is a real-life example of "Free Selection" thinning, which BMBP found in the Big Mosquito timber sale– much different than the Forest Service's depiction:

Additionally, logging on thin soils, on ash soils, and in rain-on-snow zones greatly increases the risk of soil damage, erosion, and excess fine sediments in streams. These areas may be at risk of soil damage, compaction, and displacement, should this proposal be implemented. For example, in another sale on the Umatilla NF, the Upper Touchet sale, the FEA notes on pg. 47 that the

"[e]ffects of ashy soil displacement and compaction by ground-based and cable activities on soil productivity is immediate and will persist on the landscape for up to 20 years or more (Giest, 1989)" (USFS 2020). The Upper Touchet FEA also states: *"Ashy soils have low bearing strength and are susceptible to increased soil displacement and compaction by logging activities. When non-mixed ashy soils are disturbed, erosion is greater due to fine particle size and lack of cohesiveness between ash particles."*

What percent of the soils in the project area are ash soils, or other sensitive soil types that may be particularly at risk of disturbance from logging and roading? Where are these ashy and sensitive soils located? On steep slopes? Logging on steep slopes, as well as in the Municipal Watershed and the IRA and Natural Research Areas should be dropped.

Road-related activities such as road construction are documented to cause large amounts of excess fine sediments, which can then be delivered into streams. Particularly if roads are hydrologically connected to streams, excess fine sediments generated by road-related activities are likely to be delivered into streams and have detrimental impacts on water quality, stream structure, and aquatic organisms. Roads and the road-related activities associated with timber sales can negatively impacts on watershed hydrology, peak and base flows, excess fine sediments, and stream temperature. Negative impacts to groundwater and water storage on the landscape are also concerns. (Please see below for additional detail and citations)

"Temporary" roads are not temporary. Negative impacts such as soil compaction, erosion, and fine sediment generation and delivery into streams can persist for decades, even when roads are closed or decommissioned. In addition, "temporary" roads are frequently not decommissioned as planned once sale implementation is completed. All too often, funding for road decommissioning is not secured, despite FS assumptions in NEPA analyses that roads will be decommissioned upon sale completion and therefore have no or minimal impact. In addition, in timber sale after timber sale, the FS repeatedly rebuilds roads on existing "road prisms" and so supposedly add only minimal disturbance on the landscape. Yet, these same road prisms do not show up on existing road maps or in road density calculations. Somehow, these road prisms are both widespread on the landscape and enough of an existing disturbance that reconstructing the road is a relatively minor impact according to the FS—yet at the same time the FS claims, in sale after sale, that any "temporary" roads they create basically cease to exist or have any detrimental soil condition or effects after sale implementation.

Building 12.95 miles of "temporary" roads in addition to extensive road reopening is unacceptable, particularly in an area so important for drinking water, Bull trout and other imperiled aquatic species, and wildlife. Road densities bordering the IRAs and Wilderness areas are already high. Building and reconstructing more roads in this area will only fragment and degrade wildlife, water quality, and fish habitat. Further, building and rebuilding roads will further increase human access in the area, including potential access into IRAs and Wilderness Areas and/or their perimeters—

this will increase edge effects and fragmentation; chances for fire ignitions; poaching; conflict with wildlife; and activities such as dispersed camping and driving adjacent to streams, potentially negatively impacting water quality. Also, the "temporary" roads built on private land that, as stated in the FS's proposed action notice, will not be decommissioned after project completion, are glaringly *not* temporary. This project will increase road density and road-related negative impacts to water quality and fish in a sensitive area where the FS should instead be prioritizing water quality and Bull trout habitat.

Where in the Tiger Mill sale are "temporary" roads and road construction proposed? Will they interact with stream channels or include stream crossings? Will they be hydrologically connected? Is the funding for their decommissioning already secured?

Excess fine sediments generated by road-related erosion or logging-related soil compaction may be carried farther across the landscape because of decreases in water infiltration or runoff rates over damaged soils, which in turn can cause an increase in the distance of overland flow transporting the sediments. Thus, the sediments generated by management activity may be more likely to reach streams (Croke & Hairsine 2006; Wemple et al. 2001). In addition, improper road drainage can cause gullies, landslides, and other erosional features, which in turn lead to sediment generation, increased runoff, and more direct and rapid transport of runoff and sediment to streams (Reid et al. 2010). Furthermore, the distance of travel required for sediments to enter streams may be shortened by the artificial extension of stream networks by roads and culverts (Wemple et al. 1996). Increases in the efficiency of delivery of water and sediment to streams due to road networks and changes to soil infiltration and groundwater inputs can affect the timing, magnitude, duration, and frequency of sediment inputs." Roads increase peak flows by intercepting surface and subsurface flow, and diverting it into culverts and ditches that drain into streams (Wemple et al. 1996). Instream sediment dynamics such as timing and placement of fine sediment deposition, embeddedness, and scour are affected by stream power and flow regimes (Moore & Wondzell 2005; Wood & Armitage 1997; Wondzell et al. 2005).

Logging, especially logging of large trees (such as those >20" dbh), will increase surface runoff and overland flow, which delivers warmer water (and excess sediments) into streams quickly and can affect peak flows and increase stream temperatures. In addition, increased surface runoff and faster delivery of water into streams also means that less water becomes groundwater. This decreases groundwater storage, groundwater flows, and hyporheic flows (Coutant 1999; Croke & Hairsine 2006; Jones & Grant 2006). Logging, including upland logging, can cause decreases in summer baseflows in the long-term. Decreased canopy cover due to logging can cause more snow to accumulate in these more open areas, which alters the timing and magnitude of runoff from snow melt. This can also cause changes to peak flows (Harr & Coffin 1992). Should this proposal to increase logging of large trees be implemented, it would create more open canopies across the landscape, which will then increase solar radiation inputs in watersheds, and as a result may increase the amount of early snow melt. This, in turn, may further alter peak flows and groundwater recharge and the hyporheic cold water delivery downstream, including to perennial streams

(Caissie 2006). Logging alters microclimates, creating hotter, drier, and windier conditions that stretch beyond forests directly affected and into adjacent forests, sometimes for distances of hundreds of feet. Such microclimate edge effects could extend into the entirety of riparian buffers, especially in smaller headwater streams (Chen et al. 1995; Brosofske et al. 1997; Chen et al. 1992).

Logging in uplands as well as riparian areas can affect fine sediments and temperature as well as peak and base flows, nutrient cycling, and composition of biota. For example, some studies have found selective logging (thinning) may be associated with increases of instream fine sediments (Kreutzweiser et al. 2005, Miserendino and Masi 2010), changes in macroinvertebrate community structure or metrics (Flaspohler et al. 2002, Kreutzweiser et al. 2005), alterations in nutrient cycling and leaf litter decomposition rates (Lecerf and Richardson 2010), and increases in stream temperatures (Guenther et al. 2012). Guenther et al. (2012) found increases in stream temperature in relation to selective logging. The Guenther study found increases in bed temperatures and in stream daily maximum temperatures in relation to 50% removal of basal area in both upland and riparian areas. Increases in daily maximum temperatures varied within the harvest area from 1.6 to 3 degrees Celsius. Pollock et al. 2009 found that stream temperature was more closely associated with degree of logging within catchments than with streamside vegetation (Pollock et al. 2012). Flaspohler et al. (2002) noted that changes to biota associated with selective logging were found decades after logging.

High stream temperatures are already a limiting factor for fish in many streams and rivers on federal public lands in the Blue Mountains, and are the most common water quality impairment on National Forests. At-risk fish are already struggling due to high stream temperatures and increased fine sediments in many areas. Stream temperature increases, especially in areas that are already in violation of state and Forest Plan stream temperature standards, are especially dangerous to Sensitive fish and aquatic species. Even if temperature increases aren't detected at larger watershed scales, localized increases at the subwatershed or reach scale can be very important for already Threatened fish stocks—especially if the problem is repeated in multiple stream reaches across the landscape.

Headwater streams and non-fish bearing streams are particularly at risk and need more, not less, protection. In order to protect downstream fish bearing reaches, headwater streams need at least as much protection as larger downstream reaches (Rhodes et al. 1994; Erman et al. 1996; Espinosa et al. 1997). Negative impacts to upstream reaches, such as higher temperatures, increased sediment loading, down-cutting, and altered hydrographs also negatively affect downstream reaches.

We're very concerned about the effects from logging on water quality, stream habitats, and watershed hydrology. In particular, we're very concerned about these likely negative effects as a result of the combination of proposed activities including: logging on steep slopes above creeks, many of which support Bull trout and other imperiled aquatic species; thinning within RHCAs; logging in sensitive and ecologically important areas; heavy logging including "regeneration harvest" (virtual clearcuts); widespread burning including in RHCAs; cable/cable assist logging; and road building and re-building and other road-related activities.

Even when limited to thinning of smaller diameter trees, logging with RHCAs may compromise the ability of the riparian buffer to protect streams or ameliorate the negative impacts from upland logging, including increased stream temperatures and the delivery of sediment and nutrients into waterways. Small streams are particularly vulnerable to temperature, even with limited selective logging.

There is evidence to suggest that wider buffer widths may be necessary to protect stream temperatures, particularly in intermittent and headwater streams, and particularly when logging within 100' of streams. Parameters that influence stream temperatures include, stream shade, overland flow, groundwater and hyporheic flows, and groundwater storage. Alteration of these parameters can increase stream temperatures, especially in small streams. Logging alters these parameters, and degrades the ability of these parameters to support cold water, and is likely to increase stream temperatures. (Caissie 2006; Davies & Nelson 1994; DeWalle 2010; Kiffney et al. 2003; Groom et al. 2011 (a); Groom et al. 2011 (b); Jones et al. 2006; Sweeney & Newbold 2014; Pollock et al. 2009; Wigington et al. 2006; Poole et al., 2008; Ebersole et al. 2015; Poole & Berman 2001; Newcombe & Jensen 1996).

Logging within riparian areas and wetlands can magnify water quality and hydrology impacts from upland logging (Hicks et al. 1991; Moore & Wondzell 2005). Janisch et al. (2011 and 2012) and Buttle et al. (2009) found that wetlands associated with headwater and low order streams are more common and influential on stream hydrology and water quality than previously realized. Many of the wetlands associated with first order streams are small and fall below the size requirements for protection in relation to timber sales (Janisch et al. 2011; Janisch et al. 2012; Buttle et al. 2009). (Janisch et al. 2012) found streams in headwater catchments with wetlands had larger and more consistent increases in temperature in relation to adjacent logging than did the catchments that did not contain wetlands (Janisch et al. 2012). The authors found that streams with wetlands present in their catchments tended to have streams with finer sediments in their substrates.

Protecting groundwater storage, groundwater flows, and hyporheic flows associated with intermittent streams is crucial for protecting temperatures in larger downstream perennial streams. Cold water inputs from intermittent streams to downstream reaches are essential providing cold water refugia for special-status and imperiled aquatic organisms, including ESA- listed fish (Caissie 2006; Ebersole et al. 2015; Grant & Swanson 1990; Groom et al. 2011 (a); Groom et al. 2011 (b); Jones & Grant 1996; Pollock et al. 2009). Patches of cold water refugia are crucial for fish. Shallow groundwater patterns can be important for influencing stream temperatures (Poole et al. 2008), and so are likely vulnerable to upslope logging (Caissie 2006). **In research in eastern Oregon, Ebersole 2015 found that dry streams supplied cold water to downstream reaches at confluence sites. Such cold water refugia habitats are important for fish, which were observed at these locations.** In the Tiger-Mill area, this is particularly relevant to the many intermittent and headwater streams within the sale area.

Protecting clean, cold waters within the Tiger Mill area is especially important in light of the downstream water quality impairments, such as degraded stream and water quality conditions in

neighboring stream reaches (see description below). It is also important to reiterate, as discussed in more detail above in these comments, that intermittent and headwater streams can and do influence stream temperatures in downstream perennial streams.

The Tiger-Mill Notice of Proposed Action includes the following paragraph: *"Aquatic habitat within streams in the Mill Creek Municipal Watershed are assumed to be in good condition because of the consistently high-water quality at the City of Walla Walla's water supply intake. There has been no formal assessment of post-2020 flood effects to habitat condition. Other streams tributary to Mill Creek (Tiger, West Tiger, China, Webb, Henry Creeks) have degraded habitat and floodplain function because of legacy roads and past timber harvest that have resulted in unnatural channel incision and reduction of habitat complexity and these streams continue to be at risk from high flow events. The upper portions of the Burnt Fork and the Green Fork of the Touchet River are neither as cold nor as un-impacted by human activities as Mill Creek and its tributaries. Historically, these streams hosted the same fish species as Mill Creek, although Chinook salmon probably never went as far upstream as the Forest boundary. Bull trout are less common in these streams, probably because the water is not as cold as Mill Creek."*

We note that the FS admits, in this above paragraph, that logging and roading has produced degraded water quality and stream habitats. Conversely, the FS notes that the Mill Creek Municipal Watershed is comparatively un-impacted by human activities, and also contains the coldest and consistently high water quality. The Municipal Watershed is currently supplying high quality water-- the FS should be protecting the Watershed from the very same impacts (logging, roads) that they admit has degraded water quality in the surrounding stream reaches.

Should this project be implemented, logging is likely to shift current baseline conditions in stream temperatures, including diurnal temperature patterns (as well as loss of shade, increase in stream temperature and sediment, loss of biomass, loss of wildlife habitat). Road-related activities associated with logging, and logging on steep slopes above creeks will negatively affect stream temperatures and stream temperature variability, and will pose large risks to the continued viability of Bull trout and other listed and imperiled aquatic species.

The Tiger Mill sale proposes over 4,000 acres of cable/cable assist logging, including within the Mill Creek Municipal Watershed and the Mill Creek IRA. BMBP's field surveys of recent logging on National Forests in the Blue Mountains uncovered alarming loss of large and old growth trees in relation to cable/cable assist logging. For example, in the recent eastside National Forest sale, the Big Mosquito timber sale (Malheur NF), dozens of large and old Ponderosa pine (many over 200 years old) in one unit were cut down due to being in the way of cable corridors—corridors that seemingly overlapped perfectly with lines of old growth trees, repeatedly. These large and old trees were taken to the mill and sold. When BMBP met with the Forest Service regarding the logging of these large and old trees, we were told that it was simply the result of logging implementation of cable assist logging, and that the results on the ground were in line with what they would consider restoration. Several additional sale units encompassing hundreds of acres of upcoming cable assist logging had not yet been implemented, but will put hundreds more old

growth trees, including old growth Ponderosa pines, at risk of logging. Please see example pictures below. Additional pictures are available on BMBP's website, including detailed documentation of tree ring counts showing the age of approximately 30 Ponderosa pines that were 150 years or older when cut. What are the silvicultural prescriptions for the Tiger-Mill sale? Do they allow for similar outcomes?

How many large and old trees would be cut as a result of road construction, rebuilding, repair, hazard tree falling, cable logging/cable assist corridors, landings, and other logging infrastructure, should this sale be implemented? Will old growth trees, legacy snags, and clumps of snags be buffered? How will this affect watershed hydrology, water quality including excess fine sediment in streams, LWD recruitment, stream structure, and wildlife habitat? In both the uplands and within RHCAs? Such information should be included in the environmental analysis or environmental impact statement.

Given the discrepancies between what the Forest Service has depicted as "thinning" and some of the logging of mature and old Ponderosa pines we found on the ground in recent sales—it is more important than ever that the public is able to field survey timber sales, both before and after logging. Commercial logging in areas that are generally off limits to the public, such as in the Mill Creek Municipal Watershed should not occur due to public transparency issues, as well as all of the aquatic and ecological concerns we have raised throughout our comments.

The Forest Service included a picture of a washout related to recent fire activity. However, the FS tends to minimize or ignore the extensive and well-documented erosion and sedimentation related to logging, which is often more persistent and widespread on the landscape. Below is an example of erosion related to past logging and adverse impacts to soils and water drainage within the South George project area on the Umatilla NF (these were taken prior to logging implementation in South George).

Is logging for biomass proposed as part of the Tiger-Mill sale? If so, what silvicultural prescriptions would be associated with this logging? Where would the biomass processing take place, and how far away would those logs need to be transported?

We're very concerned that proposed logging, including thinning and burning within the RHCAs, and proposed road-related activities, will retard attainment of RMOs and violate PACFISH/INFISH. Such activities will also violate the Municipal Watershed agreement and harm drinking water quality. This sale, should it be implemented, would harm watershed conditions, not improve them. The Forest Service has not presented evidence that the logging, burning and the associated road building as described in this project would benefit RMOs, water quality, in-stream habitat structure, fish population trends, or wildlife habitat. Particularly given the plethora of evidence that logging, roading, and burning can harm water quality, watershed hydrology, stream structure, and wildlife, the Tiger-Mill sale as proposed violates the Watershed restrictions mentioned in the FS's Notice of Proposed Action, which "… limits use of the area to activities that benefit water quality."

Please share with the public the existing data with the public for RMOs, including stream temperature and sediment-related water quality parameters. Has the agency shared the water quality information it posses with the Washington Department of Ecology? National Forests in Eastern Oregon have a poor track record of transparency with sharing water quality data with regulatory agencies or the public. Are the streams within the Tiger-Mill project area meeting Forest Plan and state water quality standards?

National Forests in the Pacific Northwest region support numerous unique aquatic species that are dependent on clean, cold water. Examples include Bull trout, native salmon and trout, amphibians such as tailed frogs, lamprey, macroinvertebrates including sensitive caddisflies, and many others. Many of these cold-water dependent aquatic species have lost much of their ranges and populations due to water quality degradation, primarily in the form of excess fine sediments and increased stream temperatures. Many stream temperatures on public lands in the Blue Mountains are limiting or lethal to sensitive fish and other aquatic organisms. Excess fine sediments can clog gills; fill in stream bed habitats that organisms live in and rely on; bury eggs; and interfere with feeding, mating, and other life cycle needs. We are very concerned about sensitive aquatic species within these streams, and the threats posed to them by logging, burning, and roading as proposed in the Tiger-Mill project.

The ecological risks of wildfire are overstated in the FS's Notice of Proposed Action, with little recognition that these forests evolved with mixed severity wildfire (including high severity fire) and rely on wildfire for many ecosystem processes. In addition, native trout and salmonids also evolved with wildfire and other disturbances in the PNW and-- provided their populations are not too fragmented and impacted by logging and roads-- recover fairly quickly from wildfire. For example, the USFS proposed Forest Plan Revision (2014) vol 2. pg 60 noted: **"***Redband trout and bull trout have been shown to recolonize severely burned drainages within two years, provided the drainages were physically accessible (i.e., no culvert barriers, and provided that other fish in unburned areas were close enough to discover and move back into the recently burned habitat."* Logging and roads pose greater threats to forests, aquatic habitats, and imperiled fish than wildfire.

Effects of logging (including thinning) on aquatic systems can be hard to detect despite being persistent, long-lasting, and negative. For example, the Draft Forest Plan Revision for the Blue Mountains (vol. 2 pg. 48): "Timber harvest can influence aquatic ecological condition via such activities as removal of trees in the riparian zone, removal of upslope trees, and associated understory or slash burning (Hicks et al. 1991). These activities can affect wood recruitment, stream temperatures, erosion potential, stream flow regime, and nutrient runoff, among others (Hicks et al. 1991). Effects of harvest are likely to be different at different scales. Hemstad and Newman (2006) found few effects of harvest at the site or reach scale, but **found that harvest five to eight years earlier resulted in losses of habitat quality and species diversity at the scale of a stream segment (larger than a reach) or at the subwatershed level. Those losses were revealed in terms of increases in bank instability and fine sediment throughout the watershed and increased water temperatures and sediment problems throughout the channel segment. The cumulative effects of widespread harvest within a single drainage in a short period of time resulted in deterioration of the aquatic and riparian habitats, but evidence of effects lagged harvest by several years and different evidences of deterioration showed up at different spatial scales within the watershed".**

Timber harvest, grazing, and the synergistic impacts of the two activities combined have significant negative impacts on aquatic habitats. From NOAA 5-Year Review of Snake River Salmonids:

> "Information from the [PACFISH Biological Opinion Monitoring Program] PIBO monitoring program indicates that unmanaged or reference reaches (streams in watersheds with little or no impact from road building grazing, timber harvest, and mining) on Federal lands in the Interior Columbia basin (including the Snake River basin) are in better condition than managed streams (Al-Chockhachy et al. 2010b). In particular, managed watersheds with high road densities or livestock grazing tend to have stream reaches with worse habitat conditions than streams in reference watersheds. When roads and grazing both occur in the same watershed, the presence of grazing has an additional significant negative effect on the relationship between road density and the condition of stream habitat (Al-Chockhachy et al 2010b)."

Are there overlapping livestock grazing allotments within the sale area? We are very concerned about the cumulative effects of this sale in combination with other past and ongoing impacts from management, including grazing.

In addition, research indicates that existing regulations may not adequately protect fish viability. This strongly implies that we need to take into account even more subtle and nuanced effects from land management on stream temperature. For example, the study Key findings for Stream Temperature Variability: Why It Matters To Salmon by Steele, A. and Beckman, B. (2014) at the Pacific Northwest Research station include: "Commonly used degree-day accumulation model is not sufficient to predict how organisms respond to stream temperatures. Changes in how the degree days are delivered have the potential to alter the timing of life history transitions in Chinook salmon and other organisms. Emerging from the gravel a few days earlier or later could directly affect their survival due to changes in available food resources, competition for feeding grounds, or strong currents". Best Management Practices need to be reevaluated and modified to ensure that stream temperature variability is not altered beyond thresholds for at-risk and aquatic species. It is likely that logging on steep slopes adjacent to streams that support Bull trout will affect stream temperature variability as well as average stream temperatures– and poses large risks to the continued viability of sensitive fish and aquatic species.

The Steele and Beckman (2014) study demonstrates that organisms are more sensitive to subtle and hard to measure changes or shifts in their environments—much more so than is commonly appreciated or than agency monitor protocols account for. The standards and guidelines we have in place are currently insufficient to protect the viability of many sensitive species such as salmon. Allowing for extensive logging in sensitive management areas such as the Mill Creek Municipal Watershed, Mill Creek IRA, and Natural Research Area is extremely likely to shift baseline conditions in a harmful direction (increase in stream temperature and sediment, degradation of RMOs, loss of biomass, loss of wildlife habitat).

All proposed logging and burning in areas such as the Mill Creek Municipal Watershed, Mill Creek IRA, and Natural Research Area should be dropped. Fish stocks are stronger and better distributed in areas of little or no management and low road densities, even in fire suppressed areas, and even if severe fires occur. Numerous studies and reports show that many benefits are gained by leaving forests unroaded, and to their own ecological processes (including processes involving fire, insects, and disease). (Bader 2000, Bradley et al. 2002, DellaSala et al. 2011, Frissell and Carnefix 2007,

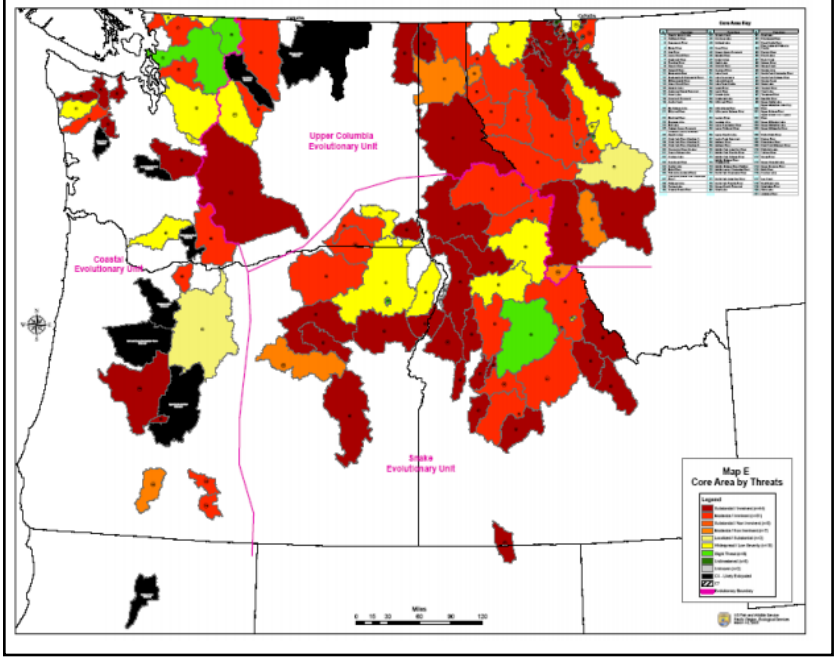
Public Lands Initiative 2004, Reiman and Clayton 1997, Reiman et al. 2000, Thurow et al. 2001, Public Lands Initiative/Trout Unlimited 2004, Western Native Trout Campaign 2001).

An assessment of the interior Columbia Basin ecosystem revealed that increasing road densities were associated with declines in four nonanadromous salmonid species (bull trout, Yellowstone cutthroat trout (Oncorhyncus clarkii bouvieri), westslope cutthroat trout (O. c. lewisi), and redband trout (O. mykiss spp.)) within the Columbia River basin, likely through a variety of factors associated with roads. Bull trout were less likely to use highly roaded basins for spawning and rearing and, if present in such areas, were likely to be at lower population levels (Quigley and Arbelbide 1997, p. 1183). These activities can directly and immediately threaten the integrity of the essential physical or biological features described in PCEs 1 through 6."

Carnefix and Frissell (2009) discussed impacts from roads, and show that significant negative impacts to sensitive aquatic species such as Bull trout are present at road densities greater than one mile per square mile: "Multiple, convergent lines of empirical evidence summarized herein support two robust conclusions: 1) no truly "safe" threshold for road density exists, but rather negative impacts begin to accrue and be expressed with incursion of the very first road segment; and 2) highly significant impacts (e.g., threats of extirpation of sensitive species) are already apparent at road densities on the order of 0.6 km per square km (1 mile per square mile) or less.

Below is a map of Bull trout core areas with threat category from the USFWS. The map shows that in the Umatilla, Malheur, and Wallowa-Whitman National Forests, Bull Trout face substantial or imminent threat on 6 core areas, and widespread, substantial or moderate non- imminent threat on 4 areas, and low-severity threat on 3 core areas (USFWS 2008).

Figure 4. Map of Core Areas by Threat Category (dark red=substantial, imminent threat; light red=moderate, imminent threat; dark orange=substantial, non-imminent threat; light orange=moderate, non-imminent threat; dull yellow=localized, substantial threat; bright yellow=widespread, low-severity threat; light green=slightly threatened; dark green=unthreatened; gray=unknown; black=likely extirpated).



Bull trout are at risk throughout most of their range, and are at "imminent risk" of extinction in the area that overlaps with the Tiger-Mill project. What are current Bull trout population trends? What are the trends for other sensitive imperiled aquatic species? Population size? What are the trends for Chinook salmon, Steelhead, and Redband? Population sizes? Were reintroduction efforts successful? What additional Sensitive or Threatened-listed species, and MIS aquatic species, are present in the project area?

In addition, in order to provide for Bull trout recovery, it is imperative that they are able to recolonize past occupied habitat. Ensuring that habitat remains suitable for Bull trout is important for ongoing and future recovery efforts, including potential reintroduction efforts.

Is the Forest Service planning to consult with NMFS/NOAA or the USFWS on possible effects to species such as Bull trout and steelhead in relation to logging, roading, and burning proposed in this sale?

Climate change

While the FS's Notice of Proposed Action for the Tiger-Mill sale includes discussion on climate-driven wildfire, the FS fails to acknowledge that logging and "fuel reduction" does little to nothing to stop climate change related wildfires, which are overwhelmingly driven by drought, heat, and wind. Logging in the backcountry will not make communities safer—working near communities, home hardening, and emergency preparedness are far more effective in keeping people safe. Please see the research of Dr. Jack Cohen, a Forest Service researcher who has done decades of work on this topic.

The Tiger-Mill sale, and other recent and current FS sales, will increase C02 emissions and contribute to climate change-- thus exacerbating the warming stream temperatures, lower base flows, and other ecological harm caused by climate change. Logging and roading further exacerbates the negative effects caused by climate change.

For example, Jones & Grant (1996) found that watersheds with drier conditions and more intense summer droughts were more sensitive to the effects of logging and roads on increased peak flows. Logging to increase base flows has been widely cautioned against, and is unpredictable and unlikely to increase base flows during the lowest flow periods or for the long-term. In combination with climate change, unintended negative effects may have severe consequences.

Global climate change is a massive, unprecedented threat to humanity and forests. Climate change is caused by excess CO 2 and other greenhouse gases transferred to the atmosphere from other pools. All temperate and tropical forests, including those in this project area, are an important part of the global carbon cycle. There is significant new information reinforcing the need to conserve all existing large stores of carbon in forests, in order to keep carbon out of the atmosphere and mitigate climate change. The agency must do its part by managing forests to maintain and increase carbon storage. Logging would add to cumulative total carbon emissions so is clearly part of the problem, so it must be minimized and mitigated. Logging would not only transfer carbon from

storage to the atmosphere but future regrowth is unlikely to ever make up for the effects of logging, because carbon storage in logged forests lags far behind carbon storage in unlogged forests for decades or centuries.

Forests are carbon sinks—they store carbon in both the soils and the vegetation. Carbon sinks are important for mitigating the impacts of climate change. The U.S. has many forests owned by the public and managed by the Forest Service. Harvesting wood "represents the majority of [carbon] losses from US forests...." (Harris et al., 2016). Additionally, (Achat et al., 2015) has estimated that intensive biomass harvests could constitute an important source of carbon transfer from forests to the atmosphere. Pacific Northwest forests hold live tree biomass equivalent or larger than tropical forests. (Law and Waring, 2015). "Alterations in forest management can contribute to increasing the land sink and decreasing emissions by keeping carbon in high biomass forests, extending harvest cycles, reforestation, and afforestation." (Law et al., 2018). The FS omits an honest carbon accounting of the carbon outputs of this project.

(Buotte et al., 2019) published an article prioritizing forest lands for preservation based on "carbon priority ranking with measures of biodiversity." This is important information that the Forest Service should consider in its analysis. The researchers mapped "high carbon priority forests in the western US exhibit features of older, intact forest with high structural diversity[], including carbon density and tree species richness." Here is the map from that article:

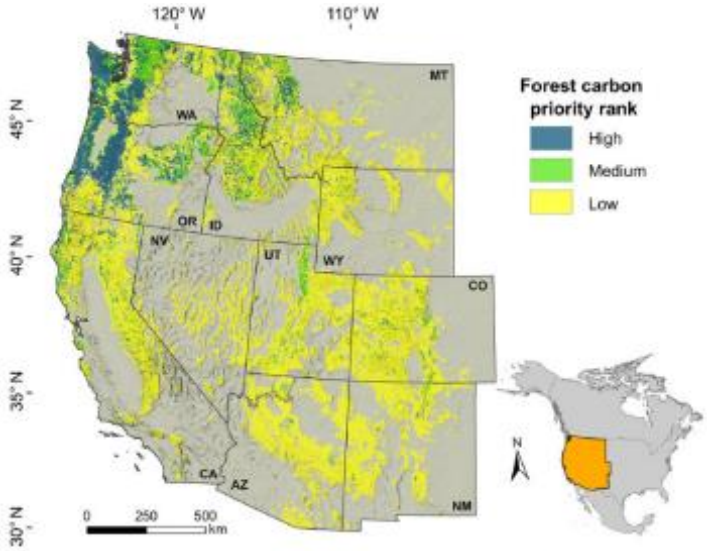


FIG. 1. Forested land in the western conterminous United States classified into priority for preservation to mitigate climate change based on the spatial co-occurrence of low vulnerability to drought and fire and low, medium, and high potential carbon sequestration. WA, Washington; ID, Idaho; MT, Montana; OR, Oregon; CA, California; NV, Nevada; UT, Utah; CO, Colorado; AZ, Arizona; NM, New Mexico.

Over the last several decades, forest managers in North America have used concepts of historical range of variability, natural range of variability, and ecological sustainability to set goals and inform management decisions. An underlying premise in these approaches is that by maintaining forest conditions within the range of pre-settlement conditions, managers are most likely to sustainably maintain forests into the future. We argue that although we have important lessons to

learn from the past, we cannot rely on past forest conditions to provide us with adequate targets for current and future management. This reality must be considered in policy, planning, and management. Climate variability, both naturally caused and anthropogenic, as well as modern land-use practices and stressors, create novel environmental conditions never before experienced by ecosystems. Under such conditions, historical ecology suggests that we manage for species persistence within large ecoregions.

Large trees are especially important for carbon storage. On National Forest lands east of the Cascade Crest in Oregon and Washington, large trees equal to or over 21" in diameter at breast height comprise only ~3% of trees-- yet store ~42% of the carbon. (Mildrexler et al. 2020).

(Mildrexler, et al., 2020) state:

- Large-diameter trees store disproportionally massive amounts of carbon and are a major driver of carbon cycle dynamics in forests worldwide.
- We examined the proportion of large-diameter trees on National Forest lands east of the Cascade Mountains crest in Oregon and Washington, their contribution to overall aboveground carbon (AGC) storage, and the potential reduction in carbon stocks resulting from widespread harvest. We analyzed forest inventory data collected on 3,335 plots and found that large trees play a major role in the accumulated carbon stock of these forests. Tree AGC (kg) increases sharply with tree diameter at breast height (DBH; cm) among five dominant tree species. Large trees accounted for 2.0 to 3.7% of all stems (DBH ≥ 1" or 2.54 cm) among five tree species; but held 33 to 46% of the total AGC stored by each species. Pooled across the five dominant species, large trees accounted for 3% of the 636,520 trees occurring on the inventory plots but stored 42% of the total AGC. A recently proposed large-scale vegetation management project that involved widespread harvest of large trees, mostly grand fir, would have removed ~44% of the AGC stored in these large-diameter trees, and released a large amount of carbon dioxide into the atmosphere.
- Given the urgency of keeping additional carbon out of the atmosphere and continuing carbon accumulation from the atmosphere to protect the climate system, it would be prudent to continue protecting ecosystems with large trees for their carbon stores, and also for their co-benefits of habitat for biodiversity, resilience to drought and fire, and microclimate buffering under future climate extremes.

Given that large trees over 20" dbh are still rare on the landscape compared to historic norms, logging these trees only hurts carbon storage, as well as key wildlife habitat that is still at a deficit in the region, and biodiversity. Large trees are also essential to watershed health and stream, and logging large trees will negatively affect stream habitats and water quality. Logging large trees over 21" dbh will not make communities safer from wildfire, and will not make a meaningful difference in the FS achieving their tree species composition/forest conversion goals. It will however, negatively affect carbon storage and wildlife habitat in meaningful and harmful ways. Logging, particularly the logging of large trees, does not address the primary problems and sources of ecological degradation on the landscape—too many roads and roads that are harming water quality and wildlife, excess fine sediment and high stream temperatures, and invasives species.

The FS fails to consider how climate change is already, and is expected to be even more in the future, influencing forest ecology. This has vast ramifications as to whether or not the forest in the project area will respond as the FS assumes.

Global warming and its consequences are effectively irreversible which implicates certain legal consequences under NEPA and NFMA and ESA (e.g., 40 CFR § 1502.16; 16 USC §1604(g); 36 CFR §219.12; ESA Section 7; 50 CFR §§402.9, 402.14). All net carbon emissions from logging represent "irretrievable and irreversible commitments of resources."

The Committee of Scientists, 1999 recognize the importance of forests for their contribution to global climate regulation. Also, the 2012 Planning Rule recognizes, in its definition of Ecosystem services, the "Benefits people obtain from ecosystems, including: (2) Regulating services, such as long term storage of carbon; climate regulation..."

Climate change science suggests that logging for sequestration of carbon, logging to reduce wild fire, and other manipulation of forest stands does not offer benefits to climate. Rather, increases in carbon emissions from soil disturbance and drying out of forest floors are the result. The FS can best address climate change through minimizing development of forest stands, especially stands that have not been previously logged, by allowing natural processes to function. Furthermore, any supposedly carbon sequestration from logging are usually more than offset by carbon release from ground disturbing activities and from the burning of fossil fuels to accomplish the timber sale, even when couched in the language of restoration. Reducing fossil fuel use is vital. Everything from travel planning to monitoring would have an important impact in that realm.

There is scientific certainty that climate change has reset the deck for future ecological conditions. For example, (Sallabanks, et al., 2001): (L)ong-term evolutionary potentials can be met only by accounting for potential future changes in conditions. ...Impending changes in regional climates ...have the capacity for causing great shifts in composition of ecological communities.

We want to highlight several recent studies and articles have been published in relation to climate change and forests, including papers on forest reserve strategies that include the Blue Mountains:

2022: DellaSala et al. Have western USA fire suppression and megafire active management approaches become a contemporary Sisyphus?

2022: Ripple et al. World Scientists' Warning of a Climate Emergency

Dec 2022: Law et al. Strategic reserves in Oregon's forests for biodiversity, water and carbon to mitigate and adapt to climate change. *Front. Forests & Global Change* link

Aug 2022: Law & Schlesinger. Why mature and old forests are so important for climate mitigation and adaptation. *The Hill* link

Jul 2022: Law. Boreal and Temperate Forests. In: The Climate Book by Greta Thunberg. link

May 2022: Law et al. Creating Strategic Reserves to protect forest carbon and reduce biodiversity loss in the United States. *Land* link

Dec 2021: Law et al. Strategic Forest Reserves can protect biodiversity and mitigate climate change in the western US. *Nature Comm Earth & Environ*. link

Additional discussion on forest ecology, wildfire, logging, and prescribed burning:

Several studies suggests that numerous species are more negatively affected by thinning than by wildfire. Example include Olive-sided flycatchers, lynx, Pacific fisher, Spotted owls, flying squirrels, and other species. Robertson and Hutto (2007) provide evidence for the harmful effects of thinning to some species in their study *Is selectively harvested forest an ecological trap for Olive-sided flycatcher?* The authors state that:

"Human activities that closely mimic the appearance but not the fundamental quality of natural habitats could attract animals to settle whether or not these habitats are suitable for their survival or reproduction. We examined habitat selection behavior and nest success of Olive-sided Flycatchers (Contopus cooperi) in a naturally occurring burned forest and an anthropogenically created habitat type—selectively harvested forest. Olive-sided Fly- catcher density and nestling provisioning rates were greater in the selectively harvested landscape, whereas estimated nest success in selectively harvested forest was roughly half that found in naturally burned forest. Reduced nest success was probably a result of the relatively high abundance of nest predators found in the artificially disturbed forest. **These results are consistent with the hypothesis that selectively harvested forest can act as an "ecological trap" by attracting Olive-sided Flycatchers to a relatively poor-quality habitat type. This highlights the importance of considering animal behavior in biodiversity conservation."**

We note that the Forest Service does not have a legal mandate to manage forests for HRV. They are, however, responsible for ensuring the viability of species such as Bull trout and other ESA-listed species, as well as upholding water quality standards. We are very concerned that the FS is myopically focused on shifting tree species composition and structure, rather than on protecting values such as native species and water quality. We are concerned about issues such as the likely loss of snags, downed wood, and other key wildlife habitat. We are also concerned that the FS's answer to native diseases or pests that serve ecological functions is ecologically destructive logging (i.e., in relation to mistletoe, laminated root rot, native bark beetles, etc.). Logging is often included in timber sales, even if the primary rationale of the sales is HRV/wildfire related.

We also have concerns about prescribed fire, particularly landscape-scale prescribed fire in sensitive or remote areas (RHCAs, IRAs, etc.) that historically burned with mixed severity, including high severity. The FS also does not seem to account for the dynamic nature and natural variability and complexity of the landscape, or for fire refugia. Also, prescribed fires should not take place in the spring, as the potential to harm nesting birds, butterflies, and other species who are nesting or reproducing at that time is high.

Pilliod et al. 2006 examined potential unintended negative effects on wildlife and habitats due to thinning and prescribed fire. We are concerned that similar negative effects on wildlife and habitats will occur in the widespread logging in riparian corridors. For example, we are concerned about possible losses of snags and dead wood (both in direct response to the project and decreased future recruitment), negative effects on density-and closed canopy-dependent species, negative effects on alpha and beta biodiversity, declines in mammal populations, and other unintended negative effects on the flora and fauna and habitats in the project area. Highlights from their study include:

> "Large-scale prescribed fires and thinning are still experimental tools in ecological restoration (box 1), and unanticipated effects on biodiversity, wildlife and invertebrate populations, and ecosystem function may yet be discovered (Allen and others 2002; Carey and Schumann 2003)."
>
> "Species that prefer closed-canopy forests or dense understory, and species that are closely associated with those habitat elements that may be removed or consumed by fuel reductions, will likely be negatively affected by fuel reductions. Some habitat loss may persist for only a few months or a few years, such as understory vegetation and litter that recover quickly. The loss of large-diameter snags and down wood, which are important habitat elements for many wildlife and invertebrate species, may take decades to recover…."
>
> "Wildlife and invertebrate species that depend on down wood, snags, dwarf mistletoe (Arceuthobium spp.) brooms, dense forests with abundant saplings and small poles, and closed-canopy forests for survival and reproduction are likely to be detrimentally affected by fuel treatments that alter these habitat elements"
>
> "Implementation of any thinning or prescribed burning is likely to result in loss of snags, future snags, and down wood that are important stand attributes of healthy forests and critical components of wildlife and invertebrate habitat"
>
> Loss of large-diameter snags and down wood can take years to decades to recover, as indicated by wildland fire research (Passovoy and Fule 2006)."
>
> "There is a great need for long-term observational and preferably experimental studies on the effects of a range of fuel reduction treatments at multiple spatial scales (stand or larger)."

Numerous studies have found negative impacts on wildlife habitats from thinning in riparian areas, even when snags removal is not intended. For example, Pollock et al. (2012) found that selective

logging may cause riparian forests to develop characteristics outside of normal late seral conditions in reference stands. Pollock and Beechie (2014) study found that:

> "Because far more vertebrate species utilize large deadwood rather than large live trees, allowing riparian forests to naturally develop may result in the most rapid and sustained development of structural features important to most terrestrial and aquatic species".

The August 2017 "Science Findings" from the PNW Research Station discussed the importance of snags and wildfire, and found that many more snags are needed than current regulations or standards provide for. Riparian forests are disproportionately used by wildlife and birds, and so these findings are particularly relevant to Riparian Reserves. The Science Findings note: *"Currently, the best solution we can recommend is to provide large numbers of snags for the birds, which can be difficult without fire," According to the researchers' calculations, if one of every 20 snags (approximately 4 percent) has suitable wood, and there are five to seven species of woodpeckers nesting in a given patch, approximately 100 snags may be needed each year for nesting sites alone. This does not account for other nuances, like the fact that most species are territorial and will not tolerate close neighbors while nesting, or the fact that species like the black-backed woodpecker need more foraging options. Overall, more snags are needed than other studies have previously recommended. Based on their results, Lorenz and her colleagues see the critical role that mixed-severity fires play in providing enough snags for cavity-dependent species. Low-severity prescribed fires often do not kill trees and create snags for the birds. "I think humans find low-severity fires a more palatable idea. Unfortunately or fortunately, these birds are all attracted to high-severity burns," Lorenz says. "The devastating fires that we sometimes have in the West almost always attract these species of birds in relatively large numbers."*

The following quotes are from August 2017 "Science Findings" from the PNW Research Station:

- In dry forests, a mixed-severity fire that kills trees is an important but underappreciated strategy for providing enough snags for cavity-dependent species. Low-severity prescribed fires may not provide enough snags for these species.

- Suitable snags are limited, such that snag availability drives landscape-level habitat selection by some species. For example, white-headed woodpeckers selected severely burned patches for nesting, which was initially puzzling because this species does not characteristically forage in burns.

- Within burns used by at-risk woodpeckers, the majority (86 to 96 percent) of seemingly suitable trees contained unsuitably hard wood; wood hardness limits nest site availability for these declining species.

- This suggests that past studies that did not measure wood hardness counted many sites as available to cavity-excavating birds when actually they were unsuitable. "By not accounting for wood hardness, managers may be overestimating the amount of suitable habitat for cavity-excavating bird species, some of which are at risk," Lorenz says.

- "Based on their results, Lorenz and her colleagues see the critical role that mixed-severity fires play in providing enough snags for cavity-dependent species. Low-severity prescribed fires often do not kill trees and create snags for the birds. "I think humans find low-severity fires a more palatable idea. Unfortunately or fortunately, these birds are all attracted to high-severity burns," Lorenz says. "The devastating fires that we sometimes have in the West almost always attract these species of birds in relatively large numbers." Many studies have shown that a severely burned forest is a natural part of western forest ecosystems. Snags from these fires attract insects that love to burrow beneath charcoal bark. And where there are insects, there are birds that love eating these insects. Lorenz and her colleagues stress that providing snags that woodpeckers can excavate is crucial for forest ecosystem health in the Pacific Northwest, where more than 50 wildlife species use woodpecker-excavated cavities for nesting or roosting."

The Forest Service claims that Douglas and Grand firs and other less fire-resistant trees are present in larger numbers and higher densities across the landscape than they were historically, as a consequence of fire suppression. However, the Forest Service abuses this rationale by applying it overly broadly and aggressively, and uses it as an excuse to extensively log old growth and mature forests– including in ecologically inappropriate areas such as forests with ample evidence of historic mixed-conifer and high-density forests, on north and east facing slopes; deep gulches and narrow valleys; forests on soils that hold more nutrients and moisture (such as ash soils); and other areas that show historic evidence of supporting mixed-conifer forests in general and Grand fir in particular. The Forest Service is using flawed assumptions that lack adequate scientific backing in order to log in ecologically inappropriate and sensitive areas, and to large trees across many thousands of acres—despite the documented deficit in large trees across the landscape and their importance to wildlife.

A recent study from Bradley et al. (2016) challenges USFS assumptions about the fire risk associated with more protected areas—those area that have been less-managed or less-logged, but may still have experienced some degree of fire exclusion (such as Wilderness areas. riparian corridors have also, of course, seen much more protection than upland areas). The authors state:

"There is a widespread view among land managers and others that the protected status of many forestlands in the western United States corresponds with higher fire severity levels due to historical restrictions on logging that contribute to greater amounts of biomass and fuel loading in less intensively managed areas, particularly after decades of fire suppression. This view has led to recent proposals—both administrative and legislative—to reduce or eliminate forest protections and increase some forms of logging based on the belief that restrictions on active management have increased fire severity. We investigated the relationship between protected status and fire severity using the Random Forests algorithm applied to 1500 fires affecting 9.5 million hectares between 1984 and 2014 in pine (Pinus ponderosa, Pinus jeffreyi) and mixed-conifer forests of western United States, accounting for key topographic and climate variables. **We found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading. Our results suggest a need to reconsider current overly simplistic assumptions about the relationship between forest protection and fire severity in fire management and policy"**

"Protected forests burn at lower severities: We found no evidence to support the prevailing forest/fire management hypothesis that higher levels of forest protections are associated with more severe fires based on the RF and linear mixed-effects modeling approaches. On the contrary, using over three decades of fire severity data from relatively frequent-fire pine and mixed-conifer forests throughout the western United States, we found support for the opposite conclusion—burn severity tended to be higher in areas with lower levels of protection status (more intense management), after accounting for topographic and climatic conditions in all three model runs. Thus, we rejected the prevailing forest management view that areas with higher protection levels burn most severely during wildfires."

Odion et al. (2014) noted, based on extensive literature review of landscape-scale evidence of historical fire severity patters in Ponderosa pine and mixed conifer forests:

"There is widespread concern that fire exclusion has led to an unprecedented threat of uncharacteristically severe fires in ponderosa pine (Pinus ponderosa Dougl. ex. Laws) and mixed-conifer forests of western North America. These extensive montane forests are considered to be adapted to a low/moderate-severity fire regime that maintained stands of relatively old trees. **However, there is increasing recognition from landscape-scale assessments that, prior to any significant effects of fire exclusion, fires and forest structure were more variable in these forests. Biota in these forests are also dependent on the resources made available by higher-severity fire."**

"… most forests appear to have been characterized by mixed-severity fire that included ecologically significant amounts of weather-driven, high-severity fire."

"….paleoecological studies also support mixed-severity fire regimes for the ponderosa pine and mixed-conifer forests. These studies have found charcoal depositions from major fire episodes in ponderosa pine and interior Douglas-fir forests occurring for millennia in the northern Rockies (central Idaho: [100,101]), Klamath [102], Sierra Nevada [103], eastern Oregon Cascades [104], and southwestern USA [105–107]. **These major episodes are generally interpreted as large, severe fire events [101– 107].**

"The high-severity fire rotations […] do not support the hypothesis that low/moderate-severity fire regimes were predominant in the majority of ponderosa pine and mixed-conifer forests of western North America. In all the large, forest landscapes for which data covering at least 70 years exist, high-severity fire rotations ranged from about 217 to 849 years [57], and were mostly 200–500 years. This is generally less than potential tree lifespans. For combined moderate- and high-severity fires in the eastern Cascades, rotations were 115–128 years"

"The majority of the evidence did not support the low/moderate-severity fire hypothesis, but, instead, supported the alternate hypothesis that mixed-severity fire shaped these forest landscapes. This finding applies to Pacific states ponderosa pine, Jeffrey pine, and California mixed-conifer forests, as well as ponderosa pine and mixed-conifer forests in the eastern Cascades, Rockies and southwestern USA, where low/moderate-severity regimes have often been applied."

"In addition, patch sizes of high severity fire in the central Rockies have not increased [58]. Our assessment of high-severity rotations based upon existing literature also revealed a generally lower incidence of high-severity fire in these forests in recent decades…"

"Based on direct observations of fire behavior, high winds (generally 10 m open wind speeds .32–35 kilometers/hr) may subject virtually any conifer forest, regardless of fuel density, to crown fire [108]. Thus, empirical data call into question a major premise of the low/moderate-severity fire regime: that ponderosa pine and mixed-conifer forests may be completely resistant to crown fire. Fire intensity increases with winds, and at winds of .30 km/hr spot fires may be ignited over 1 km ahead of the fire front [109]. The coalescing of separate spot fires with the fire front can further energize wind-driven fire [110,111]. Severe droughts also intensify fires by reducing fuel moisture to extremely low levels, allowing crown fire under less windy conditions [108,112]. Severe drought years throughout much of western North America occurred from 1856 to 1865, 1870 to 1877 and 1890 to 1896 [113]. The extensive high-severity fires of 1910 (the Big Burn in Idaho and Montana), when large areas of drier forests burned at high severity prior to fire exclusion–much of it in ponderosa pine–illustrate how fire behavior that is rare temporally due to extreme climate and weather can dominate in space [1]. Many fire episodes in the charcoal records that exceed modern fires undoubtedly involve combinations of extreme wind, drought, and mass fire."

"The importance of multiple lines of evidence has been stressed in determining whether mixed-severity fire regimes applied historically [122]. **Our results illustrate broad evidence of mixed-severity fire regimes in ponderosa pine and mixed-conifer forests of western North America. Prior to settlement and fire exclusion, these forests historically exhibited much greater structural and successional diversity than implied by the low/moderate-severity model"**

"To improve clarity in communication, we propose that ''low/ moderate-severity'' be applied to those regimes where, as the term implies, high-severity fire is absent. These circumstances appear to be quite rare in the ponderosa pine and mixed-conifer forests of western North America. Therefore, a fire regime with a high-severity component of any amount should not be classified as low/moderate-severity"

"Our findings suggest a need to recognize mixed-severity fire regimes (Table 2) as the predominant fire regime for most of the ponderosa pine and mixed-conifer forests of western North America"

Evidence that Mixed-severity fires are still within historic range of variability in the west is also provided by the research of Pierce and Meyer (2008). They examined the size and frequency of fire-related debris flows within alluvial fans in Idaho dating back approximately 2,000 years. They found that evidence of small frequent fires historically coincided with multi-decadal climatic cycles of greater moister or drought, and that larger fires corresponded to drought cycles. Today's high severity fires were found to be within natural range of variability.

In addition, data from the USFS National Report on Sustainable Forests (2010) shows that fire extent was much more prevalent than today across the US:

Hessberg et al. (2007) found that historically mixed-conifer forests were dominated by dense forests. Many of the mixed conifer forests in the region are closed canopy forests that are highly

interwoven complex ecosystems that provide high quality habitat for numerous species such as goshawk, marten, Pileated, Lewis woodpecker, and others. Much peer-reviewed scientific research on mixed- conifer forests has suggested that thinning is likely not needed, effective, nor ecologically beneficial in moist mixed-conifer forest to prevent fire, does not mimic the complex natural fire regime (Noss et al, 2006; Lindenmayer et al. 2009) and threatens to increase fire risk (Lindenmayer et al. 2009). The moist, mixed forest type is fragile and vulnerable to the chronic negative impacts of industrial commercial logging. Mature and old-growth moist mixed conifer stands have dense, moist interiors and little wind, which inhibit the spread of wildfire (Lindenmayer et al. 2009; Morrison and Smith, 2005; Rhodes, 2007). Large fires are climatically driven and fuels reduction treatments can be insignificant to prevent fire spread under these conditions. However, the post-fire habitat is significantly degraded by the logging that happens in the name of fuels reduction prior to the fire. Noss et al. 2006 noted:

"One barrier to better use of ecological science is that individuals involved in developing fire policies and practices have tended to be specialists in fire and fuel management, not ecologists, conservation biologists, or other broadly trained scientists. It is not surprising, therefore, that current forest law does not adequately incorporate ecological considerations in its implementation and tends to promote a narrow definition of restoration that focuses almost exclusively on fuels (DellaSala et al. 2004; Schoennagel et al. 2004)."

"True ecological restoration requires the maintenance of ecological processes, native species composition, and forest structure at both stand and landscape scales. Because forests are highly variable over space and time, few universal principles exist for integrating insights from ecology and conservation biology into fire management policies. Nevertheless, one fundamental principle is that managed forests should not only support the desired fire regime but also viable populations of native species in functional networks of habitat (Hessberg et al. 2005). A common-sense conservation goal is to achieve forests that are low maintenance and require minimal repeated treatment. With time, in a landscape of sufficient size, the right end of the restoration continuum (Figure 4) could be reached, where natural fire maintains the system in the desired state. Indeed, wildland fire use is the cheapest and most ecologically appropriate policy for many forests. We envision a future where fire is seen by land managers and the public as the key to healthy forests, but where each forest and each patch of the forest mosaic is recognized for its individuality and managed accordingly. Above all, a guiding principle of forest management should be a precautionary approach that avoids ecological harm."

Evidence that mixed-severity fires are still within historic range of variability in the west is also provided by the research of Pierce and Meyer (2008). They examined the size and frequency of fire-related debris flows within alluvial fans in Idaho dating back approximately 2,000 years. They found that evidence of small frequent fires historically coincided with multi-decadal climatic cycles of greater moister or drought, and that larger fires corresponded to drought cycles. Today's high severity fires were found to be within natural range of variability.

High intensity wildfires produce unique ecological conditions compared to low intensity fires. High intensity fires are historically natural, and unique, and are integral to the biodiversity of flora and fauna in the region. Favoring lower severity fires across the region in management activities may create unnatural ecological situations that are deleterious to the wildlife, ecological processes,

and biodiversity of the area. An example of the importance of post-fire areas occurring after high intensity fires include the findings of Donato et al. (2008):

"[S]evere fires are typically expected to be deleterious to forest flora and development; however, these results indicate that in systems characterized by highly variable natural disturbances (e.g. mixed-severity fire regime), native biota possess functional traits lending resilience to recurrent severe fire. Compound disturbance resulted in a distinct early seral assemblage (i.e. interval-dependent fire effects), thus contributing to the landscape heterogeneity inherent to mixed-severity fire regimes. Process-oriented ecosystem management incorporating variable natural disturbances, including 'extreme' events such as SI severe fires, would likely perpetuate a diversity of habitats and successional pathways on the landscape."

Williams and Baker have published several studies suggesting that forests in eastern Oregon were considerably more dense than estimates commonly asserted by agencies (Baker 2012; Williams and Baker 2012; and Baker and Williams 2015). There studies have received criticism by some, such as Fule et al. (2014). However, Williams and Baker (2014) provided in-depth responses to these criticisms and clear rationales and defense of their methods; their response was peer-reviewed and published. Their work should not be discounted; rather, it should be considered part of the ongoing conversation and part of the scientific controversy involved in these discussions. Williams and Baker (2014) note:

"Government wildland fire policies and restoration programmes in dry western US forests are based on the hypothesis that high- severity fire was rare in historical fire regimes, modern fire severity is unnaturally high and restoration efforts should focus primarily on thinning forests to eliminate high-severity fire. Using General Land Office (GLO) survey data over large dry-forest landscapes, we showed that the proportion of historical forest affected by high-severity fire was not insignificant, fire severity has not increased as a proportion of total fire area and large areas of dense forest were present historically….. In response, Fulé et al. …suggest that our inferences are unsupported and land management based on our research could be damaging to native ecosystems. Here, we show that the concerns of FE are unfounded. Their criticism comes from misquoting W&B, mistaking W&B's methods, misusing evidence (e.g. from Aldo Leopold) and missing substantial available evidence. We also update corroboration for the extensive historical high-severity fire shown by W&B. We suggest that restoration programmes are misdirected in seeking to reduce all high-severity fire in dry forests, given findings from spatially extensive GLO data and other sources."

The authors respond to each criticism point by point (I encourage people to read it), and then include the following concluding notes:

"The best possible historical baseline for dry forests is likely to come from systematically combining all sources. Past studies that supported the past incomplete historical baseline, which suggested that low-severity fire primarily maintained historical dry forests, were often spatially limited, incomplete samples of larger landscapes. Tree-ring methods can reconstruct to fine scales back to the late 1800s, but are difficult to complete across large landscapes (but see Heyerdahl et al., 2001). Palaeoecological reconstructions can provide key temporal evidence, but are also difficult to replicate across large landscapes. GLO data, in contrast, can be used to develop reconstructions across hundred of thousands to millions of hectares. New findings from GLO data

have challenged past findings about the nature of the historical baseline in dry forests, but it is the role of science to continually test past findings. Refining the historical baseline should help avoid misuse of evidence, false narratives, and misdirected restoration and provide a sound scientific foundation for predicting the effects of climatic change on wildfire and forests."

Through the lens of species presence and evolutionary history

Mixed-severity fires (including high severity fires) create habitat that is necessary for species within the ONF and eastern Oregon, suggesting that high severity fires are natural and historically present, as well as necessary. High severity fires create important habitat that is very high in biodiversity, and may be rare compared to historic norms.

The evolutionary history and very existence of Black-backed woodpeckers suggests that large high-severity fires must regularly occur within their range. We are concerned that current fire suppression efforts (including thinning) through the region will continue to exclude high-severity wildfires (and continue despite project implementation) and threaten the viability of Black-backed woodpeckers and other species that depend on high-severity wildfire. Hutto et al. (2008) noted that:

"Without embracing an evolutionary perspective, we run the risk of creating restoration targets that do not mimic evolutionarily meaningful historical conditions, and that bear little resemblance to the conditions needed to maintain populations of native species, as mandated by law (e.g., National Forest Management Act of 1976)."

"The degree to which the black-backed woodpecker is restricted to burned forest conditions in the intermountain west is truly remarkable. Although this species has been detected outside burned forest conditions, particularly in unburned, beetle-killed forests, the numbers therein are small, and nest success therein is substantially lower than in burned forests (Saab et al. 2005). Neither Powell (2000) nor Morrissey et al. (2008), for example, found any black-backed woodpeckers in surveys of mountain pine beetle-infested mixed-conifer forests even though they located northern flickers and three-toed, hairy, downy, and pileated woodpeckers. Similarly, a regionwide bird survey across a series of unburned, beetle-infested conifer forests within the Forest Service Northern Region (Cilimburg et al. 2006) yielded only two black-backed woodpecker detections (0.46 % of 433 point counts). This is less than one-tenth of the frequency of detection in forests burned 6 yr (Saab et al. 2007), so the probability of a severe fire occurring somewhere within an entire watershed in any given 6-year window is very high. Thus, when viewed on a landscape scale, it becomes easy to imagine that a sufficiently mobile plant or animal species (e.g., fire morel [Morchella angusticeps]; jewel beetle, Buprestidae; blackbacked woodpecker) could become specialized to use a burned forest condition that is ephemeral on a local scale but always present somewhere in the larger landscape."

"…[T]he patterns of distribution and abundance for several other bird species (black-backed woodpecker [Picoides arcticus], buff-breasted flycatcher [Empidonax fulvifrons], Lewis' woodpecker [Melanerpes lewis], northern hawk owl [Surnia ulula], and Kirtland's warbler [Dendroica kirtlandii]) suggest that severe fire has been an important component of the fire regimes with which they evolved. **Patterns of habitat use by the latter species indicate that severe fires are important components not only of higher-elevation and high-latitude conifer forest types,**

which are known to be dominated by such fires, but also of mid-elevation and even low-elevation conifer forest types that are not normally assumed to have had high-severity fire as an integral part of their natural fire regimes. Because plant and animal adaptations can serve as reliable sources of information about what constitutes a natural fire regime, it might be wise to supplement traditional historical methods with careful consideration of information related to plant and animal adaptations when attempting to restore what are thought to be natural regimes."

"In addition, two lines of evidence suggest that it is the more severe fires that are needed to create conditions most suitable for this fire specialist: (1) not only is the black-backed woodpecker restricted to burned forests, but its distribution within burned forests is also relatively restricted to the more severely burned conditions (Kotliar et al. 2002, Smucker et al. 2005, Russell et al. 2007, Hutto 2008); (2) black-backed woodpecker nest sites occur in locations that harbor significantly larger and more numerous trees than occur around randomly selected sites within a burn (Saab and Dudley 1998, Kotliar et al. 2002, Russell et al. 2007). **Such nesting locations would be difficult to find in forests maintained as low-density, open, park-like stands due to frequent, low-severity fire."**

"How could a species evolve to depend on a condition that occurs only infrequently? The answer lies with the distribution and abundance of such fires across space and time. **The return interval for severe fire in one location may be several hundred years, but black-backed woodpecker populations persist in a particular re for >6 yr (Saab et al. 2007), so the probability of a severe fire occurring somewhere within an entire watershed in any given 6-year window is very high.** Thus, when viewed on a landscape scale, it becomes easy to imagine that a sufficiently mobile plant or animal species (e.g., re morel [Morchella angusticeps]; jewel beetle, Buprestidae; black-backed woodpecker) could become specialized to use a burned forest condition that is ephemeral on a local scale but always present somewhere in the larger landscape."

Efficacy

The short-term and temporary nature of the perceived fuels reduction benefits from most project are not likely to result in meaningful changes to fire intensity, size, or severity. Most projects designed to reduce fuels note that perceived benefits are estimated to affect fire behavior for approximately 20 years. If the estimated effectiveness is only approximately 20 years, then the justification for this project is even more tenuous. For example, Rhodes and Baker (2008) found that:

"[u]sing extensive fire records for western US Forest Service lands, we estimate fuel treatments have a mean probability of 2.0-7.9% of encountering moderate-or high-severity fire during an assumed 20-year period of reduced fuels."

Current forest management is unnecessarily putting firefighters at risk by focusing on remote areas, contrary to peer-reviewed science or common sense. Gibbons et al. (2010) found that defensible space work within 40 meters [about 131 feet] of individual homes effectively protects homes from wildland fire, even intense fire. The authors concluded that the current management practice of thinning broad zones in wildland areas hundreds, or thousands, of meters away from homes is ineffective and diverts resources away from actual home protection, which must be focused immediately adjacent to individual structures in order to protect them. In addition, other

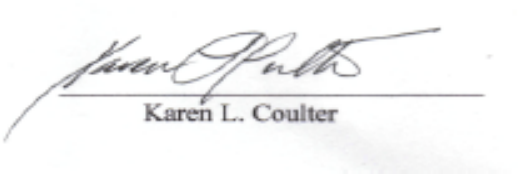
studies note that the vast majority of homes burned in wildland fires are burned by slow-moving, low intensity fire, and defensible space within 100-200 feet of individual homes [reducing brush and small trees, and limbing up larger trees, while also reducing the combustibility of the home itself] effectively protects homes from fires, even when they are more intense (Cohen 2000, Cohen and Stratton 2008).

Hutto et al. 2016 note, in relation to climate change, that increased efforts towards fuels reduction would be an untenable emphasis:

"Any perceived problem with future changes in fire behavior cannot be solved by redoubling our effort to treat this particular climate change symptom by installing widespread fuel treatments that do nothing to stop the warming trend, and do little to reduce the extent or severity of weather-driven fires (Gedalof et al. 2005). Therefore, fuel management efforts to reduce undesirable effects of wildfires outside the xeric ponderosa pine forest types could be more strategically directed toward creating fire-safe communities….Fuel treatment efforts more distant from human communities may carry the negative ecological consequences we outlined earlier and do little to stop or mitigate the effects of fires that are increasingly weather driven (Rhodes and Baker 2008, Franklin et al. 2014, Moritz et al. 2014, Odion et al. 2014)."

Thank you for consideration of our comments. Please keep us informed of all development with this project. Please contact me via mail or voicemail at (541) 385-9167, as I have no regular internet access from mid-April until mid-November.

Sincerely,



and

Paula Hood, Co-Director
Blue Mountains Biodiversity Project
Eugene Office
1560 Chambers St.
Eugene, Oregon 97402
Phone: 510-715-6238 paula@bluemountainsbiodiversityproject.org