

Blue Mountains Biodiversity Project comments on the Baker City Watershed Fuels Management Project Draft Environmental Assessment and Specialist Reports

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Please review the SamData flash drive storage device included with the physical copies of BMBP's comments mailed via USPS Certified Mail on Monday April 8th, 2024 for copies of all scientific articles referenced in these comments.

We are strongly opposed to any management in the Back country and Old Growth Preservation Management Areas, which includes our opposition to the planned prescribed burning and "Defensible Fuel Profile Zones" in the Inventoried Roadless Areas and the planned commercial logging, biomass reduction, and prescribed burning in the Baker City Municipal Watershed.

These planned multiple prescribed burning blocks and DFPZs in the Inventoried Roadless Areas and logging and roading in the Baker City Municipal Watershed would be intensive artificial management of the last Management Areas other than Wilderness that have not been intensively managed and altered by the Forest Service. These Management Area designations were intended to protect back country wildlands and old growth forest from logging, roading, and other intrusive management.

The conversion of the Inventoried Roadless Areas into managed "Fuel Blocks" is unacceptable. With so many burn blocks planned across the entire two Inventoried Roadless Areas with multiple ignitions planned over several years, this looks intentionally designed to start at least one high severity wildfire.

Most of the Municipal Watershed and the IRAs are high elevation, high moisture-retaining mixed conifer that naturally burn infrequently at higher intensity. Prescribed burning was designed to mimic frequent, low intensity fire that is more natural to lower elevation dry forest types dominated by Ponderosa pine or co-dominant Ponderosa pine and Douglas fir. Wildlife and plant species associated with infrequent high severity wild fire, evolved with, and adapted to less frequent fire and high severity fire, with average fire return intervals as long as 100-250 years for high elevation moist and cold forest.

The Municipal Watershed has been wisely protected from logging and roading (except for the Marble Pass road dividing the Watershed in half and separating the two Inventoried Roadless Areas) since 1862 and was designated as the Baker City Municipal Watershed in 1912 to protect municipal water quality and an abundant water supply. Municipal Watersheds have a long history of protection against logging and road construction to protect the water supply and water quality across the region.

The Inventories Roadless Areas and the Municipal Watershed are far more valuable for unmanipulated, intact wildlife security habitat and headwaters fish habitat where ecological functions and processes still continue naturally. These large, protected forest areas also form a critical forest carbon sink for long-term forest and soil carbon sequestration and storage to reduce the extreme

effects of climate change that threaten the forests, biodiversity of wildlife and plants, ecological functions and processes, and a livable planet for humans.

Inventoried Roadless Area designations and protections were supported by hundreds of thousands of people across the country. The intent of the public was for IRAs to remain unmanaged except for non-motorized trails to offer primitive recreation opportunities. Inventoried Roadless Areas provide solace from an increasingly industrialized world, high quality wildlife habitat, and headwaters providing good fish habitat and high water quality, as well as a source of abundant water supply for local communities, towns, and cities.

Municipal Watershed protection from logging and roading is supported by the best available current science. Higher elevation moist mixed conifer and associated drainages naturally retain more moisture. Logging moist mixed conifer forest—especially when logged to very low basal areas, as planned—can actually increase fire risk, rather than reduce the intensity and spread of fire. This is due to logging opening up stands, drying out micro-climate conditions, increasing wind speeds through the stands, and removing the most fire-resistant size of trees—mature trees, and potentially large trees, under alternative 2.

Logging and roadbuilding in Riparian Habitat Conservation Areas (RHCAs) has been debunked by the science. The INFISH and PACFISH “no logging” buffers are based on sound science. Logging on steep slopes over creeks and streams would introduce excessive fine sediment into the stream system, choking out the fish and causing turbidity that can prevent fish from seeing their prey. Threatened-listed Bull trout and other Threatened or Sensitive fish species in the watershed are vulnerable to degraded habitat from logging within the RHCAs. Negative impacts from logging in the RHCAs, even if confined to the higher or outer perimeter of the RHCA buffers, would include: higher sediment in streams, less shading from tall trees on the adjacent slopes increasing water temperatures beyond tolerance for fish species, and loss of recruitment into the future of large down wood in streams to create cooler pools for refugia in the summer. Reduction of organic matter from forest litter and coarse down wood from biomass (“fuel”) reduction planned, in combination with commercial logging, non-commercial logging, and prescribed burning would dry out the existing high water retention of the riparian ecosystem within the drainages, harming both habitat for aquatic and riparian-associated wildlife and plant species, and the abundance of the water supply for local communities.

Wild lands, including the Baker City Municipal Watershed, evolved with wildfire, not with artificial “fuel” breaks and prescribed fire. Inevitably, a wildfire will eventually burn in the watershed, but it would likely be a mosaic of burned and unburned forest, with varying fire severity. Fish and other aquatic life evolved with wildfire, not with commercial logging and biomass removal in riparian areas.

There is an extremely low statistical chance of the biomass “fuel” breaks and prescribed fire having any effect on the next wildfire, which may not happen within the 10-15 years that this management could be effective at all.

This plan to burn and reduce biomass through so-called “Defensible Fuel Profile Zones” appears to be an attempt by the Forest Service to manage all of the National Forest by getting their foot in the door for regular maintenance management in the protected Municipal Watershed and both of the Inventoried Roadless Areas—although future maintenance of the “fuel” breaks is unlikely to be funded, so this management would be even more useless. Such biomass reduction in “fuel” breaks tends to regenerate in dense spindly thickets of seedlings and saplings that are highly flammable—especially in moist mixed conifer and cold forest (often mostly Lodgepole pine, which is stimulated to seed in response to fire.)

With so many ignitions planned in the two IRAs over multiple years, the Forest Service is likely to inadvertently start an extensive, high intensity fire through the Municipal Watershed and the IRAs. There is nothing conservative or ecologically beneficial about these plans. Starting a fire could then open the floodgates to post fire logging, roading, more biomass removal, and general management of the few back country wildlands still protected in the area.

As the EA admits, the “Baker City Watershed has been well protected since its origin in 1862....” “Well protected” means well protected from logging, roading, burning, and other management.

Reconstructing the road dividing the IRAs and bisecting the Municipal Watershed, with past logging conducted off the road and planned to be repeated in the middle of the Municipal Watershed, with logging on steep slopes over major creeks, was another apparent attempt to get the agency’s foot in the door for more management of the backcountry, including logging and roadbuilding. Fortunately there was strong opposition to re-constructing this road for the local public and apparently the reconstruction of the Marble Pass road was abandoned. The responses to scoping comments in Appendix D seem to be far more responsive to local people than to environmental protection organizations representing hundreds to thousands of members of the regional public. This timber sale “project” is on a National Forest, not a private land forest, so the Forest Service staff should take environmental protection concerns seriously for a wide range of ecosystem services and Forest values.

Logging and road construction or re-construction are well documented to cause myriad negative impacts to wildlife habitat, water quality, water abundance, existing and future old growth structure, riparian area integrity, and ecological functions and processes. Logging on steep slopes above creeks and streams within the RHCAs makes no sense for improving “conditions”, as the easily displaced ash soil would be channelized from the “outer” RHCA to the streams, impairing water quality with excessive fine sediment loading, choking out fish populations and other aquatic life.

There is a lot of critical information and analysis that is not being disclosed in the EA, such as there is no mention of all the commercial logging adjacent to private lands on the outskirts of Baker City that has been done already. These stands are still very open and could be non-commercially thinned or prescribed burned if needed. There is no need to commercially log them again, as planned. Likewise, the commercial logging sale units off the road dividing the IRAs are also already very open from past logging. Non-commercial thinning could be helpful in some cases, but all these sale units have high moisture retention ideal for a municipal watershed. Thus these are more productive, and naturally denser high elevation moist mixed conifer sites. So the regeneration after logging of the mature and old overstory is vigorous. Logging these areas again would dry out their micro-climate moisture retention. Logging could result in greater fire intensity due to removal of more mature (and potentially large/old) trees that are more fire resistant, increased wind speeds through the stands, and likely dense regeneration of more flammable seedlings and saplings.

The Forest Service does not “need to act” in the management ways proposed. Instead, the Forest Service needs to engage in a badly needed paradigm shift that would focus on lighter, less damaging management such as managing wildfires when possible, using non-commercial thinning and prescribed burning to deal with any wildfire suppression in dry forest types, and protecting and increasing mature and large tree carbon sequestration and carbon storage to reduce extreme climate change effects. This necessary paradigm shift would also include ecologically sound, science-based riparian restoration that moves riparian areas toward achieving riparian management objectives under the Eastside Screens, including increasing suitable riparian hardwood habitat for a greater abundance of beavers to naturally extend moist floodplains through beaver dams and formation of braided stream channels.

We strongly disagree that: “Silvicultural and fuels management techniques are designed to restore ecosystem resiliency through the combined actions of reducing fuel loads by establishing shaded fuel breaks”, though we are not opposed to “reintroducing controlled fire in the landscape” in dry forest types and trying not to suppress wildfires as much as possible—in the backcountry but not immediately adjacent to residential communities. We disagree that “Implementing these treatments [in their entirety, as planned] will improve the probability of controlling wildfire to provide for a continuation of high-quality drinking water for residents of Baker City that depend on healthy forests.” (EA p. 5) The concept of “healthy” forests is geared toward rationalizing unnatural forest management, such as commercial logging and intensive biomass reduction. Intact forests with intact, natural ecological processes and functions should be the goal. Defoliating insects and tree disease are

natural self-thinning mechanisms of the forest, as are wildfires, windthrow, and periodic droughts. The presence and processes of natural disturbances do not make a forest unhealthy.

Regarding the “Purpose and Need” for the Baker City timber sale “project”, the desirable conditions already exist within the analysis area. Beneficial existing conditions include high water retention, incremental recovery from past logging damage, intact forested slopes (except where previously logged) that are relatively stable, an abundant water supply, recreational values and use, some closed road recovery, and diverse and far ranging wildlife species, including likely Threatened Canada lynx, possible Threatened wolverine, Vulnerable-ranked marten, possible Sensitive Pacific fisher, and Management Indicator species Rocky Mountain elk and Pileated woodpecker, as well as MIS Primary Cavity Excavating woodpeckers, and many other species, such as Black bear, Bobcat, and cougar. Some fish and other aquatic species habitat has been degraded by past logging and road construction and use, but could be restored if the commercial logging in the RHCAs and on steep slopes is abandoned.

Extensive commercial logging, especially to low basal areas, combined with significant biomass reduction in “fuel” breaks, and road construction and closed road re-opening are the kinds of management that would create a bigger gap in the near future between the existing condition and a desirable condition based on provision of ecosystem services; retention of mature forest cover and old growth structure; intact riparian ecosystem processes and functions; retention of high quality natural wildlife habitat; fertile, productive soil and high water quality and abundance, based on current best available science.

Using multiple ignitions across the Inventoried Roadless Areas for prescribed burning over several years of increasingly unpredictable weather conditions could easily ignite a major fire in the Baker City Municipal Watershed and cause a fire that could spread to adjacent private lands.

Logging and road construction, especially on steep slopes and within RHCAs, could increase water supply disruptions and cost increases to Baker City residents.

Non-commercial thinning up to about 9” dbh and prescribed burning in dry forest types could be enough “to create conditions that would allow for firefighters to be safe and successful (as much as possible) in protecting the watershed.

The EA does not disclose that there is considerable scientific controversy over the use of Historic Range of Variability to justify timber sales, since extreme global warming gives cause for re-thinking how to protect forests from extreme climate change effects while reducing the effects of climate change—e.g. by protecting mature and old growth forest cover from logging and allowing mature forest to grow into more abundant large trees to maximize carbon sequestration and carbon storage to help offset climate change effects. Scientists from the Pacific Northwest Research Center have expressed that being guided in silviculture to represent a historic point or range of conditions from the past is no longer applicable under a rapidly changing climate.

Commodity outputs from logging public lands are diminishing because of about a century of over-logging. Current timber sales are completely unsustainable—ecologically, economically, and culturally. Current timber sales now result in barren wasteland clearcuts, virtual clearcuts, and other logging to very low basal area retention—forest liquidation on a landscape scale. The accelerated scale and pace of logging devastation is now on unsustainable timber sale rotations of 30 years or less. The average diameter of remaining trees is often now only about 10-12” dbh, a smaller tree size than the timber industry usually uses to indicate tree maturity—at least at 16” dbh before logging. Local residents around John Day and Burns have been shocked by recent timber sale heavy logging transforming places where they have gone to recreate in the Malheur National Forest, from having lost a sense of place. It’s time to give back to the forest ecosystems through ecologically sound restoration and preservation of mature and old growth forest for wildlife habitat, carbon sequestration and storage, recreational values, and indigenous people’s cultural uses.

Re: the Proposed Action:

Based on our field surveying of the proposed commercial logging sale units, there is no “need” to improve forest health and resiliency to disturbance” by logging, as there are no evident significant “forest health” problems, except for small tree density in the lower elevation, drier forest types that have already been logged. Instead, there is existing variability with a diversity of tree species, including moist mixed conifer with high moisture retention (including in the higher elevation RHCAs) and remaining mature and large/old growth trees that are more resistant to fire. Leaving the watershed alone except for non-commercial thinning up to 9” dbh—in already logged areas—and prescribed burning only in dry forest types, would be enough “to improve forest health and resiliency to disturbance, reduce the risk of wildfire, increase structural complexity and species diversity of forest vegetation providing habitat to a wider range of wildlife species and economic benefit to the local economy.” (EA p. 6, first par.)

Commercial logging and road construction would be detrimental to “Forest structure, species composition and density levels” and commercial logging in particular is actually counterproductive for reducing the risk of high severity fire, as discussed in our above comments. Based on our field surveying of the commercial sale units, the only excessive density is small young trees only up to about 9” dbh at most. Small tree density only looks excessive in previously logged forest due to removal of mature and large overstory stimulation of dense regeneration or in higher elevation wildfire burned areas with vigorous seedling and sapling growth, often with riparian hardwoods in moister forest types that are naturally more productive.

The Eastside Screens amendment does not mandate the retention of old and large trees as a voluntary guideline instead of a legal standard, with “recruitment” allowing for a cumulative huge loss of large and old trees region-wide, despite the huge deficit in large and old tree habitat and an associated deficit in carbon sequestration and carbon storage to mitigate climate change effects. Yet the need to retain all large and old trees is more critical than ever, since large trees sequester and store the most carbon, are more resistant to fire, and provide critical habitat for declining wildlife species associated with large and old tree structure. Most conifer species in eastern Oregon, including Grand fir, develop thicker bark—especially at the base—and higher live crowns for greater fire resistance as large trees.

Old growth trees would inevitably be removed as large trees are logged, since most trees over ≥ 21 ” dbh are old growth trees, including large Grand fir, Douglas fir, Western larch, and Englemann spruce, not just Ponderosa pine. The Deschutes National Forest Bend-Fort Rock District staff did core sampling on Grand fir in the planned Ursus timber sale to determine at what size Grand fir were generally ≥ 150 years old, and determined to be old growth. They found that statistically, Grand fir were at least 150 years old on average at 22” dbh, not much different from the 21” dbh limit. Old growth trees are critical for preserving genetic diversity and retaining adaptations to evolving conditions over a century or multiple centuries. The EA fails to disclose and analyze the benefits of retaining large trees and old trees, as well as mature forest cover. Mature forest cover needs to be allowed to grow into large and old growth trees to reverse the deficit in large and old growth structure compared to historical conditions, both to reduce climate change effects and to preserve as much biodiversity of wildlife and plant species as possible during the Sixth Mass Extinction, which is human caused.

What are the different numbers of large trees per acre for different tree species to establish old forest structure? What is the scientific basis for different numbers of large trees by species?

Existing Late and Old Structure forest (LOS) needs to be fully protected from logging and mature forest needs to be allowed to grow into LOS. We are strongly opposed to further degrading LOS structure by removing large and old trees through logging. Most LOS has already been diminished by past logging. There was higher abundance of large and old trees historically, but this is not taken into account by Forest Service silviculturists as part of the historic range of variability in practice.

Re: p. 7 of the EA:

Logging out some of the large trees in the last higher quality old growth groves is directly harming wildlife associated with large and old trees. When this there is commercial logging, sometimes including large trees, in RHCAs, there is direct harm to habitat for fish and other aquatic and riparian species and to water quality due to loss of large wood recruitment in the streams, destabilization of steep slopes above the streams, and loss of riparian biodiversity through loss of moisture retention from shading, excess fine sediment loading into streams, and loss of LOS habitat structure for large and old tree associated plant and wildlife species diversity.

The criteria proposed for removal of large trees are silvicultural dogma, not any “need” to remove large trees. Most of the overstory has already been thinned, with removal of large trees through either logging or past fire. There is really no significant excess density of large trees in the overstory overall and on a landscape scale. Large trees are more intrinsically fire resistant, so it makes no sense to remove them under the guise of fire risk reduction. Large trees are not the source of insect and disease “issues” and both are natural thinning mechanisms. “Unfavorable species composition relative to HRV” is a common excuse to log and favor retention of timber industry preferred tree species for the next round of logging. Species conversion from mixed conifer to mostly homogenous single or double species plantations or commercial thinning removing tree species diversity makes stands more vulnerable to tree species-specific insects and disease. Removing large trees is the worst possible approach to conversions of tree species composition based on an assumed HRV, since large tree structure is rare compared to historic conditions. Further, most large trees are old growth trees that represent the tree species that historically existed on the site. There aren’t too many large trees in general, regardless of the species.

At the high elevations of the Municipal Watershed and along riparian drainages, on ashy soils, and on north aspect slopes, Ponderosa pine and Douglas fir were not the norm historically for the dominant overstory, based on remaining old growth Grand fir and Englemann spruce—live, snags, logs and stumps in these sites, based on our field surveying. The Forest Service should not be favoring retention of Ponderosa pine and Douglas fir where these were not the historically dominant overstory. Western larch can be found in moister sites, especially after fire, but are early successional species with naturally dwindling larch regeneration over time due to reduction of bare mineral soil regeneration habitat and shading from Grand fir, and Englemann spruce. This does not mean that there aren’t enough larch remaining to reseed sites with larch after fire. The Forest Service should not be trying to keep tree species composition in a static condition of all or most “early seral” tree species in moist mixed conifer, “dry Grand fir”, and cold forest sites.

Favoring retention of only or predominantly “early seral” tree species is not natural for all the moist mixed conifer areas, higher elevations, mid- to high elevation north aspect slopes, and riparian drainages. Within the higher elevation Municipal Watershed riparian areas, the mixed conifer was mostly Grand fir dominant or Grand fir/Englemann spruce dominant in the overstory, based on our field surveying.

The Blue Mountains National Forest plans, including the Wallowa-Whitman plan, are very outdated and rely on outdated science, such as Powell 1999. The Forest Service is ignoring the current best available science opposing heavy logging of mature, large, and old trees based on tree farm type silviculture. Suppressed tree and density-related tree mortality are natural self-thinning of the forest which provides recruitment of snags and logs for wildlife and to create habitat niches. Wildfire is also a natural disturbance which serves these functions, including infrequent, high severity fire.

Logging is documented in the science as spreading mistletoe, not reducing stand infestations. I’ve observed this in the aftermath of past logging for both Douglas fir and Ponderosa pine.

Old growth and large juniper (e.g. ≥ 18 ” dbh) should be retained where it exists, which is usually in dry forest types.

The Van Pelt guideline authors acknowledged that the visual characteristics would not be as accurate for determining the age of fir species. Using visual characteristics to determine which large trees are old growth would allow for widespread logging of old growth firs and possibly also spruce.

Inevitably the removal of Grand fir and Douglas fir would result in the loss of old growth Grand fir and Douglas fir. This would not be in keeping with using Historic Range of Variability as a guideline for silvicultural management. See our comments above regarding Grand fir cored on the Deschutes National Forest resulting in evidence that most Grand fir are old growth at 22" dbh in the Ursus sale area.

Re: p. 8 of the EA:

Most of the Baker City Municipal Watershed is at high elevation with moist mixed conifer that would be naturally subject to infrequent wildfire of high intensity due to higher levels of precipitation, longer retention of deeper snow pack and ash soils that have high moisture retention. Thus the Municipal Watershed could be within its natural fire return frequency, which could be as long as 100-250 years.

How was it determined that "lack of wildfire" is definitely considered "due to past suppression policies"?

Management (mostly logging, roading, and livestock grazing) has changed the forest from historic conditions, not "lack of management."

We oppose converting Old Forest Multi Strata (OFMS) to Old Forest Single Stratum (OFSS) stands in order to allow for logging in old growth habitat and removing existing and future large trees and old growth structure, degrading the old forest habitat for wildlife. OFMS is already within the assumed HRV for OFMS. Even by HRV logic, OFMS is not in exceedance of its historic abundance, so it should not be allowed to be converted to OFSS under the Eastside Screens. Conversion of OFMS to OFSS does cause loss of existing and future large trees and old growth structure, contrary to the EA assertion that "there would be no net loss of Old Forest structure." Cumulatively, LOS structure is lost with commercial logging in LOS, from the removal of large snags and large live trees deemed to be "hazard" trees, any intentional large tree logging, and loss of mature trees that could otherwise grow into large old trees needed to retain and increase LOS structure into the future. Large logs and snags may also be removed through later prescribed burning for "fuel" reduction, systematically degrading and diminishing LOS structure with each timber sale.

We are strongly opposed to any commercial logging within OFMS and OFSS. Old forest in general is at a deficit overall in this sale due to past logging and past wildfires.

Commercial logging (aka "treatments") do not "increase resiliency within these stands to insects and disease as well as wildfire" as claimed. Instead, logging reduces the most fire resistant mature and large trees. Mycorrhizal connections between trees are critical for transfers of nutrients and carbon from one tree to another and for communication in the groves alerting other trees to insect epidemics so that trees can use chemical resistance in response. (See Suzanne Simard's peer reviewed controlled science experiments.) Further, commercial logging favoring timber industry preferred tree species, reducing tree species diversity, that would otherwise break up tree species-specific insects and disease outbreaks. Logging also dries out stands, increases wind speeds through the stands, and leaves highly flammable slash, all of which decreases forest resiliency by increasing fire intensity and spread. Heavy logging to very low basal area retention, as planned, especially has these resiliency reducing effects.

Forests are capable of self-thinning and do not need to rely on human management for density reduction. Human management and manipulation of forests, including ongoing wildfire suppression, is the most likely source of what is considered "elevated stocking", ground and ladder "fuels", and tree mortality (although forest density and mortality exist in natural cycles.) Non-commercial thinning up to only 7-9" dbh and prescribed burning—only in dry forest types (Ponderosa pine or Ponderosa pine/Douglas fir dominance) should be sufficient within MA-15 stands to "reduce fuel loads, protect

surrounding private lands and make stands more resilient to stand replacement wildfire.” This is true for the entire Baker City Watershed “Fuels Management Project.”

Re: EA p. 8-9:

We are strongly opposed to using Whitebark pine restoration as an excuse to do more commercial logging. Commercial logging could negatively affect existing Whitebark pine—through soil impacts, drying out of the sites, causing more wind throw, cutting roots, etc. Instead use only non-commercial thinning up to 7-9” dbh, Verbenone use, pruning of adjacent conifer branches, and planting of rust resistant Whitebark pine seedlings. Drop the 81 acres of commercial logging in Whitebark pine habitat. Notably, Whitebark pine naturally grow in higher elevation, usually cold forest types that may have variable density in forest cover due to thin, rocky soils. Commercial logging would create drier, more open conditions and likely cause detrimental soil impacts due to the marginal soils. Whitebark pine did not evolve with or develop adaptations to commercial logging-created conditions.

Commercial logging is not restorative and does not “improve resiliency” for moist or cold Potential Vegetation Group (PVG) forest. The Forest Service automatically assumes that logging moves those forest types toward an assumed HRV based on lower elevation, drier, more open forest types. This is an intrinsic bias by the Forest Service, based on outdated silvicultural science and an outdated Forest Plan. We are strongly opposed to commercial logging of moist mixed conifer since moisture retentive forest is more critical to preserve than ever due to extreme climate change-driven warmer temperatures and prolonged droughts. Many wildlife species will need to migrate or disperse to cooler, moister forest as their lower elevation forest will become too hot and dry for suitable habitat. In general, wildlife species will be changing their range (when possible) to higher elevations and/or to the north. Water sources will be likely to dry out more quickly, which is already evident—especially in lower elevation, dry forest types. Further, logging would reduce moisture retention and potentially increase fire intensity in both moist and cold forest types. There is no ecologically credible need to create “regeneration sites” (i.e. clearcuts) of “various size openings”. We strongly oppose artificial conversion of mixed conifer to “early seral” tree species in forest PVGs that are naturally denser moist mixed conifer or cold mixed conifer forest not naturally dominated by Ponderosa pine. There is no need to “increase the amount of single story structural stages” or openings. Climate change risks substantial loss of forest cover through heat waves, prolonged droughts, and more intense wildfire. Most logging management of moist and cold forest types causes unnatural impacts.

The Forest Service is not disclosing or analyzing the negative effects of proposed commercial logging and road re-opening and construction and is also not disclosing or considering that climate change will inevitably reduce forest cover that implies the need to reduce global warming by reducing CO2 emissions and protecting and increasing mature forest cover as a carbon sink. The EA is also not disclosing and considering that commercial logging is the biggest source of CO2 emissions in Oregon and that logging is increasing climate change impacts.

The Forest Service needs to abandon the use of outdated basal area spacing and defining “desirable” and “best” trees largely based on timber industry preferences. Notably, the Forest Service does not clearly disclose in the EA the resulting barren wasteland conditions from lower management zone basal area logging, which resemble virtual clearcuts with few live trees.

Under “Snags and down logs”, the Forest Service states that “over time [undefined], new snags would occur throughout the landscape by inter-tree competition, weather, fire, insects and diseases”, which is what we call forest self-thinning. Yet under “Salvage Component in Harvest Prescriptions”, it sounds like snags would be removed. There is no evident analysis that would ensure meeting Forest Plan snag requirements for snag size and abundance. New snags will take decades to develop.

Grand fir is an important species for wildlife habitat for large internal denning cavities for Pacific fishers and for regular production of abundant snags and logs used by many wildlife species and for drought resilience under climate change. Grand fir have the capability to re-grow their needles after one wet winter after complete defoliation due to drought or a spruce budworm epidemic. Grand fir can

do this by storing water in their roots. Cavities at the base of trunks of mature and large Grand firs collect snowmelt water in pools under the tree that small mammals, reptiles, and amphibians can use for drinking during droughts, since the water reserve often lasts for most or all of the summer.

Wildlife connectivity corridors should not be logged, with reasons given in our comments above.

Re: “Upland Treatment Prescriptions”:

Logging large trees contradicts the goals of reducing fire severity, enhancing “forest health”, retaining the largest, healthiest trees within the stand, and emphasizing “retaining trees from the older age classes.”

We strongly oppose proposed conditions whereby “most stands receiving the HTH [commercial thinning] prescription would be managed to at or near the LMZ [Lower Management Zone with the least tree retention] in order to [theoretically] maximize treatment effectiveness.” (EA p. 9)

Re: EA p. 10:

Having field surveyed most of the Baker City commercial sale units and looked at some of the non-commercial thin units, we agree that non-commercial thinning would be useful as a stand alone management in the NCT designated areas and should be used instead of commercial logging in the planned dry forest commercial logging sale units. The vast majority of any “excess” tree density is only up to about 9” dbh at most. The Forest Service acknowledges the usefulness of stand alone non-commercial management as follows: “NCT is a stand tending treatment designed to improve diameter growth rates by reducing the density of non-commercial size trees, improving species composition and reducing risk of high fire severity as well as susceptibility to insects and disease.” (EA p. 10, 1st par.) Thus non-commercial thinning as a stand alone management tool meets the stated purpose and need for the Baker City Watershed Fuels Management Project.

Never logged forest should not be logged in order to preserve: natural ecosystem processes and functioning, wildlife security habitat of high quality, water quality and abundance, forest carbon sequestration and storage, reference conditions for scientific study and to inform adaptive management, and opportunities for primitive recreation and spiritual solace. Previously logged sale units are mostly wide open from past commercial logging of mature and large trees, with variable density already.

The Forest Service needs to abandon the “desired retention species” goal, as the end result is usually far less tree species diversity where it would naturally exist, and increased fire risk and insect and disease infestation due to more homogenous stands.

We are not opposed to some “ladder fuel” reduction under large and old trees within the single dripline up to 10” dbh.

We are opposed to commercial logging of conifers in aspen stands > 14” dbh, as mature and large tree forest cover retention is critical. Most competition of conifers with aspen is only small trees up to about 9-10” dbh. Aspen groves have three times as much biodiversity when large conifers are retained. Large Ponderosa pines and Western larch have been determined by Malheur Forest Service staff to not significantly shade out aspen due to very high crowns.

We can support conifer release up to 14” dbh being limited to the footprint of where the aspen are growing or sprouting plus one and one half tree heights if these are based on adjacent tree sizes. Soil sampling is more accurate and is used on the Deschutes National Forest to determine the historic extent of the aspen groves, based on dark loamy soil from long-term deciduous leaf inputs. The Malheur Forest staff also consider the aspect relevant to the aspen stand, since sunlight is the limiting factor. So west and south aspects have wider boundaries for conifer felling and the north and east aspects have only narrow boundaries for conifer felling.

Re: “Riparian Vegetation Restoration Treatments:”

We are strongly opposed to reducing “conifer stocking levels within the overstory and shift species composition to an earlier seral state.” This rationale is just an excuse for commercial logging in RHCAs. Commercial logging in riparian areas is counterproductive for meeting riparian management

objectives under the Eastside Screens. Negative impacts for logging within RHCAs include loss of shading to streams for cooler water and moisture retention, loss of long-term recruitment of large down wood to streams to form cooling pools that trap sediment and provide refuge for fish, loss of stabilization of slopes from logged trees in the outer area of the RHCAs to prevent landslides and reduce excess sediment channeling into streams, and direct sedimentation of streams from commercial logging in the RHCAs.

We are strongly opposed to any commercial logging and mature and large tree felling within RHCA INFISH/PACFISH buffers. Any aquatic restoration for the area should be done separately from this timber sale planning and should be planned by fish biologists and hydrologists, not silviculturists. Non-commercial thinning of small trees up to 9" dbh and allowing prescribed fire to back into the RHCAs should be sufficient to release riparian hardwoods where needed. Prescribed fire should be restricted to the dry forest types, not the naturally more productive moist mixed conifer RHCAs in the Baker City Municipal Watershed and in higher elevations with moist mixed conifer within the RHCAs.

Threatened Bull trout and any other historically present or resident fish species, such as Sensitive Redband trout and Threatened Mid-Columbia Steelhead trout, need cold water from forest shading, including from trees on the upper RHCA slopes, and prevention of excessive fine sediment from logging. Biomass reduction should also not take place within the RHCAs, as forest litter and coarse woody debris are needed for organic nutrients and moisture retention in riparian area soils. Shrubs need to be left for riparian-associated song birds and aquatic macro-invertebrates. Logging is not restoration.

Based on our field surveying, most of the creeks and stream drainages in the Municipal Watershed were not historically early seral tree species except for Western larch after fire. Instead, old growth Grand fir and Englemann spruce are the dominant overstory with more Englemann spruce right next to the creeks and more Grand fir on the slopes above the creeks and streams, with some old growth Western larch, as evidence of historic presence, along with old growth snags, logs, and stumps of these species.

Re: p. 11:

Based on our field surveying across the timber sale project area, non-commercial thinning and letting prescribed burning back into the RHCAs in the lower elevation dry forest types outside the Municipal Watershed boundary could be beneficial where small tree density could be precluding riparian hardwood establishment, but there is no need to do commercial logging to improve riparian hardwood abundance. The commercial sale units in the dry forest types at lower elevations have already been commercially thinned, including within the RHCAs. There is no surplus of mature and large conifers in those RHCAs. In the higher elevation Municipal Watershed RHCAs, the forest close to the streams tends to transition in tree species composition to more old growth Douglas fir, Grand fir, and Western larch in the driest RHCAs and in the moister mixed conifer RHCAs, there is historic dominance of Grand fir and Englemann spruce in the RHCAs. The plan "to reduce conifer stocking levels within the overstory and shift species composition to an earlier seral state" would be unnatural and counterproductive for: retaining moisture within the entire RHCA, shading the creeks and streams for cooler water temperature, long-term recruitment of large wood into streams to form pools and providing slope stability above the streams to prevent heavy sediment flows from entering the streams.

Drop all commercial logging in RHCAs. Prescribed fire and non-commercial thinning of small trees is not even needed in most of the commercial logging sale units in the RHCAs in the Municipal Watershed. In the moist mixed conifer RHCAs prescribed burning is not needed and would be an artificial manipulation.

Where RHCA commercial logging has been done previously, there may be a need to plant locally sourced native hardwoods in existing gaps, as some of the logged RHCAs in the lower elevations had skid trails crossing the streams and have barren ground adjacent to the streams. These RHCAs were historically likely to have some combination of willow species, Rocky Mountain maple, alders, and

Red Osier dogwood, as well as Cottonwood trees and aspen along major creeks with wider floodplains. Non-commercial thinning, where really needed, would be enough to create openings for riparian hardwoods where they were historically likely to exist. Commercial logging in RHCAs has not restored riparian hardwoods by creating openings, instead creating conditions for dense conifer seedling establishment. Cattle would have to be effectively excluded from riparian hardwood restoration sites. We support non-commercial thinning of young conifers less than 10" dbh within riparian areas where there are really dense conifer seedlings and saplings outcompeting riparian hardwoods where they currently exist or historically existed.

Re: "Defensible Fuel Profile Zone" (DFPZ):

We are strongly opposed to "Defensible Fuel Profile Zones" in the Inventoried Roadless Areas and the Baker City Municipal Watershed, as these are protected back country areas dedicated to wildlife security habitat, preservation of reference condition forest with intact ecological processes and functions, and for primitive recreation and finding solace from increasingly human-dominated and manipulated environments. DFPZs are unlikely to be effective in reducing fire intensity or spread when a fire actually occurs in that location as their possible effectiveness only lasts for about 10-15 years. DFPZs are unlikely to be maintained into the future, as there may be no funding for such repeated maintenance.

Further, extreme global warming effects of prolonged drought, unprecedented heat waves, and high wind speeds make climate change-driven fires virtually impossible to stop. Keep in mind that climate change-driven fires have jumped the Columbia River and the McKenzie River.

300 foot DFPZs and 25 foot spacing of trees is excessive. We do appreciate that DFPZs planning is avoiding commercial logging and focusing instead on a combination of non-commercial small tree thinning and prescribed burning. However 50 foot wide DFPZs along roads are more reasonable and should only be implemented along major access roads and near residential communities. Once DFPZs are as wide as 100 to 300 feet, there can be overlap with little natural looking forest in between, especially along curving roads that have hairpin turns or other tight curves, as with the Marble Pass road.

Drop prescribed burning in moist mixed conifer forest since this forest type would not have been a frequent, low severity fire regime. Prescribed fire was not designed to mimic the effects of infrequent high intensity fire regimes typical in higher elevations and moist or cold mixed conifer forest types.

Re: EA p. 12:

Restrict any prescribed burning to the warm and hot dry forest sites within the project area. How often is "follow up maintenance burning" actually implemented after the timber sale-associated burning? The Malheur National Forest often has a back log of planned prescribed burning that was not implemented due to weather conditions, community objections, or lack of funding. So it makes sense to restrict prescribed burning to areas with characteristic frequent low intensity fire and areas that are nearest to residential communities for fire risk reduction. Fire "risk" is a socio-economic issue, not an ecological fire risk.

We are opposed to prescribed burning during the spring reproductive season, starting around mid-April. This is to prevent drying out soils right before the summer dry season and to protect nesting birds and fledglings, young mammals and reptiles in burrows, and Sensitive plant reproduction. The Heppner Ranger District of the Umatilla National Forest successfully implements prescribed burns in the spring while there is still snow on the ground, prior to the spring reproductive season.

Re: EA p. 13:

13,808 acres of prescribed fire is excessive and unnecessary. Focus prescribed fire on lower elevation dry forest types and drop planned burning in moist mixed conifer and cold forest that evolved with infrequent high intensity fire.

"Through a cooperative agreement (dating back to 1912) between Baker City and the U.S. Department of Agriculture, the Marble Point and Twin Mountain IRAs have been managed to protect

the City's municipal water supply." Logging does not protect the Municipal water supply. Instead it threatens the water supply and water quality.

Drop all prescribed burning in the two Inventoried Roadless Areas—the 8,669 acres of prescribed burning in the IRAs. The Inventoried Roadless Areas are last areas which are not manipulated by human management. Forest areas that have never been logged or roaded are now rare outside of Wilderness Areas and need to be left in an un-managed natural state for reference conditions for scientific research, protection of natural ecosystem functions and processes, retention of high quality back country wildlife security habitat, and primitive recreation values and indigenous people's cultural uses and treaty rights. Inventoried Roadless Areas also protect high quality headwaters conditions for downstream fish and other aquatic and riparian-associated wildlife and plant species, as well as to protect sources of abundant clean drinking water. Inventoried Roadless Areas also provide high elevation habitat for migrating or dispersing wildlife species seeking refuge from no longer suitable lower elevation habitat due to climate change.

The many planned ignitions for prescribed burning in the two IRAs make us very concerned that the Forest Service could inadvertently start one or more fires in the IRAs and the Municipal Watershed. Many ignitions for many burn blocks are planned across the entire IRAs over a 7-10 year timeframe, increased likelihood of accidentally starting a major fire in the Municipal Watershed area. The EA specifies that "prescribed "burning ignition would generally only occur on slope aspects where fire starts are most likely to ignite and spread. Generally, this is the more southern slopes." These prescribed burning locations would also increase the chances of starting fires in the Baker City Municipal Watershed and the IRAs. Of course increasing the chances of fires being ignited in the IRAs and the Municipal Watershed is completely contrary to the stated purpose and need of the Baker City Watershed Fuels Management Project, with the emphasis on reducing fire risk.

It's not as if the Forest Service has never started a fire through prescribed burning. Such a fire was started on the Malheur National Forest recently, burning private land and causing legal action against the Forest Service.

Re: EA p. 17 and an Inadequate Range of Alternatives:

This is an inadequate range of alternatives, as the two alternatives are planned to have identical management except for the logging of large trees ≥ 21 " dbh. This inadequate range of alternatives is based on ignoring all our other major concerns expressed in our comments and in those of other environmental protection organizations. These major concerns include proposed commercial logging in the Riparian Habitat Conservation Areas, commercial logging on steep slopes, commercial logging in never logged and unroaded forest, and new "temporary" road construction and re-opening of closed roads, as well as extensive prescribed burning and planned "Defensible Fuel Profile Zone" biomass reduction across both Inventoried Roadless Areas. The Forest Service also failed to consider our concerns regarding the need to avoid CO₂ emissions from logging and other heavy equipment use and the need to optimize forest carbon sequestration and carbon storage to reduce extreme climate change effects. See the Greater Hells Canyon Council's similar comments to ours and Oregon Wild's similar comments to ours. These include GHCC comment #87 on EA p. 28, specifically requesting an action alternative that "emphasizes the carbon sequestration potential of the forests" and asks that there only be hand-thinning and controlled burning in RHCAs and to not use mechanized equipment or logging on steep slopes in RHCAs. (GHCC comment #83) Our organizations were in strong agreement and collectively represent the support of thousands of people.

There are no credible reasons or detailed analysis provided to support the claim that additional alternatives to the proposed action that were proposed by commenters "were not developed because they did not meet the purpose and need for the project." (EA p. 17) This indicates that the purpose and need for the project was too narrowly construed in order to avoid incorporating a full range of alternatives in response to public comments.

From our point of view, the proposed management actions with which we disagree are not consistent with the stated purpose and need for the project. The alternatives proposed by the public that the Forest Service rejected included: no logging in RHCAs, no “temporary” road construction, and no logging in moist forest. None of these proposed management action alternatives being adopted would have wholly scrapped the project, and these reasonable alternatives would have still allowed for the overall stated purpose and need for the project being met.

The purpose of NEPA Environmental Assessment or Environmental Impact Statement environmental effects analysis and public comments is for the Forest Service to seriously consider the full range of public scoping and comments to guarantee that there is a full range of action alternatives based on public concerns in the EA or EIS and for diverse public comments to shape the proposed action and the final decision. Yet the two action alternatives are identical in proposed management except for logging large trees under alternative 2 and not logging large trees under alternative 3. The acreage is the same for otherwise identical management actions. There is no choice offered to not allow commercial logging in the Municipal Watershed, the Riparian Habitat Conservation Areas, on steep slopes, or in moist forests that have higher water retention for the Municipal Watershed. There was also no action alternative choice offered that would avoid igniting fires for prescribed burning across the two Inventoried Roadless Area over several years, with multiple ignitions that could inadvertently start a major fire.

The need for an Environmental Impact Statement for the Baker City Watershed Fuels Management Project:

These public concerns reflect potential significant negative environmental effects from the proposed management actions at issue. Given that the Baker City Municipal Watershed has been mostly protected from logging and roading since its designation in 1912 and before that has been “well protected” since 1862, such intensive logging to very low basal areas within the Municipal Watershed and on steep slopes and within Riparian Habitat Conservation Areas and within moist forest is highly controversial based on the relevant science as well as public opinion. Such logging could contribute to significant negative effects to water quality and abundance within the Municipal Watershed. The potential of both proposed action alternatives to cause significant negative effects to water quality, water abundance for Baker City water uses, and to Threatened and Sensitive listed fish species give cause for NEPA requirements to use an Environmental Impact Statement, not just an Environmental Assessment. The EA is also highly deficient in that virtually all of the detailed environmental effects analysis was outsourced to Specialist Reports that were not even summarized in the EA. We request the preparation and release of a full Environmental Impact Statement for this project with the requisite in-depth, detailed environmental effects analysis and 45 day comment period and a full 45 day objection period after the Draft Decision.

Multiple ignitions to implement prescribed burning across both Inventoried Roadless Areas, theoretically to “reduce fire risk” and the imposition of ridgeline “fuel” breaks up to 300 feet wide within the IRAs pose significant negative impacts to the Inventoried Roadless Areas’ natural wild character. The planned prescribed burning in the IRAs could potentially cause the inadvertent ignition of a major fire in the Inventoried Roadless Areas that could burn with high intensity and far reaching spread toward private lands, given the increasingly extreme heat waves and prolonged drought under climate change and the increasingly unpredictable weather shifts. So such prescribed burning in the IRAs would also be scientifically controversial, as well as of great public concern. Proposed management actions that could foreseeably start a major fire in the Inventoried Roadless Areas and the Baker City Municipal Watershed would be contrary to the stated purpose and need stated for the project and could cause widespread significant negative effects. These concerns also warrant requiring an Environmental Impact Statement for this project.

After considering the significance of the potential negative effects from the proposed management actions under both action alternatives, and the related need to prepare an Environmental Impact

Statement for this project, perhaps the Interdisciplinary Team could determine that these concerns expressed in the previous two paragraphs actually do “warrant a fully analyzed, separate alternative for this project” to provide a full range of alternatives.

Deficiencies of the Baker City Watershed Fuels Management Project Environmental Assessment:

There are not even any summaries of the in-depth analysis for any of the resource (life source) issues in the Environmental Assessment, with no inclusion of in-depth or detailed analysis of any potential negative effects of the proposed management actions in the EA. There is no detailed consideration in the EA of how negative effects would be mitigated except for listing or proposed mitigations through Project Design Criteria. There is also no evaluation in the EA of how effective Project Design Criteria would be, based on actual potential conditions, scientific study findings, or past history results with these PDCs from actual use on the ground and post-implementation assessment of effectiveness.

Virtually all required in-depth, detailed environmental effects analysis required by NEPA has been outsourced to specialist reports listed on EA p. 25 that are not incorporated in the EA, not summarized in the EA, and not included with the EA as appendices. Specialist reports at least have to be summarized in the EA or EIS, as otherwise the public has no way to judge the effects of proposed management actions to the many Forest values at stake. There is no indication of specialist concerns within the EA, although some of the separate specialist reports indicate deep concerns by Forest Service scientists regarding potential negative effects to values such as wildlife, long-term detrimental impacts to soils and landslide risk, and effects to fish species and water quality. Having to wait to receive the separate specialist reports makes it difficult or impossible to assess the relative effects of different management practices proposed to all the different Forest ecological values and human uses of the forest—before the deadline for comments.

For instance, I don’t have regular or easy access to the internet for the seven months of the year when I am living in eastern Oregon. As it was, two of the specialist reports sent to me by email didn’t come through successfully via the internet. I also requested all the specialist reports to be sent to be by mail, but they arrived very late in the comment period, leaving me far less time to read the detailed analysis and write and type comments.

The agency attitude in the EA seems to be “Just trust us; never mind the details.” The EA seemed to be a rubber stamping exercise designed to find all proposed management to cause no significant impacts or violations of law, yet with little to no supporting analysis. A rubber-stamping process is unjustifiable, given the long history of similar Forest Service management practices causing long-term and cumulative negative impacts, such as long-term detrimental soil damage and increasing declines in wildlife species populations, including fish species.

NEPA requirements for detailed, in-depth environmental effects analysis of cause and effect relationships and relevant science findings are meant to fully inform the public, so that they can make informed comments, not just have access to a one-sided agency view in the EA with few choices discussed or offered. The detailed, in-depth analysis of the issues at stake should be incorporated into the EA for easier public access, not held back in “the project file” so that the public has to request the specialist reports. Usually people planning to write comments expect the detailed environmental analysis to be incorporated within the EA, so by the time they realize that virtually all the analysis is effectively hidden away and must be requested, it may be too late to read all the additional information and write comments regarding the analysis in the specialist reports.

We are strongly opposed to the virtually complete elimination of detailed, in-depth analysis for any negative ecological effects of proposed management actions in the EA. Detailed consideration of potential environmental effects is meant to lead to adaptive management rather than repeating past management mistakes.

Comments on the Soil Report and the Landslide Mapping Report:

We are very concerned that the cumulative effects of planned intensive commercial logging to very low basal area retention combined with various forms of biomass reduction are likely to not

leave enough coarse woody debris to support soil nutrient cycling, water retention, carbon storage, and erosion control. We are concerned that there is a high likelihood of detrimental soil impacts from heavy equipment use on sensitive soils, easily displaced ash soils, steep slopes where logging is planned, and in Riparian Habitat Conservation Areas where logging is planned in particular. Cumulative negative impacts to soils are also likely due to potential multiple passes with ground-based equipment, such as logging-associated skidding, then potential mechanical non-commercial thinning, followed by potential mechanical grapple piling and burning.

Organic Matter:

The Soil Report largely supports our concerns that too much organic matter would be removed by heavy logging in combination with non-commercial thinning, grapple piling and burning, and subsequent prescribed burning: “Organic matter in its various forms is critical for long-term site productivity and ecosystem sustainability. Regional direction states it should be maintained in amounts sufficient to prevent short or long-term nutrient and carbon cycle deficits and to avoid detrimental physical and biological soil conditions. Organic matter is particularly important for water retention, cation exchange, nutrient cycling, and erosion control (Powers et al., 2005). Studies of vegetation management activities show that loss of organic matter can reduce soil productivity by changing soil physical, chemical, and biological properties (Perry et al., 1989; Powers et al. 1990; Dyck et al. 1994; Everett et al., 1994; Harvey et al., 1994; Henderson, 1995; Jurgensen et al., 1997).” (Soil Report, p. 4, 2nd par.)

All of these critical science citations and soil scientist analysis should have been incorporated in the Environmental Assessment. This is the case with the other Specialist Reports as well. There is no legitimate reason to exclude the detailed, in-depth environmental effects analysis and science citations from the Environmental Assessment, causing us to conclude that whoever wrote the EA did not want to disclose the Specialist Reports’ analysis and science citations in the EA for easier public access and consideration for comments.

Loss of organic matter from soils reduces water retention, nutrient cycling, and erosion control, all or which are critical to retaining watershed integrity, water quality, and water storage for an abundant water supply.

We are concerned that too much coarse wood debris would be lost as: “Coarse wood debris (CWD) are woody stems > 3” in diameter and is recognized as vital for soil productivity processes by moderating temperature and moisture, provides a foci for heightened soil biotic activity and serving as mulch that retains water, particularly when decayed wood incorporates into topsoil horizons and layers the surface soil (Harvey et al. 1987). The desired ranges in the proposed action provide tonnage, but larger material has greater value since these logs will decay into soil as soil wood.” (Soil Report, p. 4, 2nd to last par.) This analysis supports avoiding the logging of large trees, as in alternative 2, which are increasingly scarce and at a severe deficit compared to historical conditions due to about a century of logging large trees in eastern Oregon. Far more mature trees also need to be retained to grow into large wood structure for soil carbon storage, nutrient cycling, and water retention.

We are concerned that the Grand fir/Rocky Mountain maple, Grand fir/Queen’s Cup Bead lily, and Subalpine fir/Twinflower Plant Association Groups (PAGs) in the project area would not have the optimum retention of 12-25 tons of coarse wood debris (Graham et al., 1994; DeBano, Neary, and Folliott, 1998; Brown et al., 2003) after commercial logging, any road construction or road re-opening, non-commercial thinning with piling and burning, and potential subsequent prescribed burning. (See Soil Report, p. 4, Of these PAGs, 2nd par.) Of these PAGs, the Grand fir/Rocky Mt. maple and Grand fir/Queen’s Cup Bead lily PAGs are common in the high elevation commercial sale units in the Baker City Municipal Watershed off the Marble Pass road and secondary roads. These PAGs are especially found in the RHCAs in that area, including in the RHCAs where commercial logging is planned, based on our field surveying.

The Soil Report details the critical roles that coarse large wood plays in moisture retention and the inter-tree transfer of nutrients and water to support forest resiliency to disturbance: “The brown cubicle rot that becomes soil wood has particularly high value given its [ab]sorption of water. Coarse wood that forms microsites on the forest floor mediates droughty conditions. Mycorrhizae that [are] particularly rich near and around decaying wood essentially extend the rooting systems of trees. Conifers are obligate hosts where these trees rely on ectomycorrhiza as [a] conduit for nutrients and water. This conduit which travels through decayed soil wood and forest floor mulch also may transfer nutrients and carbon between mature [trees] and seedlings as well as across tree species (Simard et al. 2012).” (Soil Report, p. 4, last par.)

We appreciate the Forest Service soil scientist’s disclosure and consideration of Suzanne Simard’s ground-breaking peer reviewed science from controlled experiments regarding nutrient and carbon transfers between trees. These findings have been disregarded by the authors of Forest Service Environmental Assessments and Environmental Impact Statements even though Simard’s research has been available for decades, with the above specific research dating back to 2012.

It’s especially critical for a Municipal Watershed and headwater streams to retain cool abundant water for Threatened Bull trout and other Threatened and Sensitive fish species, as well as for amphibians and macroinvertebrate fish prey, as well as for riparian-associated plant and wildlife species, and abundant high quality water for local communities.

“Since forest soils on the WWF [Wallowa-Whitman National Forest] typically have minimal soil organic matter, much of the nutrient base resides as mulch in the forest leaf and needle litter, duff, downed material including CWD on the soil surface, and the rooting biomass below the surface (Jurgensen et al. 1997, Deluca et al. 2019). Over half of the forests carbon stocks on the Wallowa-Whitman NF are stored in litter material on the forest floor and soil carbon contained in organic material to a depth of one meter, excluding roots.” (Soil Report, p. 5, 1st par.)

Preserving forest leaves and needles, duff, and down material, including coarse wood debris thus is critical for long term carbon storage in soils to reduce extreme climate change. This indicates the compelling need to stop logging of mature and large trees, stop road building and re-opening and to otherwise reduce existing and future forest litter, such as by reducing pile burning and prescribed burning.

The Environmental Assessment does not include disclosure of all this critical soil science and related analysis from the Soil Report for ensuring that water retention, nutrient cycling, and soil carbon storage will be able to continue. For instance the following science explains why it is important to preserve natural levels of down wood and leaf and needle forest litter.

Soil Biological Activity:

“Soil organisms depend on organic matter for the nutrients they need to carry out their life processes. Decomposed large woody debris provides habitat for the survival of mycorrhizae fungi. These fungi form a symbiotic relationship with tree roots, increasing water and nutrient uptake by the trees and the fungi (Borchers and Perry, 1990).” The public needs to be aware of the ecological science, including cause and effect relationships, in order to submit informed comments.

2. Sensitive Soils:

“Thick ash cap soils are also considered a sensitive soil. Volcanic ash has a low bulk density and bearing strength, which enables a high water-holding capacity (Geist and Strickler, 1978; Geist et al., 1989). The low bulk density also increases the potential for rutting and compaction....Thick ash caps also have a udic soil moisture regime which holds onto moisture longer than other soil types that can increase degree, extent, and duration of disturbance from ground-based equipment (Craig and Howes, 2007).” (Soil Report p. 5) Ash soils are critical to preserve for their “high water-holding capacity” that “hold onto moisture longer than other soil types.” Water retention is critical for Municipal Watersheds and under extreme climate change high temperatures, with more prolonged heat waves and droughts. Most of the sale units in the Municipal Watershed and along RHCA with perennial

streams have ash soils that would be easily displaced and lost by steep slope logging currently proposed for these areas. Heavy equipment can also displace ash soils even when on flatter ground, as I observed in the Black Bear sale area in the Ochoco National Forest after logging.

Recently Forest Service soil scientists on the Umatilla National Forest have been identifying ash soils as irreplaceable, as its replacement would require the geologic time equivalent of Mount Mazama erupting about 6,000 years ago and forming Crater Lake. That one Mount Mazama eruption is responsible for depositing all the ash top soils across eastern Oregon National Forests.

Soil Erosion:

There are many good reasons why Municipal Watersheds—including Baker City's—have been fully protected from logging and roading and most other management. The soil report describes some of the differences between undisturbed forest soils and management impacts..

“Surface erosion is most serious on bare, non-vegetated soil surfaces where sheet and rill erosion are responsible for most soil loss. Erosion is infrequent on undisturbed forest soils for two reasons:

- Abundant organic matter provides a protective layer on the soil surface that reduces the impacts of raindrops and allows water to infiltrate; and
- The surface soil below the organic layer is by nature porous, allowing water to infiltrate into and through the soil profile (Goldman et al., 1986)

Vegetation binds soil particles together with roots and vegetative cover and protects the soil surface from raindrop impact and dissipates the energy of overland flow. Soil erosion can occur when the surface soil is compacted or when the loose surface and its protective layer of organic material are changed by management activities. Compaction, rutting, and puddling reduce the movement of water into the soil and tend to channel and concentrate water. Soil erosion can result in loss of soil productivity due to surface soils moving downslope and thus removing the materials with the greatest ability to hold moisture and nutrients.” (Soil Report, p. 6)

It is important to keep the watershed forest intact to prevent erosion and landslides. Soil erosion and landslides also increase fine sediment in stream systems, impairing water quality for aquatic species, other wildlife species, and for the human water supply. Without intact municipal watersheds and without water quality, local communities would have to spend millions of dollars for a water filtration plant.

In our experience field-surveying proposed timber sales over the last 33 years, the Region 6 Soil Quality standards are often not sufficient to prevent long-term detrimental soil impacts, which is especially the case where logging on steep slopes or within RHCAs took place. Sensitive shallow soils also tend to have long-term detrimental soil impacts—especially where roads not constructed to be system roads were continually used.

Slope Stability and Landslide Risk:

We are concerned that: “Management activities can saturate a soil by channeling water and concentrating it onto a limited area, for example, below a road culvert or a rutted skid trail. All mass failures triggered by human causes are classified as DSC [Detrimental Soil Conditions]. These disturbances cause long-term changes in soil productivity that can last centuries.”

“These areas are included in PACFISH/INFISH and Forest Plan definitions and need to be buffered as a Category 3 (seasonally flowing or intermittent streams, wetlands <1 acre, and landslide-prone areas) according to PACFISH/INFISH directive.” (Soil Report p. 6) Are all potential mass failure areas planned to be avoided as Category 3 RHCAs with no logging or roading buffers, as apparently required under the Eastside Screens PACFISH/INFISH requirements?

Landslide Mapping Report:

There were nine rockfall areas and 15 landslides mapped in the Baker City Watershed project area during the rapid assessment in the Landslide Mapping Report. “Treatments occurring in rockfall areas include inventoried roadless area burn blocks. Treatments in most mapped landslide areas include

burn blocks and non-commercial thinning. Two mapped landslide areas occur in commercial harvest, pre-commercial thinning, and prescribed burn areas.” The Landslide Mapping Report also notes that: “Landslides, rockfalls, and landslide susceptible areas occur naturally throughout the project area.” (Landslide Mapping Report, Table 3 and the paragraph above Table 3)

The Landslide Mapping Report warns: “Disclosure: “ This reconnaissance mapping of landslides in the Baker City Watershed Fuels Management Project area was a **rapid** assessment. Landslides...have **not** been field verified. Ages and causes of mapped landslides remain unknown at the time of this report. Additional landslides and landslide-prone areas not highlighted in these maps may exist within the project area. Further research and field verification would be required for a more thorough and accurate assessment of landslide and landslide-prone areas within the project area.” (Landslide Mapping Report, p. 1)

Why was the Landslide Mapping Report only “a rapid assessment” in June 2023 when the Baker City Watershed Fuels Management Project Draft EA came out much later, in March 2024, with no field verification to determine if there are any additional landslides and landslide prone areas? Why was it decided to keep this Landslide Mapping Report and all the other Specialist Reports outside the EA and thus harder for the public to access? Who made this decision? These reports are not too lengthy to include in a standard EA. The Specialist Reports were already in the standard format to incorporate in the EA.

The Landslide Mapping Report author acknowledges that this report is only “ a rapid assessment” with no explanation for the rushed process. The author of the Landslide Mapping Report, Keifer Nace, recognizes that the LIDAR assessments require field verification to be accurate: “As displayed on the map, the deposits have been mapped according to land boundaries rather than the extent of the deposit. Therefore, these deposits should be field verified in order to have a more accurate assessment of susceptibility within the project area.” (Landslide Mapping Report, under “Discussion and Conclusion”) This is inaccurate use of the science in that the landslide mapping is not complete and not field verified.

Burn blocks in the Inventoried Roadless Areas should not overlap the rockfall areas, as higher intensity burns than planned “could potentially cause an increase in mass wasting in the area in the event of high burn severity fires that could reduce vegetation and soil cover, reducing slope stability.” (Landslide Mapping Report, Table 3 under “Alternative 1-No Action”)

There should be no logging, road construction, road re-opening, or prescribed burning on “landslides, rockfalls, and landslide susceptible areas” as the author notes that PDCs [Project Design Criteria] would be needed to “potentially reduce the acceleration of mass movements caused by thinning and harvesting treatments or prescribed burning treatments.” (Landslide Mapping Report, Table 3, under “Alternative 2 & 3”)

The report author also identifies the need for PDCs to “protect public health and safety within the project area” with regard to the threats posed by “landslides, rockfalls, and landslide susceptible areas.” The author does not give any guarantee through analysis that soil and transportation project design criteria would prevent the acceleration of landslides and rockfalls, with the qualifiers of “potentially help” to reduce the acceleration of mass movements caused by logging or prescribed burning, or that public health and safety within the project area would be protected.

It’s critical for the public to know that: “Landslides, rockfalls, and landslide susceptible areas occur naturally throughout the project area” and that proposed commercial logging or prescribed burning could trigger dangerous landslides and rockfalls. Yet this information is not disclosed in the EA but instead kept out of the awareness of most of the public by limiting this to a Specialist Report in “the project file.” Most people would not realize that they would need to read the Specialist Reports to be informed of significant potential negative impacts from the proposed management actions.

Soil Report comments on Stand Resiliency to Ecological Stressors:

The condition of “over-stocked” trees typically results from either wildfire suppression (which is still done with most fires by the Forest Service) and/or from heavy logging stimulating re-growth of dense small young trees. Generally only non-commercial thinning or prescribed burning is usually needed to thin “unsustainably overstocked” trees since most re-growth from logging or from wildfire suppression stimulate the growth of small, young trees.

We agree with Mary Young, the author of the Soil Report, that: “Restoration of soil moisture and plant community ecological processes is also an important aspect of adapting to climate change and creating resilient landscapes.” (Soil Report, pp. 6-7)

Mitigation measures for soil impacts are often not implemented due to lack of funding. Therefore analysis should not assume that sale units that exceed the 20% of an area limit for detrimental soil conditions will have significant soil recovery “over time”.

Scientific Uncertainty:

There is no analysis demonstrating that under alternatives 2 or 3 “loss of ash cap soils wouldn’t be substantial and would be mitigated through BMBPs [Best Management Practices] and PDCs.” (Soil Report, p. 9) We find this hard to believe, given the steep slope and RHCA logging proposed in numerous commercial sale units with ash soils, which are the predominant topsoil in most of the RHCAs in higher elevations and moist mixed conifer and on steep slopes in the Municipal Watershed, including sale units off the Marble Pass road in the center of the Municipal Watershed and subsidiary roads, which are mostly closed.

Detrimental Soil Conditions:

Proposed sale units already exceeding the detrimental soil standard limit and those at or near the limit (e.g. at 17-20%) should not have heavy equipment use (including commercial logging and roading) as these types of management cause long-term detrimental soil impacts. If these detrimental soil impacts exceedances were always mitigated effectively, there wouldn’t be eight sale units exceeding the standard and more that are at or close to the DSI limit of 20%--from timber sales from the 1980s to the 2000s, as well as potentially from older timber sales.

To a large extent, the previously logged sale units proposed for more logging already have gaps in overstory or are missing historic large and old trees, with the current sale units already substantially thinned and opened. None of the commercial logging sale units we field surveyed “needed” more commercial logging. Some, especially in the drier area (e.g. in lower elevation or on south-facing slopes) could use non-commercial thinning of small trees up to 9”dbh and/or prescribed burning for dry forest types. We could still see the open overstory and open stand effects from past patch clearcuts with leave trees, commercial thins, so-called “improvement” cuts, overstory removal cuts, single tree selection cuts (mostly high grading) and pre-commercial thinning.

As the soil scientist acknowledges, many skid trails were poorly planned from past timber sales, with some uphill to downhill channeling of water and sediment down steep slopes to streams and long-term lack of regeneration in skid trails.

Drop the following sale units from any heavy equipment use, including commercial logging, grapple piling, or road construction or re-opening due to these sale units meeting or exceeding the detrimental soil standard limit of 20% of an area: sale units 309 (25%), 319 (20%), 326 (26%), 407 (25%), 421 (21%) 166R (30%), and 308A (30%), and the following sale units as near enough to the limit to exceed or reach the 20% limit, as a timber sale will typically increase detrimental soil impacts by at least 3-5%: sale units 310 (19%), 428 (17%), 604 (18%), 143R (17%), 177R (17%), and DFPZ sale units 25, 26, 27, and 28, all of which have 17% DSI. (See Table 3, Existing Detrimental Soil Conditions, pp. 11-14.)

Organic and Biological Soil Characteristics:

We are concerned that: “Compaction recovery rates are highly variable with an expected range of 10 to 70 years (Gonsior, 1983).” And we are also concerned that: “Monitoring of 71 units within the

project showed [that only] 51% of units visited had adequate down wood for soil productivity and nutrient cycling....[and] 37% of units visited had less than optimum wood....” (Soil Report, p. 15)

Sensitive Soils:

We want all commercial logging and heavy equipment use in planned sale units that are on sensitive soils to be dropped, including commercial logging and road construction or re-opening. These include sale units on the “thick ash cap soils”, which are a “sensitive soil type” and sale units in dry meadows with shallow soils, as well as all landslide prone areas and past landslide areas. Hydric soils are sensitive wetland soils (128 acres in the project areas) which need to be dropped from commercial logging, road construction or re-opening, and other heavy equipment use.

Drop sale units planned for logging or other heavy equipment use on the 1,970 acres of shallow soils, 271 acres of clay-dominated soil, and on the 7,751 acres of udic moisture regime soils—i.e. ash cap soils—in order to avoid long-term detrimental soil impacts. Note the legal requirements to avoid detrimental soil impacts and landslides under the list of relevant laws, regulations, and policies on p. 3 of the Soil Report.

Soil Erosion:

We are strongly opposed to logging on steep slopes—i.e. slopes > 30% or requiring cable yarding or “tethered” logging. As Mary Young, the report author notes: “Most of the project area is characterized by steep slopes > 30%”. (Soil Report, p. 17, 1st par.) Steep slope logging exacerbates ecological degradation, often with long-term impacts, such as yarding corridor clearcut scars that last for decades, logging ruts channeling fine sediment into stream systems, drying out moist forest sites and riparian areas and potentially triggering landslides or mass wasting. The Baker City Watershed project area has a high number of past landslides and landslide prone areas. Steep slope logging is more dangerous for loggers. Logging steep slopes and within RHCAs is in complete contradiction with the goal of protecting the Municipal Watershed, restoring riparian conditions, and protecting water quality and abundance. The author of this report notes that: “concentrated flows routed into first order drainages from infrequently large storms or snowmelt have the potential for high peak runoff flows” which decrease water retention in the Municipal Watershed. More severe storms from climate change causing more forceful precipitation runoff and sudden snowmelt runoff from rising air temperatures will increase the potential for high peak runoff flows, as a cumulative effect.

Soil Stability:

Drop all heavy equipment use, including commercial logging, road construction or closed road re-opening on the 2,324 acres of potential landslide acres. (See Table 4, Soil Report, p. 17)

Stand Resiliency to Ecological Stressors:

Confine management on the 11,504 acres of droughty soil types to non-commercial thinning up to 9” dbh and to prescribed burning in dry forest types, as droughty soils may have difficulty regenerating, especially under extreme climate change. Non-commercial thinning and prescribed burning would suffice to significantly reduce inter-tree competition from wildfire suppression and/or stimulated re-growth of dense small tree thickets due to overstory removal during moister years. Hiding cover patches should be retained where they appear vigorous and not adjacent to stressed mature trees. Forest Plan standards need to be met for hiding and thermal cover.

Environmental Consequences—No Action:

Physical Soil Characteristics:

Note the long-term impacts of ground disturbance—especially from heavy equipment use: “Most soil disturbances would recover after 70 years (Gonsior, 1983)....Displaced, rutted, and puddled soils would have reduced productivity for a longer time than compacted soils.” (Soil Report, p. 18, 3rd par.)

Organic and Biological Soil Characteristics:

In contrast, note the ecological benefits to soils; plant and tree growth; water retention; water quality; cooling effects and nutrient cycling, as well as to long-term tree and soil carbon sequestration and storage from the No Action alternative. (See Soil Report p. 18, par.s 4 and 5.) Regarding the benefits

of No Action, the Soil Report concludes that: “Any changes would be buffered by the capability of the soil microbial communities to adapt to changing conditions on short time scales (Schmidt et al., 2007).”

Other benefits of the No Action alternative include that: “No action would allow any current soil erosion to decrease as vegetation returns to soils that lack plant cover.” And: “Mass failures are unlikely with no management actions.” (Soil Report, p. 19, the two 1st par.s)

We support the No Action alternative over either action alternative, although we are open to non-commercial thinning by hand and prescribed burning in the lower elevation, drier forest closer to local communities. We are opposed to proposed management in the Municipal Watershed and the two Inventoried Roadless Areas.

The Soil Report supports our favoring hand-thinning and piling or mastication over grapple piling and burning: “Hand thinning and piling would not generate detrimental soil conditions, but the associated grapple piling, and pile burning could.” And: “Grapple piling and subsequent pile-burning generates approximately 5% DSC (Bliss, 2004; Hanson, 2005; Post-implementation monitoring).” And as: “Rubber tired skidders can also be used for grapple piling and creates higher detrimental soil disturbance.” (Soil Report, p. 19)

Detrimental soil disturbance effects are described for ground-based logging on Soil Report pages 19-20.

Steep Slope Logging:

There are many science citations in the Soil Report analysis on pages 21-22 that support our opposition to cable yarding and tethered logging. For instance, regarding cable yarding: “partial suspension means that logs are dragged across the soil, resulting in greater amounts of exposed mineral soil and rutting (Youngblood 2000). This is particularly evident on finer-textured or ash-cap soils (Youngblood 2000).”

We are concerned by the long-term yarding corridors being clearcut and potentially leaving deep ruts from partial suspension and the mature and large tree that would be strongly incentivized to be logged in steep slope logging.

Re: Tethered logging, the Soil Report author cautions: “Whole-tree tethered operations are the newest application of tethered operations, and very little is known about soil disturbance.... Application and advancements in tethered harvest systems has outpaced research on various sites and soil types (Holzfeind et al., 2020). Machines operating on steep slopes may cause increases in soil disturbance from track slippage, compaction, rutting and displacement as steep slopes are already vulnerable to these types of disturbances.” (Soil Report, p. 21, 2nd par.)

We are also concerned that: “In Washington on private industrial land, Chase et al. (2019) compared soil disturbance of tethered logging to cable- and winch-assisted operations on steep slopes. They found that stream-adjacent disturbance and soil disturbance associated with tethered logging on steep slopes is greater than that caused by conventional steep-slope harvesting practices, such as cable logging....” Further: “A main takeaway was that change in slope breaks to steeper ground led to deeper and longer rutting and increased bare soil especially when slopes steepened to > 60% (Prentice and Archer, 2023).” (Soil Report, p. 21, last par. into p. 22)

Helicopter logging for steep slopes would be cost prohibitive, as many of the steep slopes in the commercial sale units have already been logged, with most large trees removed already by high grading. This would also make cable yarding or tethered logging uneconomical. Other commercial sale units were either clearcut in patches with few mature trees retained or were in a similar condition due to past high severity wildfire.

Since steep slope logging and RHCA logging (which often overlap) cause the most disastrous impacts threatening the integrity of the Municipal Watershed and the RHCAs, all steep slope logging planned should be abandoned. The Forest Service needs to engage in a paradigm shift to stop logging

in some of the last high quality wildlife habitat on very steep slopes, including in never logged forest and in RHCAs.

Riparian Habitat Conservation Area logging:

We don't agree that the planned logging in RHCAs would be "outside of riparian ecosystems" as the entire "No Logging" buffers of PACFISH and INFISH prevent logging impacts to whole drainage moisture retention and recruitment of large trees into the future to form cool water pool refugia for fish and other aquatic and riparian wildlife such as amphibians, including Columbia Spotted frogs and possible salamander species, as well as macro-invertebrates. Full RHCA buffers also ensure the stability of slopes through tree retention above streams to prevent excess fine sedimentation into the streams and to retain tall tree shading of the drainage from slopes and in the whole extent of the RHCA to retain shading and increase moisture retention in flood plains.

Riparian ecosystems are not just riparian zones, but the broader setting. For instance, when a larger area can retain water and grow riparian hardwoods in the flood plain, this allows for beaver to build dams and create braided stream channels to keep the flood plain wet throughout. Many wildlife species come to drink in RHCAs and need outer RHCA forest hiding and thermal cover. Deer and elk both select RHCA areas for fawning and calving. Marten, wolves, lynx, and many other rare and declining wildlife species use the full riparian corridors for foraging or finding prey during migration and dispersal. Migrating and dispersing wildlife species need sufficient forest hiding and thermal cover for their security as they seasonally migrate, disperse for genetic diversity, or move to more suitable habitat due to climate change. For instance, Columbia Spotted frogs migrate from one drainage to another, but they require water retention in the streams throughout the drainages.

We field surveyed most or all of the sale units where RHCA logging was planned and it made no sense. The remaining large trees in the RHCA commercial logging sale units in the higher elevation Municipal Watershed were mostly Grand fir and Englemann spruce, with some old growth Western larch. Some of these RHCA sale units had been logged before, with partial high grading or overstory removal on the upper slopes of the RHCA. These RHCAs are inherently moist riparian areas, yet the past logging clearly set them back. They need more water retention from the moist mixed conifer cover, not less. Some of the upper slopes were thick with seedlings and saplings due to past logging or wildfire. We didn't find any RHCAs with excessive density of mature or large trees. Any logging or roading in the RHCAs would be detrimental, in opposition to the best available science that supported full INFISH/PACFISH buffers. Commercial logging would dry out the RHCAs and remove shading and large tree structure, reducing water retention for wildlife using the RHCAs, including fish and other aquatic and riparian species, during prolonged droughts or extreme heat waves under climate change. Biomass "fuel" reduction is also detrimental to moisture retention through removal of down wood and forest litter through piling and burning.

Commercial logging and/or road re-opening or road construction would significantly prevent the attainment of Riparian Management Objectives within the RHCAs. Logging and roading would channel excess sediment into the stream system, adversely affecting Threatened and Sensitive fish species, other aquatic species, and water quality.

"Temporary" Roads:

Drop the 10.3 miles of "temporary" road construction planned. As the Soil Report discloses: "they [the "temporary" roads] create 1.5 acres of DSC [Detrimental Soil Conditions] per mile." (Soil Report, p. 9) These could be very long-term detrimental soil impacts since RHCAs often have both hydric and ash soils, which are both sensitive soils. Further, the Forest Service hardly ever fully decommissions closed roads and "temporary" roads, including re-contouring slopes and planting native local plants on the road bed.

Summary:

As the Soil Report notes: "Since the 1990 Forest Plan, the level of concern for maintaining soil productivity has increased." Yet the Blue Mountains Forest Plan revisions have still not been done,

despite the NFMA requirement to revise the Forest Plans every 10-15 years. The past Forest Plan revision processes took up to 12 years and then were scrapped with no explanation to the public.

The Interior Columbia Basin Ecosystem Management Plan was based on sound science and would have fully protected large trees from logging based on the increasing deficit of large and old tree structure compared to historic conditions from overlogging for decades, yet it was thrown out as an apparent gift to the timber industry. The last Forest Plan revision attempt for the Blue Mountains seemed to be stalling the process and was incredibly legally insufficient, with hardly any legal standards and substance, and with the admission that the action alternative that would log the most would cause a boom-bust economic effect to local communities and that it was not sustainable.

After all these years of theoretical Forest Plan revising it seems that the Forest Service is trying to avoid revising the Forest Plans based on best available current science, so as not to have to change their mission by moving away from commercial logging. Current commercial logging to very low basal areas on a landscape scale on timber sale rotations as short as 30 years or less is not ecologically or culturally sustainable and increasingly it is economically unsustainable.

An outdated Forest Plan keeps the trajectory of Forest Service management confined to outdated science and an outdated mission to log every part of the Forest outside the Wilderness Areas, regardless of consequences like wildlife species going extinct and water quality and abundance from Municipal Watersheds being destroyed.

The Forest Service is still not disclosing the scientific controversy over the effectiveness of Best Management Practices.

- *Drop all of the commercial logging and heavy equipment use and all road construction or closed road re-opening in all of the 44 sale units (!) expected to exceed the 20% standard threshold for detrimental soil impacts. Soil impact mitigation is often not implemented due to lack of funding. It is also not 100% effective, as subsoiling or “tilling” deals only with compaction and mixes soil layers.

- *Exclude all heavy equipment use in these 44 sale units or just drop from any management all 44 sale units exceeding the DSI Forest Plan standard.

- *Drop all planned steep slope logging, including “Tethered” logging.

- *Drop all “temporary” road construction as these roads are hardly ever fully decommissioned through re-contouring and rehabilitation, such as increasing permeable soil and planting native plants in the roadbed. Most so-called “temporary” roads become de facto system roads and are often reconstructed as “temporary” roads on “existing disturbance” for the next timber sale. “Temporary” roads are hardly ever “obliterated” as claimed.

We are very familiar with the usual outcomes from timber sales over the last 33 years of timber sale monitoring, including returning to timber sale areas after logging to witness and document the outcomes. Many Forest Service promises have been broken, and inadequate PDCs still leave more ecological devastation with virtually every timber sale.

Due to planned heavy logging down to very low basal areas, the commercial logging and mechanical “fuels treatment” biomass reduction, plus prescribed burning will not “leave a sizable portion of the existing stand on site” (see Soil Report, p. 32, 1st par.) based on the EA itself and the proposed silvicultural management information.

Biomass such as organic forest litter and coarse wood debris that contributes so much to organic nutrients and moisture retention in soils is now being called “hazardous fuel loads” as public relations propaganda to justify the loss of soil nutrients, carbon storage, and water retention. Not much organic material would remain after logging, grapple piling, and burning, compared to natural unmanaged conditions.

50 square feet of material in hand piling is actually quite large and could cause over-heating of the soil below, losing soil nutrients from the pile burning. (See Soil Report, p. 32, 2nd par.)

Soil Biological Activity:

40 years is a long time for the forest to wait for microbial “measures” (organic nutrients) in logged areas to meet or exceed those levels of unlogged stands. Leaving never logged forest unlogged is a much better ecological outcome. Notably, there is no assurance as to how many dead and live trees would be retained. (See Soil Report, p. 32, last par.)

We agree with the Soil Report that: “Forest productivity depends on mycorrhizae for survival. Mycorrhizal fungi, like all fungi, are aerobes associated with the organic matter components of surface soils. Management activities that reduce aeration or soil organic matter (mechanical slash piling, and slash burning) will reduce mycorrhiza activity (Perry and Rose, 1983). Soil compaction, puddling, rutting, and displacement reduce gas exchange and could potentially affect soil micro-organism survival.” (Soil Report, p. 33, 1st par.)

However we don’t agree that: “Favorable habitat for soil organisms will be maintained since all proposed activity areas would be designed to reduce soil disturbance to meet Region 6 Soil Quality Standards,” (Soil Report, p. 33, 1st par.) since there is no analysis showing exactly how this will be done on a landscape scale, with all the biomass removing management proposed. Further, the Region 6 Soil Quality standards have been in effect for a long time and yet detrimental impacts increase with every timber sale, leaving the soils impoverished with long-term cumulative negative impacts to fertility, integrity, and productivity. Cumulative effects include all the planned ground disturbing heavy equipment use and the cumulative removal of biomass in combination with cattle over-grazing in the lower elevation dry forests and the lasting long-term detrimental soil impacts from past timber sales.

The analysis in many places does not support the conclusions of only “minor” effects. These summaries use weasel words like “various forms” or “a variety of” organic matter, without addressing how little organic matter may be left for soil nutrients. Notably, there is the conditional use of “should” be retention of organic layer on the soil surface “over at least 65% of the area” with no support from the analysis, and no explanation as to how this figure was derived, through what methodology. This 65% figure is apparently a goal of Soil PDC 3, rather than an outcome based on detailed in-depth analysis that quantifies the cumulative effects to the organic layer on the soil surface. (See Soil Report, p. 33, 3rd par. “Summary”.)

Sensitive Soils:

The qualified loopholes persist regarding protection of the soils. For example: “Shallow soils will not be used for skid trails, slash piles, or log landings *unless no other location is practical and there is an existing prism*, in which case ground-based equipment will remain within the existing prism *as much as possible*.” (Italics emphasis of qualification loopholes are ours, Soil Report, p. 33, 4th par.) This is not reassuring.

*Drop all heavy equipment use (including commercial logging, road work and grapple piling) on the 689 acres of shallow, clayey soils (<25 cm) within sale units.

“In Alternative 2 and 3, there are 4,947 acres of udic and thick ash cap soils within proposed activity units. Characteristics of these soils include low bulk density, high porosity, and high water-holding capacity. They have an excess of soil moisture either year-long or on a seasonal basis. They tend to be non-cohesive and because of their low bearing strength, are highly susceptible to both vibratory and compressive compaction.” (Soil Report, p. 33, 5th par.) The last thing the Forest Service should be doing in a Municipal Watershed is removing or displacing water retentive ash soils. Steep slope logging will likely displace ash soil layers no matter what ground conditions are, such as logging in dry seasons or when the ground is frozen.

*Drop the 4,947 acres of udic and thick ash cap soils within proposed management sale units under Alternative 2 and 3, so that there is no heavy equipment use on those sensitive soils.

*Drop all 66 acres of the hydric soils within proposed sale units, and buffer them so that there is no heavy equipment use on these sensitive soils in wetland areas. It sounds like this is planned.

There is no supporting evidence or analysis to justify the conclusions that management practices would sufficiently reduce impacts to meet Region 6 Soil Quality standards. (See Soil Report, p. 33, last par. into p. 34 under “Soil Erosion”).

Dismissal of significant cumulative effects of sedimentation to water quality and fish habitat:

The Soil Report states that: “Sediment from the permanent transportation system has direct effects on water quality and is not a component of the soil quality assessment process.... (Soil Report, p. 34, 1st full par.) Yet sediment from the permanent transportation system is a huge ongoing source of sedimentation of streams, with direct negative effects on water quality and fish habitat. Sediment from the permanent transportation system is being dismissed from the soil quality assessment process, which enables repeated timber sale closed road re-opening, construction of “temporary” or new system roads, and increased road use with no accountability through the soil quality assessment process. This shamefully skews the results of the soil quality assessment process to favor and allow increased road use, closed road re-opening, and increased road use during the 10-15 years of timber sale implementation estimated for the Baker City Watershed timber sale now proposed, as well as this flawed process being used to dismiss the effects of past and future timber sales. This thwarts adaptive management of not endlessly constructing new “temporary” roads, not re-opening closed roads, and not allowing timber sales and associated road work to systematically destroy fish habitat—including for Threatened and Sensitive fish species—and water quality over time through the cumulative additions of sediment from the permanent transportation system. And this biased soil quality assessment process is being used regarding proposed closed road re-opening, “temporary” road construction, and increased road use over 10-15 years of logging in the Baker City Watershed timber sale—all without consideration of the sediment inputs into streams from the permanent transportation system as a cumulative impact to water quality and fish habitat and with no quantification of cumulative increased sedimentation of streams from these sources. It’s outrageous that this process dismisses major cumulative effects to water quality and fish habitat in the Baker City Municipal Watershed!

Ground-based Logging and Biomass Reduction:

“Alternative 2 and 3 have 3,782 acres of soil types with high and very high erosion hazard. Soils with high and very high erosion potential make up 86% of ground-based activities in both alternatives.” (Soil Report, p. 34, 2nd full par.)

*Drop all heavy equipment use, including commercial logging, road building or re-opening, or grapple piling on the 3,782 acres of soil types with high and very high erosion hazard.

It is extremely unlikely that “disturbed areas within these units” would still retain a minimum of 60-90% (which is it?) of effective ground cover “following cessation of any soil disturbing activities” given the planned intensive biomass removal from the sale units, including logging to low basal areas plus non-commercial thinning and burning. (See the same par. as cited above.)

The analysis admits that there would be or could be an “increase in overland flow from existing areas of compacted soil” with mitigation by the buffering by the “existing forest floor and/or new accumulations of woody debris”—after most of the trees and other biomass have been removed! (ibid.) The lack of quantification of remaining forest floor organic matter and new accumulations of woody debris after logging and other biomass reduction enables such wishful thinking or provides a way to get the analysis to somehow lead to a conclusion of no significant impacts.

Tethered Logging:

“Abundant rainfall can saturate the soil within ruts and can consequently cause mudflows or landslides (Cambi et al., 2015). Ruts become preferential flow paths for water in steep terrain and may be dangerous foci for erosion, such as gullies. Significant soil disturbance (e.g. compaction, displacement, rutting) is more likely with harvesting activities on steeper slopes (Johnson et al., 2007). Steep slopes that compacted or rutted also have more runoff and erosion (Jansson and Johansson 1990, Cambi et al. 2015). Poorly planned skid trails constructed for harvesting operations are a concern,

particularly in steep terrain (Nash et al., 2022).” (Soil Report, p. 34, 2nd to last par.) These science findings support our concerns regarding both steep slope logging in general and “Tethered” logging. Prescribed Fire and Retaining PACFISH/INFISH RHCA Buffers:

“It is recommended that this project utilizes burn periods so that only portions of the watershed are incrementally impacted over the intended time frame. This should allow burned areas to recover and minimize potential sediment movement and delivery, especially when riparian buffers are maintained.” (Soil Report, p. 35, 1st full par.)

*Retain full PACFISH/INFISH buffers with no logging or road construction or re-opening or other heavy equipment use so that sediment flows from logging and other heavy equipment use do not reach the streams from the roads or adjacent sale units with soil disturbance from logging or other heavy equipment use. The full PACFISH/INFISH buffers would prevent logging erosion on the upper slopes of drainages or outer parts of the RHCA buffers and retain existing trees, large down wood, forest litter, and existing plant cover to keep sediment from being channeled down to streams and to retain moisture within the whole RHCA.

“Temporary” Roads:

“Alternatives 2 and 3 have 9.2 miles of temporary roads proposed on high erosion hazard areas. These roads will likely have short-term increases of soil erosion over 0.3 tons per acre per year. Erosion rates would decrease, as roads are rehabbed immediately following use.” (Soil Report, p. 35)

*Drop the 9.2 miles of “temporary” road construction on high erosion hazard areas. Erosion rate decrease after the road building is predicated on theoretical and effective rehabilitation immediately following use, which is unlikely.

We support needed culvert installation and replacement culverts, but not at the cost of the multitude of negative impacts from a destructive timber sale. Separate funding can be obtained for aquatic restoration work.

“In Alternative 2 and 3, there are 525 acres of proposed treatments in landslide prone areas.” (Soil Report, p. 36, 1st par.)

*Drop all 525 acres of proposed management in landslide prone areas. Actually, LIDAR mapping has to be field verified to identify potentially unstable areas before implementation of any management, not verification through LIDAR alone, as suggested. Soil PDC 11 apparently requires that: “To avoid management-caused mass failures, PACFISH/INFISH Category 4 buffers apply to all landslide and landslide prone areas (Soil PDC 11).” (Soil Report, p. 36, 1st par.) So this Soil PDC 11 should be followed by dropping all management from 525 acres in landslide prone areas, and buffered with Category 4 buffers from management—i.e. at least 50 foot buffers around the landslide prone areas, with no management in the buffer zones.

We are concerned that: “Abundant rainfall can saturate the soil contiguous to the ruts and can consequently cause mudflows or landslides (Cambi et al., 2015). This is a concern in tethered logging areas where terrain is steep.” (Soil Report, p. 36, par. 2)

Roads transecting landslide prone areas:

Consider permanent closure and decommissioning of any system roads that transect landslide areas. Use field verification of conditions and consider possible diversions for major access roads. (See Soil Report p. 36, par. 3)

Stand Resiliency to Ecological Stressors:

As we recommended earlier in these comments,

*Drop all heavy equipment use on the 8,769 acres of sensitive droughty soil types. It is not clear what management on droughty soils would “help maintain soil moisture and reduce ecological stressors to build forest resiliency” and with what level of effectiveness. (Soil Report, p. 36, par. 4)

Cumulative Effects:

Regarding cumulative effects to soil integrity, fertility, stability, and productivity, we are concerned that: “These predicted cumulative detrimental soil condition values are based on impacts prior to

required Soil PDCs. All units are expected to be within Forest Plan and Regional Soil Quality Standards if all required Soil PDCs are implemented.” (Soil Report, p. 36, underlining emphasis ours) The additional detrimental soil impacts from proposed management with heavy equipment use would increase cumulative effects over existing conditions, and there is no guarantee that all soil PDCs would be implemented or would be 100% effective. Notably, the Soil Report qualifies the use of PDCs “if” they are implemented. (Soil Report, p. 36, 1st par. under “Cumulative Effects”).

The cumulative effects analysis for soils reveals many controllable sources of potentially extensive detrimental soil impacts, including “no restriction on cross-country motorized travel”, “continual fuels reduction”, “frequent repeated burning”, and “sediment delivery concerns” from system roads.” Plus the cumulative effect that: “Future creation of non-system roads from woodcutting activities is reasonable to expect.” Yet all these continuing and expected sources of detrimental soil impacts are dismissed from further consideration as “too limited in aerial extent to measure.” (Soil Report, p. 36, last par.)

The Soil Report notes that: “There is currently active grazing in the Blue Canyon Allotment. There is potential for additional access for cattle into project units that were previously inaccessible, however impacts are anticipated to be too limited in extent to measure. Most grazing impacts are within riparian areas and water development areas. Grazing impacts could occur within areas of riparian proposed activities; however, this is limited in extent. Grazing impacts near water development areas could have limited areas of compaction or trampling of soil, however the potential impact would be too limited in aerial extent to be counted in DSC calculations....” (Soil Report, p. 37) The only terms of measurement are vague and unquantified, such as “limited in extent”, “limited areas”, “too limited in extent to measure” and “limited in aerial extent”. Apparently “limited” is the magic weasel word to avoid quantifying cattle impacts to riparian soils and consequent impacts to water quality and water abundance.

It is clear that rampant livestock over-grazing continuing over about a century on eastern Oregon National Forests has resulted in long-term degradation to riparian ecological processes and functions, in the context of a “sacred cow” syndrome. Yet these cumulative effects are not quantified or analyzed for combined effects with the planned Baker City Watershed project commercial logging and biomass reduction within Riparian Habitat Conservation Areas. This is inadequate cumulative effects analysis since cattle grazing in riparian areas can be severe: through trampling of stream banks and post-holing from the hooves of these very heavy animals causing widening of the streams—which makes water more shallow, with warmer water temperatures; related erosion of fine sediment into streams; heavy consumption of the stream water; overgrazing throughout the lush riparian areas creating barren ground next to the streams; hedging and elimination of riparian hardwoods that stabilize stream banks and shade the streams for cooler water temperatures (with loss of riparian leaf litter organic matter and loss of coarse wood debris) and introduction and dispersal of invasive plants by the cattle into the RHCAs, which may affect soil composition. Yet none of the well documented detrimental impacts to soils and the consequences to soils from livestock grazing in RHCAs identified above are disclosed and considered in the cumulative effects analysis.

The Soil Report discloses cumulative effects to soils from mining in the project area: “There are 27 mining claims within the project area, 9 of them are currently proposed in the Powder River Mining EIS. Mining activities remove fertile topsoil, encourage invasive weeds, and cause erosion. These ongoing and reasonably foreseeable activities are not expected to add to adverse cumulative watershed effects for the soil resource because these areas are administratively removed from the productive land base.” (Soil Report, p. 37) This is a handy way to dismiss significant cumulative effects of long-term or permanent loss of soil productivity, apparently based on the outdated Forest Plan.

“Direct and indirect impacts to soil productivity from mining is expected, however those impacts are outside the scope of this environmental analysis.” (Soil Report, p. 37) Somehow, despite disclosing

mining impacts as cumulative effects to soils in the project area, those impacts are deemed to be “outside the scope of this environmental analysis” with no explanation.

This is inadequate cumulative effects analysis in that it does not analyze in depth the combined effects of all these sources of detrimental soil impacts in combination with the action alternatives 2 and 3.

All the following sale units in Table 7 (Soil Report, pp. 37-43) with cumulative detrimental soil impacts at, near, or above the 20% DSI standard should be dropped from any heavy equipment use, including logging and road-building or re-opening. These include sale units: 308, 309, 310, 311, 319, 320, 322, 323, 324, 326, 327, (on p. 37) and sale units: 328, 329, 330, 332, 333, 334, 335, 336, 402, 404, 407, 416, 421, 422, 423, 424, 425, 426, 428, 430, 439, 600, 601, and 602 (on p. 38) and sale units on p. 39: 604 and 646, and sale unit 143R on p. 41, and on p. 42: sale units: 166R, 177R, 308A, 318B, 320A, 324A, 330A, 330B, 335A, and 335B, and on p. 43: sale units: DFPZ 25, 27, 29, 32, and 33 (all DFPZ sale units).

There is no cumulative effects analysis identifying the scale of these cumulative effects to soils within the project area. There is also no specific quantified analysis of the severity and extent of cumulative effects to soils that would or could overlap with proposed management actions identified as causing detrimental soil impacts. Cumulative effects analysis should disclose the results of these combined effects in quantitative terms, or based on qualitative ratings if quantification is impossible.

Ripping heavily used skid trails and landings only address compaction, and do not replace lost organic nutrients or reconnect mycorrhizal fungal connections necessary for trees to transfer nutrients and carbon to each other for increasing tree and forest resiliency to stressors such as defoliating insect epidemics. This mitigation measure does not fully restore soil integrity and fertility and may not be implemented or fully effective.

While the “goal of soil restoration is to create favorable conditions for impaired soils to begin the recovery process” (Soil Report, p. 44, 1st par.), the soil recovery process could be as long-term as 70 years or more. These are long-term significant detrimental soil impacts which are foreseeable and could be and should be avoided, as per legal requirements.

Duration of Effects:

The Soil Report confirms that: “Displacement and erosion, the loss of topsoil, is a long-term and perhaps a permanent loss of soil productivity....Compaction may last from 10 to 70 years (Gonsior, 1983). Monitoring of 40-year-old activities within this project area averaged 14% DSC, indicating some recovery of compacted soils has occurred.” Thus detrimental soil impacts from past timber sale “activities” 40 years ago have not fully recovered.

The Soil Report support our preference for low to moderate intensity prescribed burning—outside the Municipal Watershed and the two Inventoried Roadless Areas and only in dry forest types—instead of commercial logging for dubious fire risk reduction. (See Soil Report, p. 44, par. 3.)

The Soil Report claims that: “Any erosion that occurs would be short-lived” based on “the implementation of erosion control measures.” (Soil Report, p. 44, last par.) However, erosion doesn’t have to be continuing for the long-term to have significant impacts to water quality and to Threatened and Sensitive fish species habitat—especially from steep slope logging and logging of RHCAs, both of which are proposed management that need to be abandoned. Then later in the same paragraph the Soil Report confirms that: “However, if a landslide were to occur, duration of effects would be a long-term reduction of soil and forest productivity.” Landslides are more likely on past landslides, potential landslide areas, and high erosion potential areas that should be field verified and dropped from any heavy equipment use, including logging, road construction or re-opening, and grapple piling or mechanized non-commercial thinning. However all these landslide prone and high erosion potential areas should be buffered from any management based on Category 4 buffers being required to buffer these areas, as discussed above in our comments.

Summary of Environmental Effects:

* Re: Table 9 on Soil Report pages 44-45, we want all of the following sale units dropped from any heavy equipment use, including commercial logging, road construction or re-opening, and grapple piling: the 44 sale units with detrimental soil conditions exceeding the 20% DSI standard, the 5,702 acres of identified Sensitive soils, and the 3,782 acres of soils with increased erosion potential. (See Table 9, p. 44) We also want the following sale units to be dropped from any heavy equipment use in the 9.2 miles of “temporary” road construction planned on soils with high erosion potential, sale units on the 867 acres of landslide-prone areas proposed for management, and on the 8,769 acres of droughty soil types proposed for any heavy equipment use. (See Table 9 continued on p. 45) Compliance (or Non-compliance) with the Forest Plan and Other Relevant Laws, Regulations, Policies, and Plans:

The very outdated 1897 Organic Administration Act does require the Forest Service: “...to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows....” However the planned logging in RHCAs, on steep slopes, and within the Municipal Watershed would not “improve and protect the forest” and would not ensure “securing favorable conditions of water flows” from the Municipal Watershed and headwaters drainages.

We find that logging or roading in landslide prone areas and on high erosion potential soils, steep slopes, and within RHCAs would not meet the requirements of the Bankhead-Jones Farm Tenant Act of 1937 as stated on Soil Report p. 45, including cumulative management effects failure to “to correct maladjustments in land use, and thus assist in controlling soil erosion, preserving natural resources, mitigating floods, conserving surface, and subsurface moisture...and protecting the public lands, health, safety, and welfare.” (Soil Report, p. 45, 1st par.) Our earlier Soil Report comments support these concerns that these directions would be violated.

There is no guarantee that implementation of BMPs and PDCs would definitely be implemented or would ensure “continued water flows and productive lands...through implementation of BMPs and PDCs” or that the Forest Service would be sufficiently “mitigating soil erosion, preserving natural resources, and conserving surface and subsurface moisture through implementation of BMPs and PDCs.” (Soil Report, p. 45, 1st par.)

We don’t agree that the stated National Forest Management Act requirement would be met: “The NFMA requires that Forest Service regulations implementing the NFMA specify guidelines to ensure that timber will be harvested from NFS lands only where soil, slope, or other watershed conditions will not be irreversibly damaged. 16 USC 1604 (f) (E) (i).” (Soil Report, p. 45, 2nd par.) With logging or road construction or other heavy equipment use planned on landslide prone areas and high erosion areas, soils, slopes, or watershed conditions could be “irreversibly damaged” if the heavy equipment use triggered a landslide or mass wasting.

Notably, the KV funds prioritization for rehabilitation of non-system road templates would not avert a landslide or mass wasting event triggered by heavy equipment use in landslide prone or high erosion potential soils.

Forest Plan Compliance:

Based on Alternatives 2 and 3, the proposed management would not meet the Forest Plan standard WAW by not following the direction to “Give maintenance of soil productivity and stability priority over uses described or implied in all other management direction, standards, or guidelines.” Further the two potential action alternatives would not necessarily protect soil productivity through the direction to maintain a “minimum of 80% of an Activity Area shall not be detrimentally compacted, displaced, or puddled upon completion of activities.” Either of the two action alternatives, as proposed, would not “Emphasize protection over restoration” for all the 42 sale units planned for sale units planned for heavy equipment use that would be cumulatively at, near, or exceeding the 20% Detrimental Soil Impact standard based on Table 7 (17% cumulative DSI and higher).

Comments on the Potential Wilderness Areas and Inventoried Roadless Areas Report:

The Specialist Report on Potential Wilderness Areas and Inventoried Roadless Areas does not disclose or analyze the ecosystem services, such as high quality wildlife habitat for far-ranging and declining wildlife species, primitive recreation opportunities, and high quality headwaters water quality and abundance for downstream fish and local communities' water supply.

By keeping the only discussion of Potential Wilderness Areas, Inventoried Roadless Areas, and undeveloped lands out of the EA, the Forest Service is keeping the values of these never logged and roadless areas and the foreseeable impacts of the proposed management actions to these areas out of the attention of the public.

Notably, there is no environmental effects analysis in this report or the EA for effects from the Baker City Watershed project to Potential Wilderness Areas, Inventoried Roadless Area, a major part of the Baker City Municipal Watershed overlapping the IRAs, and the undeveloped lands. This Specialist Report is not a substitute for in-depth, detailed environmental effects analysis.

Only the perceived benefits of management in these areas are disclosed, without considering the negative impacts of proposed management to these wild lands, which could impair water quality and abundance, fragment the forest cover, degrade wildlife security habitat, disrupt or destroy the solace and natural forest values of primitive recreation, and cause loss of potential carbon sequestration and storage in these natural forest carbon sinks to reduce the effects of extreme climate change.

The report discloses that: "An analysis of the Potential Wilderness Area is required as part of the presentation for public scoping, given the proximity of the project area to the Inventoried Roadless Areas...." (p. 1, 1st par.) Yet there is no analysis in the report of environmental effects to these areas.

"The process for evaluating Potential Wilderness Areas (PWA) occurs in four primary steps: inventory, evaluation, analysis, and recommendation. This report serves as the first of the four steps and is not necessarily intended to produce the result of wilderness." (p. 1) So the report itself acknowledges that the report is only an inventory of Potential Wilderness Areas and does not include "evaluation, analysis, and recommendation." Thus this report cannot substitute for the requisite environmental effects analysis for the Environmental Assessment regarding to Potential Wilderness Areas, the two Inventoried Roadless Areas, and undeveloped lands.

We are strongly opposed to any of the planned management that would be within Potential Wilderness Areas, Inventoried Roadless Areas, the two Inventoried Roadless Areas, undeveloped lands, and the overlapping Baker City Municipal Watershed.

Re: Table 1: Drop all Baker City Municipal Watershed Area that overlaps the IRAs from any management, including "Defensible Fuel Profile Zones" and prescribed burning. The Forest Service needs to respect the need to not manage last wild lands that have not been logged or roaded.

Re: Table 2: Drop from any management all adjacent acreage qualifying as Potential Wilderness Areas.

We are concerned that the report omits from consideration wild lands that are in segments less than 5,000 acres that could increase the acreage of existing Potential Wilderness Areas, Inventoried Roadless Areas, and Wilderness Areas: "There are other segments significantly smaller than 5,000 acres that are not identified as having self-contained ecosystems and cannot be effectively managed as a separate unit of the National Wilderness Preservation System, therefore are not mentioned in this report." (p. 3) We are strongly opposed to logging, closed road re-opening, or road construction (including "temporary" roads) or any other heavy equipment use in the mentioned "segments significantly smaller than 5,000 acres." We request full disclosure of how large in acres each "segment" is, where these are located throughout the project area, including maps of all these areas disclosing the size of each undeveloped land area, as well as the location.

Usually such inventory, disclosure, and consideration for Potential Wilderness Areas includes blocks of 1,000 acres or more, not only areas that are 5,000 acres or greater. By setting a 5,000 acre limit instead, this Potential Wilderness Area inventory is purposefully eliminating consideration for Potential Wilderness Areas that are between 1,000 and 5,000 acres. This is not consistent with the other Blue

Mountains National Forests' Potential Wilderness Area inventories. Apparently some of the Wallowa-Whitman National Forest staff have a strong bias toward logging and roading as much of the Forest as possible, ignoring the unique ecological, scientific, and cultural values of forest lands that have never been logged or roaded.

We are concerned by the Forest Service's cumulative conversion of more reference condition undeveloped lands into heavily manipulated forest that has lost most of its integrity and biodiversity due to heavy extensive logging and road construction across almost all National Forest lands outside of Wilderness Areas and Inventoried Roadless Areas. The Forest Service needs a paradigm shift from resource (life source) extraction and ecological destruction to preservation of mature and old growth forest and ecologically sound restoration, as well as the protection of last wildlands—Potential Wilderness Areas, Wilderness Areas, Inventoried Roadless Areas, and Undeveloped Lands—from logging, roading, heavy equipment use, and other manipulation that would change the wild character of these lands.

Re: Table 3, p. 5: "Map 3: Acres Removed from Inventory due to past harvest" is noted as only "Some of these acres may overlap with acres of past harvest." So which is it, "due to past harvest" (past timber sale logging and roading) or how much of it has actually not been logged or roaded? How much acreage that has never been logged or roaded is being thrown in with other acres that have been logged and roaded? What's going on with this inventory? Are only a few acres to a few hundred acres of past logging and roading being used to eliminate much larger acreage, say, up to 5,000 acres, from consideration for Potential Wilderness Areas?

We want full disclosure of whether these acres are all previously logged or roaded or not, with maps showing what portions of these acres may not have been affected by past logging and/or road construction. We want all areas that have not been definitively logged and/or roaded to be preserved in an unlogged and unroaded state, with no heavy equipment management. The Forest Service needs to be transparent about potential negative effects to all acres that have not been logged or roaded. These determinations should be verified by satellite or aerial imagery (e.g. LiDAR) combined with field verification on the ground. We strongly oppose any logging, roading, or heavy equipment use on any lands that have not been logged or roaded in the Baker City Watershed project and in general.

*Reconsider the 4,576.25 acres removed from inventory due to past "harvest", as some of these acres may not have been previously logged or roaded. See the paragraph above of our comments. Drop any acres that have not been previously logged or roaded and classify those areas as either Potential Wilderness Areas or Undeveloped Lands.

*Drop all 15,674.78 acres of undeveloped lands within the Baker City Watershed Project planning area (which are also classified as acres of Potential Wilderness Areas in Table 3) from any logging, road construction or closed road re-opening, or any other heavy equipment use. Drop all management proposed for the Potential Wilderness Areas that overlap the Baker City Watershed Project Area that could prevent or degrade conditions for potential Wilderness designation.

*The Wallowa Whitman National Forest staff need to protect at least the specified 66,672.85 acres of Potential Wilderness Areas from logging, road construction, and any heavy equipment use so that these areas could be designated as Wilderness Areas or used to expand the boundaries of adjacent Wilderness Areas or Inventoried Roadless Areas to preserve back country wild lands for: wildlife security habitat; retention of large forest carbon sinks to reduce global warming effects; scientific study using undeveloped lands and Potential Wilderness Areas for natural reference conditions for research; headwaters protection for fish species, water quality, and water abundance downstream; and for primitive recreation and indigenous people's exercise of their treaty rights and protection of sacred sites and cultural uses.

*We oppose further management within the Inventoried Roadless Area boundaries even if they have been logged or roaded in the past, except for any hiking trail maintenance.

Comments on the Draft Wildlife Report:

It is very concerning that science-based professional analysis for the Specialist Reports is being excluded from the EA, and thereby not seen by the majority of the public who want to submit comments. The public would expect the environmental effects analysis to be incorporated within the EA. People who don't read the EA right away may not have the time to get copies of all the reports and write comments in response to them. For instance, while I am in rural eastern Oregon for seven months of the year, I have no regular or easy internet access for receiving the Specialist Reports electronically. Further, the copies of the reports mailed to me were only received very late in the time allotted for receiving public comments. These included reports that didn't come through successfully electronically.

Based on the analysis for American marten (aka "Pacific" marten) both action alternatives would greatly reduce suitable marten habitat by removing substantial tree density, removing large live trees for future large snags and logs under alt. 2, and planned significant reduction of both canopy closure and complex physical structure near ground level:

"Martens retain complex physical structure in the forest understory contributed by coarse woody debris and lower branches of trees and shrubs (Buskirk and Ruggiero 1994, Witmer et al. 1998, Bull and Heater 2000). A complex physical structure near ground level provides protection from predators, protective thermal microenvironments, and access to the subnivean space where most prey are captured during winter (Buskirk and Ruggiero 1994, Witmer et al. 1998, Bull and Heater 2000)...Based on research data compiled in the DecAID Wood Advisor (Mellen-Mclean et al. 2009) for eastside mixed conifer forests, 70% of martens in the populations studied used snags >23.9 inches DBH for denning and resting, and down wood >20.7 inches DBH for denning, resting, and foraging." (Wildlife Report, p. 11)

Further, both action alternatives would fragment existing habitat and reduce suitable habitat overall. We found suitable marten habitat especially within the Municipal Watershed area off the Marble Pass road (some of these sale units are mapped as not within the Municipal Watershed possibly due to past logging or being within the road buffer) and in the higher elevation RHCAs. Martens need extensive, connected habitat:

"Martens in northeastern Oregon exhibited larger home ranges than those found in many studies with an average home range size of 2,717 ha (27 km²) for males and 1,416 ha (14km²) for females (Bull and Heater 2001). Bull and Heater (2001) recommended managing larger areas (27 km² per breeding pair) for marten in northeastern Oregon. Managing for adjoining home ranges and allocating appropriate patches of habitat within 33 km (mean dispersal distance) will increase the probability of retaining viable populations (Bull and Heater 2001). Martens will not travel far from substantial overhead forest cover, so preserving direct corridors between suitable habitat is essential (Witmer et al. 1998). Habitat used for dispersing or traveling...generally has a canopy closure $\geq$ 50%, a large down wood component, and a high density of trees (Bull et al. (2005))."

"Habitat fragmentation at the landscape and stand scale can pose a threat to marten population viability....An ongoing factor contributing to habitat fragmentation on the Wallowa-Whitman is the high density of roads and associated reductions in snags and logs from firewood removal and danger tree management." (both quotations on Wildlife Report p. 11, last two par.s)

Cumulative negative effects to marten are described in par. 1 of Wildlife Report p. 12. These include trapping, too much human access during the winter, and mortality from predation or lack of prey abundance and availability.

The Wildlife Report states that: "...some of these risks may be mitigated by increasing habitat quality and quantity. Recommendations for managing marten habitat in Oregon include maintaining currently occupied habitat, minimizing forest fragmentation around populations, and restoring functional landscape connectivity to enable recolonization (ODFW Conservation Strategy 2019)." The Forest Service needs to follow the Oregon Department of Fish and Wildlife Conservation Strategy 2019.

“While furbearer trapping records are too sparse to derive a trend in the population, they do confirm the persistence of a population in the Blue Mountains (Penninger and Keown 2011). Results of occupancy surveys in 2010 detected marten in six of seven sample units on the Wallowa-Whitman (Penninger and Keown 2011). In addition, the Wolverine Foundation and the Oregon Department of Fish and Wildlife have detected marten at multiple locations throughout the Eagle Cap Wilderness during carnivore surveys.” (both quotations above from Wildlife Report, p. 12, 1st & 2nd par.s)

The need to protect marten viability is based on its presence in the Wallowa-Whitman National Forest, inadequate population surveys, and its “Vulnerable” ranking in Oregon. Oregon Wild staff detected multiple martens in the Morgan Nesbit sale area on the Wallowa-Whitman NF, not far from the proposed Baker City Watershed timber sale, the Clarks timber sale, and the Suffering Springs timber sale. These three proposed timber sales cumulatively pose risks of significant habitat loss for marten on the Wallowa-Whitman NF.

“A viability outcome score was calculated for both the Blue Mountains and the Wallowa-Whitman, and the score was nearly the same at either scale. However, habitat is estimated to currently exist in the quality, quantity, and distribution capable of supporting a viable marten population on the Wallowa-Whitman (Penninger and Keown 2011).” (Wildlife Report, p. 12)

Habitat for marten currently exists on the Wallowa-Whitman NF, but based on existing widespread negative habitat impacts from logging, roading, and biomass reduction, the Forest Service needs to protect and preserve remaining suitable habitat for marten in the Baker City Watershed project area and across the Forest to prevent loss of marten viability on the Forest.

*The Forest Service needs to drop all proposed commercial logging sale units and sale units with biomass “fuel” reduction, prescribed burning, or road construction or road re-opening within the identified 8,790 acres of marten source habitat within the four watersheds that overlap the Baker City Watershed project area. “These watersheds currently provide $\leq$ 40% of the median amount of source habitat that occurred historically, which is below the threshold necessary to support marten population viability (Penninger and Keown 2011).” (Wildlife Report, p. 13)

“According to a GIS query, the Baker City Watershed project area contains 830 acres of marten source habitat that could contribute to a stable or increasing population....In addition, the project area contains 2,572 acres of secondary habitat that could be used for foraging, resting, or traveling...and 5,435 acres of potential habitat that currently does not provide habitat but could potentially provide marten habitat at some time in the future....” (Wildlife Report, p. 13, 2nd par.)

*Drop any planned commercial logging, road construction or road re-opening, and prescribed burning in the 830 acres of marten source habitat, and within the 2,572 acres of secondary habitat, and within the 5,435 acres of potential marten habitat within the Baker City Watershed project area. Any planned management that would be harmful to marten (as listed above) in those acres of marten source habitat, secondary habitat and potential habitat could be replaced with just non-commercial thinning up to about 9” dbh without piling and burning, or else the sale units could be completely dropped.

The marten’s very large home ranges do not have to be all ideal source habitat, but there is a pressing need to preserve as much suitable marten habitat as possible to protect the marten’s viability on the Wallowa-Whitman National Forest. More forest must be allowed to develop the complex ground structure, higher canopy closure, greater tree density, abundant down and elevated logs, and continuous forest cover that marten require for their habitat. It is important for the Forest Service to remember that American marten is a Management Indicator Species, which requires the Forest Service to protect marten viability under the National Forest Management Act, to retain the habitat structure for many other wildlife species that have the same habitat needs as marten. There are other wildlife species, including MIS Rocky Mountain elk, that would also find marten habitat suitable for their needs.

Environmental Consequences to Marten:

Alternative 2 and 3:

“Due to the decrease in canopy cover, treatments under alternative 2 and 3 are expected to remove marten source habitat. Silviculture treatments proposed under alternative 2 and 3 would remove 148 acres (1.68%) of existing source habitat (table 2). Impacts to marten source habitat are expected to last several decades as canopy closure recovers and tree diameters increase during that period.” (Wildlife Report, p. 13)

*Drop all of the 148 acres of existing marten source habitat in commercial logging sale units.

*Drop all prescribed burning in marten source habitat and secondary marten habitat, including dropping all commercial logging in the RHCAs and dropping prescribed burning within the moist mixed conifer forest in the Municipal Watershed area and in the RHCAs.

*Marten likely use RHCAs and Wildlife Connectivity Corridors for migrations, dispersal, and foraging, along with many other wildlife species. Drop any planned commercial logging in the Wildlife Connectivity Corridors and don't do prescribed burning in the connectivity corridors that are within moist mixed conifer or cold upland forest.

*Drop any commercial logging, road construction, road re-opening and prescribed fire in secondary marten habitat and potential marten habitat. Non-commercial thinning without piling and burning and without significant biomass removal could retain the suitability of secondary and potential habitat for marten.

Prescribed fire tends to eliminate many of the abundant down and elevated logs that marten require for subnivean winter foraging, protection from predators and protective thermal micro-environments, as well as travel runways.

*Drop the planned prescribed burning of 145 acres of potential marten habitat.

The Wildlife Report finds that: “Removal of mistletoe-infected trees within currently suitable marten habitat would degrade habitat quality. Proposed treatments would reduce available resting structures for marten and potential prey species that use these structures. In some areas, removal may also limit recruitment of future down logs. Retention of mistletoe-infected trees, 21 inches DBH or greater, would allow some treatment units to retain a level of resting structures likely to be more beneficial to marten and prey.” (Wildlife Report, p. 14, par.3)

*Drop all commercial logging in potential and suitable marten habitat as they also need denser forest and higher canopy closure as well as intact, unfragmented forest cover and abundant down logs.

Marten have been found to avoid crossing clearcuts.

Cumulative Effects:

Hazard tree removal along roads for commercial timber sales and within the sale units degrades and removes snag habitat, which harms marten and many MIS Primary Cavity Excavating woodpeckers, so we ask for scaling down the timber sale logging and road work significantly by not re-opening closed roads or building “temporary” roads.

Summary of Effects:

Loss of wildlife species viability is cumulative, with each timber sale contributing to loss of suitable habitat for species needing denser forest and large trees, such as marten. Switching the scale of the analysis from project area to Forest-wide for wildlife species viability is a fallacy when it is used to be able to claim that the decrease in habitat quality or abundance would “be insignificant at the Forest scale” (Wildlife Report, p. 14, last par.) and that “impacts at the Forest scale would be immeasurable” (ibid.) without taking into consideration all the other timber sales across the Forest that are being implemented or planned that would have significant cumulative effects to wildlife species like marten. Marten are known to be “one of the most habitat-specialized mammals in North America (Bull and Heater 2001).” (Wildlife Report p. 11, 1st Marten par.)

If commercial logging and biomass reduction at ground level and fragmentation of forest cover by constructing “temporary” roads and re-opening closed roads were not implemented, then the marten would have a chance to have source habitat to develop and reach levels above the threshold needed to retain the species' viability. Logging suitable marten source habitat, secondary habitat, potential

habitat, and wildlife connectivity corridors and RHCAs, along with widespread prescribed burning and biomass reduction at the ground level, would be a death sentence for the local marten population. This is unnecessary and avoidable.

Northern Goshawk:

Science cited regarding threats to future goshawk viability include the following:

“Several factors are cited by researchers and managers as potentially detrimental to current and future goshawk viability.... However, the primary concern throughout the goshawk’s range is habitat alteration due to timber and fire management practices (Squires and Kennedy 2006).

Potential threats to habitat caused by various silvicultural treatments include forest fragmentation, creation of even-aged and monotypic stands, potential increases in younger age classes, and loss of tree species diversity (Desimone and DeStefano 2005, Squires and Kennedy 2006). Harvest of mature forest decreases goshawk nesting habitat (Reynolds et al. 1992). Desimone and DeStefano (2005) also report that reduced proportion of mature closed- canopy forest, which is subsequently replaced by early successional forest, reduces the probability of an area as a potential nesting habitat. More severe alterations such as clearcuts, and moderately high alterations such as partial removal of stands resulting in <50% canopy closure, reduce the likelihood of goshawks reoccupying the area due to deterioration in the quality of potential nest areas (Desimone and DeStefano 2005). Greenwald et al. (2005) point to studies conducted after 1992 that show goshawk avoidance of open areas and early-seral forests, and that logging reduces goshawk occupancy and productivity.” (Wildlife Report, p. 16, last two par.s)

Other negative cumulative effects of the proposed Baker City Watershed project include higher open road density “which may result in the loss of snags and down wood habitat important to goshawk prey (Wisdom et al. 2000).” (Wildlife Report, p. 17, 2nd par.) Opening the forest too much by logging to the lower management zone of basal area retention planned would expose goshawks to predators such as larger raptors and owls, including Red-tailed hawks, Great Horned owls, and Long-eared owls (Crocker-Bedford 1990, Erdman et al. 1998), with Great Horned owls preying “on both adult and nestling goshawks (Boal and Mannan 1994, Erdman et al. 1998, Rohner and Doyle 1992).” (Wildlife Report, p. 17, 3rd par)

We are concerned that: “Wales (2011c) conducted a fine-scale analysis of source habitat on National Forests in the Blue Mountains, including the Wallowa-Whitman National Forest. This analysis indicated that there has been a relatively small (-6%) decline in the amount of source habitat on the Wallowa-Whitman from historical conditions.” We are worried that by now the decline in source habitat for goshawk has become greater since 2011, since current timber sales across the Blue Mountains National Forests are now usually on a landscape scale, with more intensive logging, such as the low basal area retention planned for the Baker City Watershed timber sale.

Any commercial logging should retain all trees ≥ 15 ” dbh and $> 40\%$ canopy closure to retain habitat suitability for warm dry forest types and $\geq 60\%$ canopy closure for cool moist and cold dry forest types. See Table 4 (Wales 2011c) on Wildlife Report p. 18. Regarding the “dry” Grand fir Potential Vegetation Group (PVG), this is probably a moist mixed conifer type that may have been dried out by past logging. Usually this “dry” Grand fir PVG has Big leaf huckleberry, which is a moister plant community indicator. Logging the forest overstory can cause loss of moister PAG indicator plants, based on our field experience—a logging change moving away from historical conditions.

Species Viability and the shifting scale of analysis:

The current viability outcome index for Northern goshawk for the Wallowa-Whitman NF is “slightly lower than for the entire Blue Mountains.” Most currently proposed timber sales across the Wallowa-Whitman NF would remove significant acreage of suitable habitat for goshawk on a landscape scale since the Forest Service is targeting denser forest in all forest types and planning to log to very low basal areas, potentially log large trees, and log within old growth structure, which would add up to significant elimination of canopy closure $> 40\%$ and $> 60\%$. These proposed timber sales include the

huge Morgan Nesbit sale, the Patrick sale (in implementation stage), the Baker City watershed timber sale, the Mt. Emily CE timber sale, the Clarks timber sale, and the Suffering Springs timber sale. These sales represent some of the current and planned cumulative acreage of lost suitable habitat for various wildlife species, such as Northern goshawk, marten, and the Primary Cavity Excavating woodpeckers—on the Forest scale. Yet Forest Service staff have not been adding up and disclosing the cumulative habitat loss at that scale in their EA and EIS analysis.

Significance of the Baker City Watershed project area's contribution to goshawk viability:

"The four watersheds within the Baker City Watershed project area have high WWI scores [Weighted Watershed Index], meaning that it likely provides a significant contribution to goshawk viability on the Forest. It also provides more than 40% of the estimated historical median amount of source habitat, which is considered the threshold for population viability....this watershed currently provides a significant amount of high-quality source habitat (20,401 acres)....the Baker City Watershed project area contains 4,427 acres of goshawk source habitat that could contribute to a stable or increasing population. In addition, the project area contains 12,707 acres of potential habitat that currently does not provide habitat but could potentially provide goshawk habitat at some time in the future...."

(Wildlife Report, p. 19, 1st and 2nd par.s)

* Goshawk can tolerate limited, light non-commercial thinning and careful prescribed fire, outside of the reproductive season except within the 30 acre buffers around goshawk nests. Drop all commercial logging, road construction, and closed road re-opening in any designated 400 acre Post-Fledging Areas. Light and patchy non-commercial thinning could be used outside of the goshawk reproductive season (including fledging) up to about a quarter of the PFA, with no piling and burning, away from the nest if the small trees are exceedingly dense. Don't commercially log the potential goshawk habitat acreage in the project area.

There is 4,427 acres of goshawk source habitat in the Baker City Watershed project area.

*Drop all 262 acres of commercial logging and prescribed fire in goshawk source habitat, since logging and prescribed burning would eliminate Northern goshawk source habitat suitability.

Dropping the commercial logging from goshawk source habitat is warranted, as: "Commercial harvest treatments would likely reduce average stand diameter and/or canopy closure below suitable levels, thereby removing source habitat for the next several decades." By comparison, "Non-commercial treatments may simplify stand structure over the next 20 years but would retain the characteristics of source habitat, including a residual canopy greater than 40 percent."

*Drop any planned biomass "fuel" reduction in all 1,720 acres of source habitat. Light hand thinning of small young trees in patches might retain goshawk source habitat suitability. Drop hand piling and burning to retain more ground level habitat for goshawk prey. Otherwise there could be too much simplification of stand structure over the next 20 years, potentially eliminating 1,720 acres from being high quality goshawk source habitat for at least 20 years. See the Wildlife Report Table 6 and the third par. from the bottom of p. 20: "As a result of projected habitat loss under the Baker City Watershed project, source habitats would decline under alternatives 2 and 3 by approximately 1,720 acres...."

Pileated Woodpecker:

"In northeastern Oregon, the Pileated woodpecker has shown a preference for mature, unlogged Grand fir stands with at least 60% canopy closure, multiple canopy layers (>2), and high snag density (Bull and Meslow 1977, Bull 1987, Bull and Holthausen 1993). Bull et al. (2007) found that densities of nesting pairs were beneficially associated with the amount of late structural stage forest, adversely associated with the amount of area dominated by Ponderosa pine and the amount of area with regeneration [clearcut] harvest....nest success was higher in home-ranges that had greater amounts of forested habitat with $\geq 60\%$ canopy closure (Bull et al. 2007)." (Wildlife Report, p. 22, 1st par.)

*All commercial logging needs to be excluded from suitable Pileated woodpecker habitat since planned logging would reduce canopy closure to $< 60\%$, remove multiple canopy layers, reduce high

snag density, and under alt. 2, remove needed large tree structure. Prescribed burning must be dropped in suitable Pileated woodpecker habitat in moist mixed conifer forest, as burning would remove soft snags and logs (usually Grand fir) needed for Pileated woodpecker foraging (and Black bear foraging).

“Old growth stands of Grand fir, with >60% canopy closure and little or no logging activity are preferred sites for roosting (Bull et al. 1992).”

Home Range Size:

“Bull et al. (2007) utilized data from many of these previous studies, comparing density of nesting pairs and traditional home ranges on 30 years of data on two study areas and 15 years of data on five study areas on the WWNF and Umatilla National Forest. The average territory size (including habitat and non-habitat), considering all seven study areas was 1,561 ha (3,857 acres) and [the] average amount of suitable habitat within the territory was (765 acres).” (Wildlife Report, p. 23) Therefore Dedicated Old Growth areas (or Old Growth Management Areas) of 300 acres and Replacement Old Growth and Pileated Woodpecker Foraging Areas, which are often not suitable Pileated habitat are not enough to maintain viable levels of Pileated source habitat per pair to ensure population viability.

Threats to the Species:

“Bull (1978) and Bull et al. (2007) report that timber harvest has had a negative effect on this species. Removal of large diameter live and dead trees, of down woody material, and of canopy, reduces nest and roost sites, foraging habitat, and protective cover. In addition, prescribed fire may eliminate or reduce the number of snags, logs, and cover (Bull 2003). Firewood collection and snag felling along roadsides also reduces the availability of snags for nesting and roosting.” (Wildlife Report, p. 24)

Existing Condition:

Blue Mountain/WWNF Population Viability—

“Source habitat is defined here as: habitat with single-story and multi-story dry Douglas fir and dry Grand fir with greater than 40% canopy cover, trees greater than 20” DBH, as well as cool moist and cold dry single-story and multi-story forest with canopy cover greater than 60%, and trees greater than 20” DBH. This analysis indicated that there has been a decline in the amount of source habitat on the Wallowa-Whitman from historical conditions, with forty of the forty-nine watersheds (82%) analyzed for the Pileated woodpecker on the Wallowa-Whitman having less source habitat than the estimated historical condition....Currently, there are approximately 206,374 acres (57% of historical condition) of source habitat on the Wallowa-Whitman.” (Wildlife Report, p. 24, last par.) Since loss of suitable Pileated woodpecker habitat on the Wallowa-Whitman has reduced source habitat to only 57% of the historical condition, the Forest Service should be protecting all remaining Pileated woodpecker source and secondary habitat to allow more forest to develop into Pileated source habitat.

The viability of Pileated woodpecker won't continue much longer on the Wallowa-Whitman NF if the Forest Service continues to log and burn Pileated source habitat and secondary habitat. Why is HRV used to rationalize logging, but not to prevent or avoid management related to wildlife species decline? This represents a huge agency bias toward logging, regardless of the consequences to wildlife species viability on the Forest.

* Drop the 389.7 acres within the riparian areas under alternatives 2 and 3 that are also Pileated woodpecker source habitat. We are opposed to all commercial logging in riparian areas and to prescribed burning and mechanical biomass reduction in moist mixed conifer RHCAs.

*Drop all commercial logging, mechanical biomass reduction, and prescribed fire within the 142 acres of identified Pileated woodpecker source habitat. (See Table 8, Wildlife Report, p. 26)

“Under both action alternatives, commercial harvest treatments would likely reduce average stand diameter and/or canopy closure below suitable levels, thereby removing source habitat for the next 30-40 years....Prescribed fire and mechanical fuel reduction treatments were found to reduce the amount of foraging habitat (snags, stumps, and down logs) and abundance of ants (prey) of the Pileated woodpecker in the short term (1 to 3 years) (Bull et al. 2005).”

We support retention of all snags > 12" dbh, to provide for foraging by Pileated woodpeckers and other MIS Primary Cavity Excavating woodpeckers and other birds, such as Chickadees and Nuthatches.

*Drop the 805 or 806 acres of Pileated source habitat affected by commercial logging and prescribed fire (142 acres) and non-commercial thinning (663 acres) which are considered Pileated source habitat loss: "As a result of projected habitat loss under the project, source habitats would decline by 806 acres under alternatives 2 and 3..." (Wildlife Report, p.26—See also Table 8 on p. 26)

Cumulative Effects analysis:

The Cumulative Effects discussion re: alternatives 2 and 3 should have included disclosure and analysis of the cumulative effects from past logging in likely suitable Pileated woodpecker source habitat, yet past timber sales affecting Pileated woodpeckers are not even mentioned, let alone analyzed for cumulative combined effects to Pileated woodpecker viability. The past effects to wildlife species cannot be legitimately dismissed as part of "the existing condition" since the purpose of NEPA analysis of past, current, and foreseeable future effects are required to be analyzed in detail in order to learn from past management impacts and avoid them in subsequent timber sale or project proposals.

We oppose the foreseeable and avoidable loss of habitat projected for at least one breeding pair of Pileated woodpeckers. Losing a breeding pair is not "insignificant" even at the Forest scale, in that loss of species individuals and breeding pairs lead to loss of populations cumulatively and to potential local population extirpation, leading to a trend toward uplisting the species.

Rocky Mountain Elk and Road Density:

There should be no closed road re-opening unless the roads are being maintained for seasonal use and there should be no "temporary" road construction, which is often continually used for access by ATVs. This would help provide more elk security than planned. Since 73% of the project area is <0.5 miles from a road (See Table 11, Wildlife Report p. 31), many closed roads should be fully decommissioned and any redundant or ecologically damaging open roads should be closed and decommissioned for better elk security habitat in large blocks and to benefit other wildlife species, such as songbirds and owls that avoid roads.

The Forest Service should not allow continued exceedance of Forest Plan standards for road density: "Road densities would be slightly reduced under both action alternatives, but would continue to exceed Forest Plan standards in subwatersheds that are currently exceeding standards (Table 12)." (Wildlife Report, p. 32)

Big game winter range should not be commercially logged, as winter range tends to be in lower elevations with sparse forest cover. Elk need winter thermal cover to protect them from increasingly severe winter storms under escalating climate change. Mule deer are more vulnerable to dying during severe winters and are already in sharp decline throughout most of the region.

Connectivity of Old Forest (LOS) Habitat:

We are opposed to commercially logging the wildlife connectivity corridors to provide more thermal and hiding cover as wildlife species migrate (such as elk, deer, and marten) or disperse for genetic diversity (e.g. Gray wolf, Canada lynx, and Pacific fisher) and for many wildlife species to escape the extreme effects of current and escalating climate change, such as extreme heat waves, prolonged drought, and potential higher intensity fires. We are not opposed to non-commercial thinning up to 9" dbh where small trees form dense thickets from apparent wildfire suppression. Prescribed fire in dry forest types could also thin wildlife corridors to potentially reduce fire intensity and inter-tree competition for water.

*Drop all commercial logging in the 4,199 acres of wildlife connectivity corridors. Most tree density is only up to about 9" dbh in the project area.

Primary Cavity Excavators:

Re: Table 14, p. 37: Based on my field observations of birds over up to six National Forests for 33 years of summers, the population trend data for Cavity nesting birds in eastern Oregon correlates well

with my field surveying observations of birds. My sense is that the Northern Three-toed woodpecker is also in decline, with increasingly rare sightings compared to the 1990's. The Three-toed woodpecker is dependent on old growth Lodgepole pine forest which has been decimated by the Forest Service clearcutting Lodgepole pine stands for decades, setting them back to dense young Lodgepole pine thickets, which are also more flammable than more mature stands.

Notably many of the cavity nesting MIS Primary Cavity Excavating bird species of the most regional concern are dependent on large trees, which are systematically being planned for reduction by the Forest Service currently and prior to the Eastside Screens decision in 1995. These PCE woodpeckers of most regional concern include the large tree-associated species: Lewis' woodpecker, Northern flicker, White-headed woodpecker, and Williamson's sapsucker. These declining population trends indicate the need to prohibit logging of all large trees, which are at a great deficit compared to historic conditions, and to allow far more mature forest to grow into large and old growth structure for wildlife, large wood recruitment for stream pool formation, carbon sequestration and storage, and recreational and cultural use values, such as sense of place and indigenous people's spiritual values and cultural practices.

We are very concerned by the long-term regional population trends of Primary Cavity Excavating bird species, which has been decreasing for six out of eight species, including Blackbacked woodpecker; Lewis' woodpecker; Pygmy nuthatch; White-breasted nuthatch; White-headed woodpecker; and Williamson's sapsucker. Out of these, three species are strongly decreasing: Lewis' woodpecker, Pygmy nuthatch, and White-headed woodpecker, all of which are dependent on large/old trees.

"The predominant wildlife habitat types within the watershed that have proposed silviculture treatments [commercial logging] is the eastside mixed conifer habitat type.

*We want all Eastside Mixed Conifer forest type sale units to be dropped from commercial logging, which would negatively affect the most moisture-retaining forest type. Most of the dry forest types in the project area have already been heavily logged, so the Forest Service is moving on to liquidate the more protected forest in the RHCAs and within or adjacent to the Municipal Watershed. The Forest Service would also be targeting large trees for removal under alternative 2, as well as mature forest that needs to be allowed to grow into large trees to maximize carbon sequestration and storage and support wildlife species dependent on denser mature forest, large trees, old growth structure, and moister forest.

Would Forest Plan standards for snag abundance and size be met? This doesn't seem to be addressed directly in the analysis for PCEs.

Summary:

We are concerned that: "Proposed tree density reduction treatments would reduce risk of insect and wildfire disturbance within the project area, thereby reducing the potential for future pulses of habitat suitable for Lewis', Hairy, and Black-backed woodpeckers within a large portion of the project area." (Wildlife Report, p. 44) There is a natural ecological balance between defoliating insects, wildfire disturbance and native woodpecker species that help control the extent of insect outbreaks. We need to support the viability of these woodpecker species.

Comments on the Wildlife Biological Evaluation:

Threatened-listed Canada lynx should have been analyzed for potential effects, given that there are two big Inventoried Roadless Areas in a wild state, with likely heavy snow in the winter at high elevation. This is likely good habitat for Canada lynx with winter habitat up high and potential summer foraging habitat in the lower elevations. Lynx are also far ranging. We have had a sighting of lynx by three volunteers at a high elevation in the Ochoco National Forest around 2003, and two positive daylight sightings that I had of a lynx in dry forest between Spray and Fossil in the summer, with one sighting of a lynx running toward the John Day River at only about 1,000 feet elevation—within the last several years. It's not as if lynx no longer exist. The lynx habitat units where they were

thought to exist were abandoned based on politics at the USFWS, not on science. What kind of surveys have been done for lynx in the project area and the Inventoried Roadless Areas? What methods were used to detect lynx and on what dates, with what results?

Threatened-listed wolverine might also inhabit the Inventoried Roadless Areas and the Municipal Watershed. There would potentially be enough snowpack in the IRAs for denning in the high elevations and in the Municipal Watershed for foraging and security habitat. A pair of wolverines forage over 150 square miles. There is no reason to think that wolverine or lynx could not be in the project area. What kind of surveys were done for detecting wolverine presence? What methods were used on what dates, and in what locations, and with what results?

Under alternative 2, with logging of large trees, habitat for both Lewis' and White-headed woodpeckers (both Sensitive-listed) would be reduced.

Columbia Spotted frogs are likely to be using the Municipal Watershed RHCAs. The potential harm to Columbia Spotted frogs from commercial logging and potential road construction or re-opening in RHCAs is not limited to stream crossings, as Columbia Spotted frogs migrate out of the water from one drainage to another.

All of the listed mollusk species that have potential habitat or have been documented there could be harmed by commercial logging and heavy equipment use in RHCAs—in part through loss of moisture retention and potential excess sedimentation of streams. All logging and heavy equipment use in RHCAs need to be dropped to benefit many wildlife species, including Bull trout, Redband trout, and other Threatened or Sensitive fish species in the project area. These are Sensitive-listed species that are already in decline either due to declining population numbers or due to significant current or predicted downward trends in habitat capability that would reduce a species' distribution. Thus potential habitat degradation and potential crushing of individuals with heavy equipment during logging or other heavy equipment use in RHCAs.

The inadequate analysis fails to ensure that Forest Service actions will not contribute to the loss of species viability or cause a species to move toward federal up-listing, as extirpations of populations increase further declines through cumulative effects. No significant impact determinations are hinging on unidentified PDCs that may not be implemented or be effective

Since the Shiny Tightcoil “was documented in moist, multistory old forest within the project area”, RHCA logging, any other heavy equipment use, and burning should be abandoned. Dropping logging and other heavy equipment use, and burning in RHCAs in moist multi-story mixed conifer forest in RHCAs would benefit the following riparian-associated Sensitive species: Blue Mountain snail, Shiny Tightcoil, Fir Pinwheel, Umatilla Megomphix, and Thinlip Tightcoil.

We are especially concerned about the Sensitive riparian-associated wildlife species, including the Columbia Spotted frog, which “have been documented throughout the project area where suitable habitat exists”, and the mollusks: The Fir Pinwheel has been found on the La Grande District in 2016, and forest-wide surveys conducted by district biologists found this species at multiple sites within dry and moist forest associated with high canopy cover (>65%). Logging and other heavy equipment could kill any number of this Sensitive species. “Threats include logging of high canopy cover moderate elevation Douglas fir forest....” The presence of riparian habitat provides potential habitat for Blue Mountain snail...—if it isn't crushed by heavy equipment and commercial logging in the RHCAs. The Umatilla Megomphix was found during surveys on the Wallowa-Whitman in 2016 in three locations. “There is potential habitat for this species within the project area based on the presence of conifer forests and riparian areas.” This is an exceptional concentration of potentially multiple Sensitive species of mollusks in the RHCAs! The commercial logging and heavy equipment use in the RHCAs has to be dropped.

Re: the Lewis' woodpecker analysis: We are concerned that “Large Ponderosa pine, Western larch and Douglas fir snags are uncommon in the project area because of past timber management, road building, and firewood cutting. A snag analysis shows snags >21” dbh are deficient in most abundance

classes across most of the project area.” (Wildlife Biological Evaluation, p. 6) Yet large tree logging is planned under alternative 2, even though there is a clear deficit of large trees throughout the project area, including large snags, compared to historic conditions.

Large trees require 100-150 years to become large (and old growth by 150 years) trees. This is a fallacy to claim that large tree removal by logging somehow “would increase the potential of the project area to provide habitat”, whatever that means. It certainly would not increase large tree habitat. Likewise, it is the height of hypocrisy to claim that logging large trees in RHCAs to reduce the density of trees would be “to promote larger tree growth—by removing existing large trees! Large trees are not contributing to excess tree density, as there is no excess density of large trees due to past logging and fires.

Northern Bald eagle and Fringed Myotis bats also need large tree structure that would be removed under alternative 2 and would be reduced by logging of mature trees that would otherwise grow into large and old trees under both action alternatives.

Comments on the Botanical Resources Report:

Executive Summary:

Re: Whitebark pine:

Assuming that “short-term localized effects” to Threatened-listed Whitebark pine will not be part of cumulative effects leading to long-term loss of Whitebark pine populations is not warranted. We are concerned that “Whitebark pine is known from the project area and is **likely to be adversely affected** by project activities.”

*Drop the commercial thinning around existing Whitebark pine, especially as most of the Whitebark pine is seedlings and saplings, which could easily be missed as such during a commercial logging operation, which would inevitably remove Whitebark pine seedlings and saplings through heavy equipment use, non-commercial thinning, and prescribed burning.

*Drop the non-commercial thinning and prescribed burning where there is known to be Whitebark pine seedlings and saplings. This is not a species that evolved with frequent, low intensity wildfire. Further, this tree species could easily be mistaken for a fir seedling or sapling, as it is bushy and hard to identify if you are not familiar with it. Managing all around and through Whitebark pine seedlings and saplings is a prescription for getting rid of the species, not for its restoration.

In our field surveying experience, Whitebark pine are not generally crowded by other conifers as their habitat is “usually fairly dry sites with thin, rocky, cold soils”, which is our experience in mature Whitebark pine habitat on the Deschutes National Forest. If there are many other conifers in dense configurations at lower elevations, this may not be suitable habitat for Whitebark pine. Commercial thinning around the Whitebark pines should be unnecessary.

It's questionable whether there has been significant wildfire suppression effects in typical high elevation Whitebark pine habitat, which would experience infrequent high intensity wildfire.

We agree that climate change intensified heat waves and prolonged droughts are a threat to Whitebark pine. However, logging is also a clear threat to Whitebark pine, as they can be easily mistaken for Grand fir without careful inspection of needles. Non-commercial thinning by hand and potential pruning of adjacent lower conifer branches can yield much more restorative results.

We are not aware of any Baker City Watershed Entomology Report and did not receive a copy if it exists.

*Dropping all commercial logging and re-opening of closed roads and/or construction of “temporary” roads in RHCAs and in cool moist forest would better protect most of the sensitive and special status nonvascular plants, lichens, and fungi, as described in Table 3—for 8 out of 10 of the Special status non-vascular plants in Table 3, including all but the Maple liverwort and the Shieldscale liverwort. Likewise, of the Special status/Sensitive vascular plants in Table 3, most of them are dependent on riparian areas, moist or wet meadows, or damp to wet forests, including fens and stream-sides. These vascular plants—11 out of 20—would likely be harmed or eradicated by commercial logging and

roading in RHCAs and in moist forest. These include the *Botrychium* species, Green spleenwort, Clustered Lady's slipper, Northern twayblade, Small northern bog orchid, and *Swertia perennis*. We share the botanist's concern that: "For many of these 21 species, the primary threat to individual plants and essential habitat is the introduction and spread of invasive plants." The proposed management actions for the two action alternatives would cumulatively cause widespread barren ground after commercial logging to very low basal area retention, non-commercial thinning, grapple piling and burning, DFPZ creation, and prescribed burning—creating perfect conditions for introducing and dispersing invasive plant species. This is another reason we want the timber sale and biomass removal to be either dropped altogether or significantly scaled down, with some areas not managed at all, including the moist mixed conifer forest and the RHCAs. So much commercial logging and biomass reduction is absurd and unwarranted when only non-commercial small tree thinning up to 9" dbh and prescribed burning only in the dry forest types could easily reduce inter-tree competition and fire risk significantly.

Please send us any photos, descriptions, and/or drawings for identifying these 25 Sensitive plant species listed in Table 1 for the Baker City Watershed project area so that we can identify these plants in the field as much as possible.

We are concerned that *Botrychium* species may be missed in surveys due to being hard to detect and since they don't emerge from below the ground every year.

Methodology:

The EA avoids responsibility for species uplisting and loss of population viability by saying: "...if potential impacts are possible at the Forest level, the range-wide status of the species will be used to determine if the effects of the project will lead to a trend toward Federal listing." This is a loophole to avoid culpability for contributing to federal uplisting of plants and wildlife species, in that cumulative effects on the project level add up cumulatively to uplisting and potential loss of species viability. The current and near future effects to the species are not disclosed or analyzed from across the National Forest or analyzed to determine species viability.

Information Gaps:

These are significant information gaps for assessing the status of Sensitive plant populations on the Forest. There should be more exact or complete distribution and range information, population trends, responses to fire, and effective management areas and habitat characteristics necessary to maintain populations of special status plants. Without filling these information gaps, the Forest Service really doesn't know the status of Sensitive plant populations—especially at the Forest scale, or how to protect and restore the populations. This indicates the need for the Forest Service to at least monitor and identify these gaps to inform adaptive management. However, other Sensitive plant analyses on other Forests don't seem to have all these information gap problems. The information gaps are necessary to remedy to have accurate Project Design Criteria to maintain or restore populations. PDCs are obviously not enough to avoid Sensitive plant up-listings and loss of viability, especially if the plants are not fully buffered from such impacts as commercial logging, heavy equipment use, and road construction and re-opening.

Whitebark pine viability:

4,200 acres of Whitebark pine represents unusually large distribution for one project area. About how many Whitebark pines are in each acre? How many of those acres are suitable habitat? If this is mostly suitable habitat, it seems to be a stronghold for Whitebark pine that needs to be protected from too much manipulation. The significance of this Whitebark pine should not be downplayed by comparison with the Forest scale. How much of the 619,890 acres of Whitebark pine on the Forest is in protected Wilderness Areas and Inventoried Roadless Areas?

Forest Service Sensitive Plant Viability:

Commercial logging and biomass reduction both increase the spread of invasive plants, cause landscape simplification, and accelerated growth of dense non-commercial size seedlings and saplings.

Mature Whitebark pine trees evolved with high intensity, infrequent wild fire. So high intensity wildfire is not an evident risk to Whitebark pine, based on their habitat and evolutionary historical conditions. Commercial thinning among Whitebark pine could pose significant risks to Whitebark pine and their habitat, as the habitat already tends to have marginal soils and little conifer competition in that typical habitat.

*Drop the 81 acres of commercial logging planned for Whitebark pine habitat. We are not reassured by such language as “remove desired trees” and the inclusion of “Special Treatment Areas” as boundaries could be unclear and indirect effects could occur, such as drying out the site, erosion, soil compaction, and fragmentation of mycorrhizal fungi connections to transfer nutrients to the Whitebark pines. The potential impacts from commercial logging are the more apparent risks to Whitebark pine viability in the project area.

*Based on the Effects description for prescribed burning of Whitebark pine areas, we oppose prescribed burning in areas of Whitebark pine. See Table 6.

It is not reassuring that the effects description concludes that there are benefits only “for the Whitebark pine that are left after implementation.”

We support planting of Whitebark pine rust resistant seedlings in suitable sites at high elevations where they naturally occur. We support the use of Verbenone. Careful non-commercial thinning by hand of other conifers by people who know how to identify the seedlings could be acceptable.

We are wary of using prescribed burning in high elevation cold forest which is subject to infrequent high intensity fire. Commercial logging is unlikely to increase Whitebark pine habitat or to reduce future Mt. Pine beetle outbreaks.

This is highly hypocritical and unsupported analysis. The short-term and mid-term impacts to Whitebark pine are critical to Whitebark pine viability, not just theoretical long-term benefits that are not substantiated as to claimed long-term “increase [of] the quality and quantity of habitat for Whitebark pine.”

*Drop all commercial logging, mechanical biomass reduction, closed road re-opening or road construction, and prescribed burning within the 4,200 acres of occupied White bark habitat.

Management destructive to Whitebark pine is not justified since the project-specific purpose includes restoration and protection of existing Whitebark pine.

*Re: Sensitive plants: Drop prescribed burning during the Spring reproductive season, which could harm Sensitive plant reproduction. Drop all mechanical biomass reduction in Sensitive plant population habitat.

We support dropping most or all of the commercial logging and dropping all “temporary” road construction and closed road re-opening, as well as mechanical biomass reduction and grapple piling, as these management methods are likely to introduce and distribute invasive plants.

We support the Project Design Criteria for protecting Sensitive plant species listed under “Indicator 2. 3”.

Cumulative Effects:

The cumulative effects analysis is inadequate and incomplete. There is apparently no consideration of combined cumulative effects with proposed management impacts. Just a list of present and reasonably foreseeable future activities is not sufficient cumulative effects analysis, which also has to consider specific past effects in combination with current and foreseeable effects. There is mostly no detailed, in-depth analysis as to how these effects listed affect Sensitive plants. Apparently the list of present and reasonably foreseeable cumulative effects is buried somewhere in the project record, so people commenting can’t even see it.

As a general matter, it seems highly unusual to have generally combined the effects analyses for action alternatives 2 and 3 across all resources analyzed in the individual specialist reports. This can easily give the impression to the general public that there is no significant difference between an alternative that call for the logging or large trees and an alternative that does not simply because they

share the same acreage prescriptions between the two. The Final EA for the Baker City Watershed Fuels Management should separate out the effects analyses for these two alternatives in order to give the public the most clearly delineated idea of the difference between the two alternatives (although in reality, the Final EA for this project shouldn't have an alternative considering the logging of large trees at all, for reasons already discussed in these comments).

40 C.F.R. § 1502.14(b) requires that the Forest Service “[d]iscuss each alternative in detail, including the proposed action, so that reviewers may evaluate their comparative merit.” This would indicate there is some usefulness to the comparative style of analysis utilized here by the Forest Service for Action Alternatives 2 and 3. However, to truly evaluate the comparative merits of a project, the independent merits of each alternative must first be fully assessed, and this has not been accomplished in the Baker City Watershed Fuels Management Project Draft EA.

The entirety of the Draft Cumulative Effects Appendix B analysis runs afoul of Ninth Circuit case law that “requires some quantified or detailed information[.]” *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993 (9th Cir. 2004). Further, a proper cumulative effects analysis under NEPA “requires that an EA contain a discussion of reasonably foreseeable actions both within the study area as well as in the greater area.” *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1075 (9th Cir. 2002). This means that the Forest Service cannot summarily dismiss with the requirement for cumulative effects analyses by claiming that “[t]here are no present (ongoing) or reasonably foreseeable future activities that overlap in time and space with the BCW project[.]” Draft Silviculture Report at 48.

The cumulative effects analyses present in the Wildlife Specialist Report fail to identify and maintain a consistent geographic scale at which the analyses are taking place. *See generally* Wildlife Specialist Report 13–33. As such, sometimes “small negative effect[s]” to species such as Pacific Marten are dismissed as negligible because at the Forest scale, even though the Baker City Watershed project “may reduce habitat permeability at a localized scale,” resulting in the “availability of source habitats [that] would continue to be below the threshold needed to contribute to species viability on the Forest.” Wildlife Specialist Report at 14–15. Other cumulative effects analyses for wildlife species don’t even bother to provide an analysis of the effects of the proposed action alternatives beyond simply referring to the Cumulative Effects Analysis in Appendix B, which as stated above does not comply with the requirements for a detailed and quantified effects analysis. There needs to be more consistent and detailed information available to the public on the potential cumulative effects from the proposed action alternatives in order for this analysis to abide by the requirements of NEPA.

Comments on the Invasive Plants Report:

In this report, the Forest Service is not disclosing the scientific controversy over the accuracy of Fire Regime and Condition class models as a predictor of future fire behavior. There is no credible way to predict fairly exact acreage (i.e. up to 16,808 acres) of moderate to high intensity wildfire. This is especially the case since weather factors are the main driving factors influencing wildfires, not “fuel loads” or biomass. These critical weather factors include ambient air temperature, relative humidity, wind speeds, and precipitation, as well as the levels of moisture retention in the sites.

Heavy equipment use is a major cause of widespread invasive plant introduction and dispersal. The Invasive Plant report supports our concerns over road use and ground disturbance under Direct and Indirect Effects.

We request a significant reduction in the large number of acres proposed for biomass (“fuel”) reduction and dropping all prescribed burn ignitions in the back country Inventoried Roadless Areas, which could also establish invasive plants in the IRAs.

Management impacts cannot always be offset with the appeal to public fear of fire, which is now the agency's standard public relations propaganda. See our comments about scientific controversy over the efficacy of biomass reduction to reduce fire in our comments on the EA.

Alternative 2 and 3 Direct/Indirect Effects to invasive plant introduction and dispersal are High, not Moderate or Low. See Table 4.

The Invasive Plant Report acknowledges that the cumulative effects of the proposed action alternatives with other management has "the highest possibility of detrimental effects within the analysis area." (p. 10) This implies the need to scale down significantly the commercial logging, road construction, biomass reduction, etc. to greatly reduce the sources of ground disturbance and creation of bare ground.

The introduction and spread of invasive plants could greatly increase the acreage and duration of invasive plant populations, making them harder to control. It's also likely that many of the new invasive plant infestations won't be immediately or soon identified for management.

As Table 5 details, the increased cumulative changes in "acres of potential seed bed due to ground disturbance" and "change in acres of potential spread of invasive plants" could be overwhelming, indicating high risk of invasive plant introduction and dispersal due to the proposed action alternatives. See Table 5 pp. 10-11.

The Summary of Environmental Effects for invasive plants is flawed and biased by the assumption that alternatives 2 or 3 would actually reduce the intensity of the next wildfire, although post implementation conditions would result in a lot of barren ground seed beds for invasive plants, dramatically increase the introduction and dispersal of invasive plant seeds throughout the project area where management takes place, including in the IRAs, and with the much higher chance of starting a fire due to multiple ignitions in the IRAs over several years, likely with unpredictable and extreme weather conditions under climate change, such as heat waves and droughts.

This is another rubber-stamping conclusion: "we could predict a spread and establishment rate at the natural level for either of the action alternatives." What is the "natural level" of invasive plant spread and establishment? This is gibberish.

Blue Mountains Biodiversity Project was involved with stimulating and establishing the 2005 Region 6 ROD providing direction for control of invasive plants, with the goals stated on p. 12.

Re: Potential removal of trees 21" DBH or greater, the lack of analysis for proposed Action Alternative 3, and the disconnect between the Purpose and Need Statement and the limited range of alternatives considered

The stated purpose of the Baker City Watershed Fuels Management Project "is to reduce hazardous fuels between the Baker City Watershed and nearby private land," in order to "help protect the watershed and nearby private land holdings by reducing the risk of a high-intensity wildfire (crown fire) on public lands, and to provide a safer environment and better opportunities for firefighters to control a wildfire." Without commenting on the supposed need to log in order to achieve the worthy goal of protecting the watershed, communities, and firefighters from the risk of wildfire, the Forest Service is taking an enormous risk that may undermine any of its goals by planning and analyzing any action alternatives under the illegal 2021 Forest Management Direction for Large Diameter Trees in Eastern Oregon and Southeastern Washington ("2021 Eastside Screens Amendment").

As the Forest Service is aware, the embattled 2021 Eastside Screens amendment is currently the subject of two separate lawsuits challenging the legality of the amendment due to various violations of a number of bedrock federal statutes including NEPA, NFMA, the ESA, and the APA. District of Oregon Judge Aiken handed down binding orders in both cases on Friday March 29, 2024, affirming and adopting two separate District of Oregon Magistrate Judges' findings that highlighted

various Forest Service legal violations that occurred in the analysis and adoption of the 2021 Eastside Screens Amendment and recommendations to vacate the forest plan amendment.

In deciding whether to grant or deny the Forest Service's Motion to Dismiss BMBP's litigation over the 2021 Eastside Screens Amendment, District of Oregon Magistrate Judge Clarke found that, "[i]n sum, the Under Secretary's signature on a decision notice does not exempt a lower-ranking official's proposed plan amendment from the objection process," and therefore the Forest Service's "Motion to Dismiss [] should be DENIED." *Blue Mountains Biodiversity Project v. Wilkes*, Case No. 1:22-cv-01500-CL, Findings and Recommendation at 9-10 (D. Or. Apr. 27, 2023). In doing so, Magistrate Judge Clarke issued a sweeping Findings and Recommendation agreeing with all of BMBP's legal claims. Judge Aiken's adoption of these findings and recommendation allows BMBP's lawsuit to move forward to a decision on the merits. *Id.* Order at 1-2 (D. Or. Mar. 29, 2024).

Further, in a separate broader case challenging the approval of the 2021 Eastside Screens Amendment, District of Oregon Magistrate Judge Hallman found likely violations of NFMA, the ESA, and NEPA. When it comes to the amendment's effect on ESA-listed species, "the record does not support the Service's assumption that the Screens Amendment would have no effect on listed aquatic species. Thus, this Court concludes that the Service violated the ESA when it failed to conduct a biological assessment for aquatic species." *Greater Hells Canyon Council v. Wilkes*, Case No. 2:22-cv-00859-HL, Findings and Recommendation at 18 (D. Or. Aug. 31, 2023). When it comes to the failure of the Forest Service to prepare a full EIS for the 2021 Eastside Screens Amendment—instead relying on a lesser EA—Magistrate Judge Hallman found that "there is substantial uncertainty as to how the Forest Service will apply the Amendment's flexible and vaguely worded guidelines across millions of acres of federal land and whether the Amendment will create an important shift in species composition or minimal alternation to the status quo," and as such, "Plaintiffs have raised substantial questions as to the Amendment's highly uncertain environmental impacts." *Id.* at 27. Given the totality of the facts and circumstances surrounding the 2021 Eastside Screens Amendment, Magistrate Judge Hallman recommended that Plaintiffs' Motion for Summary Judgment be granted and that the 2021 Eastside Screens Amendment be vacated via an injunction and declared illegal, with the Forest Service instructed to prepare a full EIS for the amendment. *Id.* at 35-36. Judge Aiken's Order adopting of these Findings and Recommendations vacated the 2021 Eastside Screens Amendment until the Forest Service prepares a full EIS. *Id.* Order at 4-5 (D. Or. Mar. 29, 2024).

All this to say, the illegality of the 2021 Eastside Screens Amendment is now clear. The District of Oregon has vacated the 2021 Eastside Screens Amendment until such time as a full EIS can be completed, and therefore the original provisions of the Eastside Screens that require the retention of all live trees ≥ 21 " DBH must be complied with. If the Forest Service were serious about protecting communities and the Baker City Watershed from potentially dangerous and devastating wildfire, then it took an unnecessary risk by planning silvicultural prescriptions under the illegal 2021 Eastside Screens Amendment up to this point in the project's development when it was likely to be ruled illegal. Now, the Forest Service's insistence on relying upon the challenged 2021 Eastside Screens Amendment despite its dubious legality will undoubtedly create delays—delays that could have been easily avoided—to what the Forest Service believes to be a Project necessary "to improve forest health and resiliency to disturbance, reduce the risk of wildfire, increase structural complexity and species diversity of forest vegetation providing habitat to a wider range of wildlife species and economic benefit to the local economy." The Forest Should **must** plan silvicultural management prescriptions affecting large trees under the original provisions of the Eastside Screens.

The lack of detailed analysis provided for “Action Alternative 3 - Modified Proposed Action *without* Harvest of Trees 21” dbh of Greater” is disappointing in this regard, especially when there is an acknowledgment that this action alternative “would respond to the purpose and need to improve forest health and resiliency to disturbance, reduce the risk of wildfire within the wild urban interface, increase structural complexity and species diversity of forest vegetation providing habitat to a wider range of wildlife species and provide economic benefit to the local economy.” Draft EA at 16-17. Indeed, it seems the only reason this alternative is not the preferred action alternative is because conditions would not move as far toward the HRV as the Forest Service would prefer. However, given an increasingly fire-prone climate, it is unclear why the Forest Service believes the pre-colonial range of variability (as HRV is generally defined) to be the best adapted range of variability for today climate over 100 years later.

Why, then, is the Service so determined to log large trees—trees that are already rare on the landscape and that protect watershed water quality and provide invaluable natural ecosystem functions such as carbon sequestration and wildlife habitat, *see* Mildrexler et al. (2020)—when the purpose and need of the project can be met while leaving these large trees on the landscape? Moreover, the logging of large trees would actually only hinder the purpose and need of the project, as large trees are already the most fire-resistant trees on the landscape. *See generally* Moris et al., 2022.

There is a clear disconnect between the purpose and need of this project and the silvicultural prescriptions analyzed in detail in the EA. Such a disconnect does not comply with the requirements of NEPA. *See* 40 C.F.R. § 1502.13 Purpose and need (“The statement shall briefly specify the underlying purpose and need *to which the agency is responding in proposing the alternatives including the proposed action.*”) (emphasis added). Given that the purpose and need is met without logging large trees, and in addition to the fact the 2021 Eastside Screens Amendment has been declared illegal, no alternative that calls for the logging of large trees—including any alternative that may be developed in the future utilizing a site-specific amendment—should be considered for approval as part of the Baker City Watershed Fuels Management Project. An alternative that BMBP would be interested in seeing analyzed is one that does not require a return to some perceived historic range of variability and instead focuses on the current climate and conditions that are likely to continue into the future. Under these current conditions, the Forest would need as many large trees as possible of all species in order to maintain and improve fire resistance, maintain existing carbon stores, and preserve the greatest potential for future carbon sequestration. An alternative that does not call for any commercial or non-commercial thinning within RHCAs is also due analysis.

Re: Compliance with E.O. 14072 on protecting MOG forests

Why is there absolutely no discussion of how this project meets the objectives set forth in President Biden’s Executive Order 14072 “Strengthening the Nation's Forests, Communities, and Local Economies”? The section of the Draft EA discussing “Pertinent Executive Orders” doesn’t even contain a passing mention of the fact that there is an active Executive Order that requires the Forest Service to “conserve America’s mature and old-growth forests on Federal lands.” E.O. 14072. Despite this being “the policy of [the Biden] administration,” the Draft EA clearly indicates that “[c]ommercial and non-commercial treatments are proposed with OFMS under both action alternatives to increase resiliency with these stands to insect and disease as well as wildfire.” Draft EA at 7-8. And beyond “increasing resiliency to insect and disease” not being a listed purpose and need of the project, the purely speculative threat of some potential future fire shouldn’t be used to justify the commercial logging of mature and old growth forest stands on National Forest System lands. This is especially true

when there is an Executive Order that explicitly calls for the protection of these mature and old growth forests.

There are also non-commercial management prescriptions analyzed for application within Old Growth Preservation Stands (MA-15). Draft EA at 8. However, there is shockingly little analysis in either the Draft EA or the Draft Silvicultural Report that indicates these treatments are necessary or designed for the conservation of mature and old growth forests. What is the purpose of a separate Silvicultural Specialist Report if there is not detailed analysis of treatments within old growth stands in either? There is no demonstrated need for treatments within old growth stands in either the Draft EA or the Silvicultural Report, let alone any confirmation that these treatments will result in the conservation of mature and old growth forests.

Re: Formal Request for Elevated Review of the Baker City Watershed Fuels Management Project by the National Forest System Deputy Chief

In conjunction with the December 20, 2023 Notice of Intent to prepare an EIS for a National Old Growth Amendment, Deputy Chief Forester Chris French circulated a letter intended to “reserve to the National Forest System Deputy Chief the decision-making authority over management of old growth forest conditions on National Forest System lands during the amendment process.” As such, “any projects proposing vegetation management activities that will occur where old growth forest conditions (based on regional old-growth definitions) exist on National Forest System lands shall be submitted to the National Forest System Deputy Chief for review and approval.

This language calling for elevated review is clearly mandatory and should not require any request in order for regional and local National Forest system land managers to submit their projects for review. And yet, there is no indication in the Draft EA materials that such mandatory submission to the Deputy Chief Forester for review has taken place or will take place before a Final EA and Draft DN will be published despite clear evidence that this project not only “propos[es] vegetation management activities that will occur where old growth forest conditions [] exist on National Forest System lands,” but actually proposes commercial and non-commercial logging of old growth stands themselves. *See* Draft EA at 7-8 (“Management of Old Forest Stand Structure” and “Management within Old Growth Preservation Stands (MA-15)”). This is a formal request that the Baker City Watershed Fuels Management Project be submitted to the National Forest System Deputy Chief Forester for formal review prior to a final decision being made.

Aquatics-focused comments for the Baker City Watershed DEA

INTRODUCTION

Aquatic and riparian ecosystems are especially vulnerable to negative impacts from the loss of large trees (and the loss of recruitment for large tree structure), both from logging within RHCAs and from upslope logging. The EA failed to adequately disclose, analyze, or avoid the negative effects that increased logging of large trees would have on these ecosystems and the cumulative impacts of ongoing threats (roads, livestock grazing, fragmentation, climate change, logging, invasive species, etc.). The EA cherry-picked science and scientific interpretations that bolstered their desired outcome of logging within riparian corridors and logging of large trees, while ignoring or severely downplaying science that did not align with the agency's assumptions or conclusions.

OVERVIEW OF WATER QUALITY AND AQUATIC SPECIES CONCERNS:

The Draft EA's proposed logging in riparian corridors (RHCAs) and proposed logging of large trees, and heavy upslope logging including in important wildlife areas such as marten source habitat areas, flies in the face of widespread scientific consensus to increase core habitats and connectivity in response to climate change (Heller and Zavaleta 2009). The agency needs to consider how existing conditions and the proposed logging would potentially exacerbate possible negative impacts due to climate change. The EA has an extreme and disproportional emphasis on logging and fails to consider the importance of solutions to climate change that do not focus on logging.

Agency direction in the EA unfortunately does not align with addressing primary problems and drivers of water quality impairments and riparian habitat degradation such as roads, grazing, logging, and other actions that increase stream temperature and fine sediment loading. Grazing is a far more pervasive and direct threat to water quality and riparian ecosystems than the Forest Service's perceived forest species composition issues. For example, the Blue Mountains Forest Plan Revision FEIS notes in relation to riparian impacts from grazing:

“degraded stream channels may remain in relatively poor condition long after the original impact because changes in stream channel conditions may make these streams more susceptible to damage from subsequent floods, making it difficult to identify the principal cause of degradation. Maloney et al. (1999) reported elevated stream temperatures in intensively grazed watersheds in the John Day basin, and the lowest stream temperatures were observed in ungrazed watersheds, but results were confounded by 100 years of prior grazing history.”

Timber harvest, grazing, and the synergistic impacts of these activities 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)."

Logging can be associated with changes in macroinvertebrate community structure or metrics (Flaspohler et al. 2002, Kreutzweiser et al. 2005), increases in stream temperatures (Guenther et al. 2012) and alterations in nutrient cycling and leaf litter decomposition rates (Lecerf and Richardson 2010). Flaspohler et al. (2002) noted that changes to biota associated with selective logging were found decades after logging.

For example, the USFS's Draft Forest Plan Revision for the Blue Mountains (vol. 2 pg. 48) noted:

"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 evidence of deterioration showed up at different spatial scales within the watershed".

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). Both Erman et al., (1996) and Rhodes et al., (1994) concluded, based on review of available information, that intermittent and non-fish-bearing streams should receive stream buffers significantly larger than those afforded by PACFISH/ INFISH. Negative impacts to upstream reaches, such as higher temperatures, increased sediment loading, down-cutting, and altered hydrographs also negatively affect downstream reaches.

LOGGING OF LARGE TREES, INCLUDING WITHIN RHCAs:

It appears that the Baker City Watershed sale is proposing to log large trees within RHCAs. The DEA notes on pg. that *"Within RHCA units: Do not commercially remove large (>21 inch) early seral trees (ponderosa pine and western larch) from within the shade zone (within 100 feet of stream banks)."* This seems to suggest that logging of large trees may occur for all other species in the shade zone within 100 feet of stream banks, as well as outside of the shade zone, where logging is proposed within RHCAs. The DEA is not sufficiently transparent with this information, nor does the DEA adequately analyze the numerous and deleterious effects of logging large trees within RHCAs. How many large trees does the USFS estimate would be logged as part of the Baker City Watershed sale overall? How many large trees would be logged within RHCAs? What would be the change in approximate number of large trees per acre in both uplands and RHCAs?

The Forest Service should immediately abandon this project, including egregious plans to log large trees within this sale, including within RHCAs. Large trees are integral to a variety of crucial aquatic and

riparian ecosystem functions and processes. Large trees play central roles in these ecosystems, such as helping to store sediments and nutrients; shaping channel morphology and instream habitats and conditions necessary for fish and other aquatic organisms; supporting groundwater flows, hyporheic flows and groundwater storage (and so providing cold water flows into streams); and providing key habitat for numerous species. (Bisson et al. 1987; Bilby and Bisson 1998; Frissell et al. 2014; Hicks et al. 1991; Pollock and Beechie 2014; Ralph et al. 1994; Spies et al. 2013). Logging large trees is bad for watershed hydrology, streams, and aquatic life.

Should logging be implemented as proposed in the DEA, riparian habitats, water quality, and fish would be directly and negatively impacted by the Forest Service's failure to recognize the importance of large trees, and by the logging of these large trees. **Approximately 75% of eastside terrestrial species depend upon riparian habitats for their life cycle needs or use these habitats more than others (Henjum et al. 1994).** Riparian and aquatic ecosystems are heavily reliant on large tree structure (including large living trees, large trees with cavities, large snags, large downed wood, and large woody debris in streams). Aquatic ecosystem integrity is intertwined with mature and old forests—and includes large *and* old trees, not *just* old trees.

Notably, the original Eastside Screens EA included the protection of *large* and old trees as part its Purpose and Need. Large trees, and the wildlife habitat needs they provide, were explicitly included as part of the definition of what constitutes old and late seral structure. The Wildlife Standard in the original Screens EA states that *“the definition of 'remnant old and late seral and/or structural live trees' has been clarified by adding ">21 inch dbh" to better define what is meant.”* Also, *large* trees were central to the habitat needs of Late and Old Forest-Associated species in the original Screens EA. The Screens EA states that the “Habitat Needs of Late and Old Forest-Associated species” for northern goshawk, pileated, white-headed, and three-toed woodpeckers and the pine marten” were part of the significant issues considered in the analysis; these species were identified as management indicator species for late and old forest habitats. Each of these species depends on the habitat provided by large trees. The original Screens EA further highlights the importance of *large* tree structure by noting that *“Large* down woody debris (logs) provide habitat for numerous species”. The original Screens EA also emphasizes the need to protect “high levels of *large* snags” under the Wildlife Interim Standards. The agency's narrow focus on including only *old* forest structure without proper context fails to protect wildlife species that rely on large tree structure, which were both clear goals of the original Screens. Also, the 1990's Eastside Forests Ecosystem Health Assessment (EFEHA) team concluded that there was a “loss of large trees”, and that the team “developed the Eastside Screens in part to keep existing *large* and old trees and manage national forests to promote an increase in the number of *large* and old trees” (emphases ours). The agency's failure to wildlife habitat and old forest components (including large tree structure) produces myopic and incorrect assumptions and interpretations regarding large tree, wildlife habitats, and other ecosystem components in the current EA.

The Eastside Forests Scientific Society Panel was convened in 1993, not long after the order by President Clinton for the Forest Service to “develop a scientifically sound and ecosystem-based strategy for management of eastside forests.” The recommendations and science in *The Interim Protections for Late Successional Forests, Fisheries, and Watershed: National Forests East of the Cascade Crest, Oregon, and Washington* by Henjum et al. (1994) were a part of the science and developments that history that help inform the Eastside Screens. *The Interim Protections for Late Successional Forests, Fisheries, and Watershed: National Forests East of the Cascade Crest, Oregon, and Washington* by Henjum et al. 1994, included the following recommendation: **“Cut no trees of any species older than 150 years or with a diameter at breast height of 20 inches or greater”**. The report goes on to say that:

*“These mature trees have lived for decades, even centuries; their very existence demonstrates that they have the genetic characteristics to survive the full range of environmental variation present in eastern Oregon and Washington. Their complex structure, the product of a millennia of natural selection, offers unique niches for microbes, invertebrates, and vertebrates. They serve as reservoirs of genetic diversity and irreplaceable sources of seed for forest regeneration; **they renew the supply of large snags and fallen logs, which furnish nest and den sites for many animals; they provide nutrients to the soil;** and they stand as a unique historic record, an irreplaceable link between the past and the future. These trees are living examples of our long-term objectives” (emphases ours).*

Clearly, the authors recognized the importance of large trees of any species, including those that were ‘mature’ and ‘decades’ old. The authors highlighted the importance of ongoing future recruitment of large snags and logs, and the necessity of large wood structure and recruitment for providing ongoing sources of wildlife habitat. They highlight the need to protect large *and* old trees—it was not limited to only old trees—and reflected the need to protect processes and functions dependent on large trees well into the future.

Henjum et al. 1994 further discussed the key importance of large trees for wildlife species. For example (pg.176):

*“[T]he pileated woodpecker (*Dryocopus pileatus*) relies on large snags for roosting, nesting, and foraging sites. Loss of large trees eliminates habitat for this species. Because the woodpecker builds cavities that are in turn used by many other species, species besides the woodpecker can also disappear from a site when snags are removed.”*

The authors also discuss the importance of large trees for species such as bald eagles, Vaux’s swifts, and bears (pgs. 184, 185, and 188). Furthermore, the authors recognized the importance of large Grand fir in providing key wildlife habitat:

*“Pileated woodpeckers depend on large snags for nesting and roosting (Bull et al. 1992). Within eastside forests, pileated woodpeckers seem to be closely tied to old grand fir (*Abies grandis*) stands with trees in advanced decay caused by the Indian paint fungus (*Echinodontium tinctorium*) (Bull et al. 1992); Bull and Holthausen 1993), a keystone organism that softens core wood. The woodpeckers in turn provide other keystone services by excavating nesting and shelter cavities in infected core wood, and these are eventually used by many birds and mammals (Thomas et al. 1979a)” (pg. 185).*

Clearly, large Grand fir were recognized as important and as needing to be preserved in the literature and analyses that helped to form the Screens.

Henjum et al. 1994 highlights the importance of preserving large trees in relation to climate change--something that the Forest Service has generally failed to acknowledge some 26 years later: *“Loss of large trees alters patterns of gas exchange, especially for carbon dioxide, changing global climate patterns” (pg. 172).*

The deficit of large trees across the landscape due to past logging has been extensively well-documented, and as a result is a central focus for protection in the original Eastside Screens. The past and ongoing deficit of large trees has important implications for wildlife. Many species rely on large trees and snags habitat, particularly in riparian forests. Yet, the Baker City Watershed DEA fails to adequately

incorporate the importance of large trees, large snags, and large logs—or the complex processes necessary for creating and maintaining these components-- into its analyses or priorities for protection and restoration. The EA fails to acknowledge, for example, the key ecosystem functions of large Grand fir, and the need to protect large fir for wildlife habitat. The EA also fails to adequately protect or consider the importance of multistory forests for wildlife species and their habitat needs.

Bull et al. 1997 highlights the importance of large fir with cavities, as well as the importance and rarity of the multilayer stands that produce this habitat, notes:

“In northeastern Oregon, grand fir and western larch make up most of the hollow trees used by wildlife. Bull et al. 1997 goes on to note that “[l]arge, hollow trees are uncommon in managed landscapes and typically are found only in late- and old-seral stands of grand fir and western redcedar. Although isolated hollow trees in young stands have significant value to wildlife, these young stands cannot reproduce this type of structure for at least 150 to 200 years. The late-seral, multilayer stands that produce hollow trees comprise less than 3 percent of the forested landscape in the interior Columbia River basin.”

The Forest Service Region 6’s Response to Blue Mountains Biodiversity Project’s Freedom of Information Act request (2016-FS-R6-001106-F) included the “Eastside Screens Enclosure; Recent Science Findings and Practical Experience: Implications for the Eastside Screens September 2015”. This Enclosure also recognizes the importance and rarity of large hollow firs. The Enclosure noted (emphases added):

“Implementation of the Screens has substantial species management implications. For example, the white-headed woodpecker, Lewis’s woodpecker and several species of bats are Regional Forester’s Sensitive Species that rely on large snags and defective trees for part of their life history. Large, defective grand fir trees and snags provide critical roosting and denning habitat for black bears, Vaux’s swifts, pileated woodpeckers, American marten, and bats (Bull et al., 1997). These legacy trees, especially large, hollow grand fir, are rare on the landscape and have declined from historical conditions on the eastside of Oregon and Washington”. The enclosure also states: “These findings reinforce the importance of retaining and recruiting large, old trees in dry, mesic and moist mixed conifer forests on the eastside of the Region. It is critical that silvicultural prescriptions provide for large snags and defective trees in adequate numbers through time....large, hollow grand firs take 150 to 200 years to develop (Bull et al. 1997): adequate numbers of smaller trees need to be left to allow for the processes that create replacement hollow trees.”

The Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin and Portions of the Klamath and Great Basin (Quigley et al. 1996) includes summaries of their finding. The “Highlighted Findings” note that **there has been a 27 percent decline in multi-story old forest structures** (Chapter 8, Findings, pg. 181). Given the extensive portion of forests that have already been logged on the landscape, large trees and patches of mature and old forests (and the large trees, snags, and logs within them) often provide some of the last high-quality wildlife habitat and connectivity corridors in and adjacent to timber sale areas.

In recent years, numerous studies have raised alarms regarding habitat loss, climate change, and decline of fauna and biodiversity across the planet. Warnings have been sounded by scientists regarding the declining bird populations we are seeing, and the projections of far greater losses to come. For example, the Rosenberg et al. (2019) study *Decline of the North American Avifauna* reported a “staggering decline

of bird populations, and found “wide-spread population declines of birds over the past half-century, resulting in the cumulative loss of billions of breeding individuals across a wide range of species and habitats. They show that declines are not restricted to rare and threatened species—those once considered common and wide-spread are also diminished. These results have major implications for ecosystem integrity, the conservation of wildlife more broadly, and policies associated with the protection of birds and native ecosystems on which they depend.”

Given the urgent need to address the biodiversity and climate crises, which includes species and habitats in the Blue Mountains, the agency needs to focus on protecting wildlife, clean water, high-quality habitat, and ecosystem integrity. Birds are an integral part of forested ecosystems on the Blue Mountains, and were not adequately considered in the EA. For example, a number of bird species rely on forest types or structural components that would be significantly affected by the proposed changes to the 21” Screens. These structural components and forest types include: large trees, mixed-conifer forests, fir dominant or codominant forests, and mature and late old structure forests. While the EA explicitly encourages increased logging of large firs, the proposed changes would greatly increase logging of *all* species of large trees, not just fir. The EA did not adequately analyze or avoid the negative effects to birds that would occur under all action alternatives.

The following is a summary of birds in the Blue Mountains of Oregon and SE Washington that are likely to be affected by the FS’s proposed rollback of protections for large trees under the current 21” wildlife screens. For additional detail and citation information, please see the detailed notes and spreadsheet that compliments this section. These documents include additional detail about BBS population trends, Langham et al. (2015) climate threat determinations, and habitat descriptions from Csuti et al (1997), Thomas et al. (1979), Miller (personal communication), and Marshall et al. (2006).

Birds that rely on large trees: The EA fails to consider many at-risk species that may be negatively affected by the loss of large trees across the landscape, should the Forest Service’s proposal to increase the logging of large trees be implemented. Bird species in the Blue Mountains that rely on large trees for a key portion of their life cycle (such as reproduction) include Bufflehead; Barrow’s goldeneye; Common merganser; Hooded merganser; Wood duck; Red crossbill; White crossbill; Brown creeper; Vaux’s swift; American three-toed woodpecker; Black-backed woodpecker; Lewis’ woodpecker; Pileated woodpecker; Williamson’s sapsucker; Boreal owl; Flammulated owl; Great grey owl; Long-eared owl; Western screech owl; Northern saw-whet owl; Bald eagles; Golden eagles; and Osprey. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications).

Documented population declines & birds that rely on large trees: According to the Breeding Bird Survey (BBS), several of these birds that rely on large trees (listed above) are also facing declining populations across the Northern Rockies, the Great Basin Ecoregions, and/or Oregon or Washington state. Some of these also face declining populations across their entire survey range and the US. Birds that rely on large trees and also facing declining populations include: Bufflehead; Barrow’s goldeneye; Common merganser; Wood duck; Vaux’s swift; Lewis’ woodpecker; Williamson’s sapsucker; and Western screech owl.

Association with mature and old forests, mixed-conifer forests, and fir dominant or co-dominant forests & birds that rely on large trees: Many of the birds that rely on large trees are associated with mature forests, old growth forests, mixed-conifer forests, and/or Grand fir or Doug fir during a key portion of their life history. These include: Bufflehead; Barrow’s goldeneye; Hooded merganser; Wood duck; Red crossbill; Brown creeper; Vaux’s swift; Pileated woodpecker; American three-toed woodpecker; Black-backed woodpecker; Lewis’ woodpecker; Williamson’s sapsucker; Great grey owl;

Boreal owl; Long-eared owl; Flammulated owl; Northern saw-whet owl; Bald eagles; Golden eagles; and Osprey. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications). All of these have either seen declining populations according to the BBS, and/or are considered climate endangered or climate threatened by Langham et al. (2015).

Birds that rely on large trees and are at risk from climate change: Climate change will affect bird populations, habitat availability, and ranges. In order to ensure the viability of native birds including waterfowl, raptors, neotropical songbirds and other migratory birds, the Forest Service must consider how climate change will impact these birds and the cumulative impacts with increased logging in mixed-conifer and mature and old growth forests.

Langham et al. 2015 *Conservation Status of North American Birds in the Face of Future Climate Change* identified 314 birds at risk of losing more than half of their current geographic ranges under climate change scenarios. In addition, 126 of these are not expected to see gains in their geographic ranges. The authors note: “*Our results demonstrate the need to include climate sensitivity into current conservation planning and to develop adaptive management strategies that accommodate shrinking and shifting geographic ranges. The persistence of many North American birds will depend on their ability to colonize climatically suitable areas outside of current ranges and management actions that target climate adaptation.*” The authors also note: “*We suggest that the 126 species in this category be considered by conservation entities for immediate monitoring beyond existing programs such as BBS and CBC.*”

Birds that rely on large trees (noted above) and are also considered climate threatened or climate endangered by Langham et al. (2015) include: Bufflehead; Barrow’s goldeneye; Common merganser; Hooded merganser; Wood duck; Red Crossbill; White-winged crossbill; Brown creeper; Vaux’s swift; American three-toed woodpecker; Black-backed woodpecker; Lewis’ woodpecker; Williamson’s sapsucker; Boreal owl; Great grey owl; Long-eared owl; Western screech owl; Northern saw-whet owl; Bald eagles; Golden eagles; Osprey.

Birds that rely on mixed-conifer forests, mature and old forests, and Grand fir: Birds that rely on mixed-conifer forests, mature and old forests, and Grand fir will be negatively affected by increased logging within these forest types. Logging within these forests may result in loss of key forest components such as multi-story canopies, shrubs, understory structure, unfragmented forests, needed cavities in trees and snags, snags, and logs. Logging of large trees, as well as increased size and intensity of logging projects, would result in forests becoming more younger, more homogenous and even aged, open, and drier. The FS’s proposed increases in large tree logging, and the resulting increase in intensity and amount of logging area, would have significant impacts on tree species composition and forest density across the landscape. As a direct result, available habitat, connectivity, and ranges (especially when climate change is considered) would be affected across the landscape by the FS’s proposed changes.

Birds that rely on mixed-conifer forests, mature and old forests, and Grand fir for at least part of their life histories (such as reproduction and feeding) include: Harlequin duck; Red crossbill; White-winged crossbill; Brown creeper; Vaux’s swift; Evening grosbeak; Pine grosbeak; Hermit thrush; Swainson’s thrush; Varied thrush; Pine siskin; Cordilleran flycatcher; Golden-crowned kinglet; Ruby-crowned kinglet; Black-capped chickadee; Chestnut-backed chickadee; Mountain chickadee; MacGillivray’s warbler; Townsend’s warbler; Yellow-rumped warbler; Mountain bluebird; Calliope hummingbird; Rufous hummingbird; Red-breasted nuthatch; American three-toed woodpecker; Black-backed woodpecker; Downy woodpecker, Hairy woodpecker, Lewis’ woodpecker; Pileated woodpecker,

Williamson's sapsucker; American kestrel, Winter Wren, Western Tanager, Hammond's flycatcher, Boreal owl; Flammulated owl; Great grey owl; Long-eared owl; Northern saw-whet owl; Northern pygmy owl, Bald eagle; Golden eagle; Osprey; Merlin, Peregrine falcon, and Northern goshawk. (Marshall et al. 2003; Csuti et al. 1997; Thomas 1979; Miller 2020 personal communications).

In addition, most of the birds listed above are also facing current population declines in part of all of their range within the Blue Mountains (according to the BBS) or are considered climate threatened or climate endangered (Langham et al. 2015). The habitat requirements of birds imperiled by declining populations and/or climate change should have been considered and analyzed in the EA. The Forest Service cannot protect the viability of these species without analyzing the effects of this proposal on their habitats, ranges, connectivity, and needed forest components and structures.

Thomas (1979) also highlights several wildlife species that rely on large trees and mixed-conifer, mature and old forests, and Grand fir. Examples include:

Wildlife species that rely on large trees: The EA fails to consider many at-risk species that may be negatively affected by the loss of large trees across the landscape, should the Forest Service's proposal to increase the logging of large trees be implemented. Wildlife species in the Blue Mountains that rely on large trees for a key portion of their life cycle (such as reproduction). For example, Pacific fishers, Spotted skunks, and American marten rely on large trees with cavities for reproduction.

Wildlife species that rely on mixed-conifer forests, mature and old forests, and Grand fir: Wildlife species that rely on mixed-conifer forests, mature and old forests, and Grand fir, will be negatively affected by increased logging within these forest types. Increased logging within these forests, which the Forest Service is targeting, may result in loss of key forest components which these species rely upon. The Forest Service's proposed increases in large tree logging, and the resulting increase in intensity and amount of logging area, would have significant impacts available habitat, connectivity, and ranges (especially when climate change is considered). Examples of wildlife species that rely on mixed-conifer forests, mature and old forests, and Grand fir for at least part of their life histories (such as reproduction and feeding) include: Canada lynx, bobcat, Snowshoe hare, White-tailed deer, Northern flying squirrel, numerous bats, Rubber boa, Malheur shrew, Vagrant shrew, Dusky shrew, Heather vole, Long-tailed vole, Gapper red-backed vole, Black bear, Short-tailed weasel, Jumping mouse, and mule deer.

Because forests within RHCAs have been somewhat more protected in the last few decades, these forests often have comparatively more large trees and mature and large forests compared to upland forests. As a result, they are providing even greater and disproportionately important wildlife habitat to fauna that rely on large trees. Unfortunately, these riparian forests have become increasingly targeted for logging in recent years. Given the paucity of surrounding mid-to-large trees in the uplands, logging in RHCAs threatens the remaining crucial wildlife habitat in these areas. Proposed logging of large trees would have far-reaching and damaging impacts to large trees structure, large trees with cavities, snags, downed logs, and large woody debris for streams both within the project area and in cumulative impacts to the region. In addition, the Forest Service's narrow focus on the logging of large trees ignores mycorrhizal networks, sharing resources among trees; windthrow; or other situations in which nearby trees and tree cohorts benefit each other and promote biodiversity.

Logging large trees in mixed-conifer forests within and adjacent to riparian corridors will negatively impact wildlife. For example, Northern goshawk and other accipiter hawks, American marten, Great gray owls, Black-backed woodpeckers, Three-toed woodpeckers, Pileated woodpeckers, Olive-sided flycatchers, and other species that rely on denser forests, mature or old growth mixed conifer forests, and/or will be negatively affected by logging in riparian corridors.

DellaSala et al. 2022 also highlight the importance of preserving large trees and mature and old forests:

“Federal forests in the Eastern region are maturing from logging that eliminated all but a fraction (1–2%) of the oldgrowth forests over a century ago (Davis, 1996). Most mature forest types in this region lack protections, many are not on federal lands, and most are fragmented especially given that large IRAs are mostly in western regions. Additionally, the USDA Forest Service (2022) revised its 20-year forest management plans for the 416,000 ha Nantahala and Pisgah National Forest in western North Carolina claiming that they needed to log mature forests to create a diversity of seral stages even though classic old-growth forests are still well below historical levels (Davis, 1996). A combination of federal protections, improved forestry practices, and conservation incentives on non-federal lands are needed in this region to meet conservation targets for MOG.

Under the Trump administration, the USDA Forest Service removed protections for large diameter (>50 cm dbh, up to 150 years old) trees on national forests in eastern Oregon and Washington that were in place for over two decades, even though large trees remain below historical levels (Mildrexler et al., 2020). We recommend restoring those protections. The five state western proposal that includes the Northern Rockies Ecosystem Protection Act also contains nearly 11 M ha of MOG with only 20% in GAP1 and 2 status and another 30% in IRAs (GAP2.5). Recent policy and management decisions underscore the importance of increasing MOG protections in this region as well.”

The primary threats and stressors to special-status and at-risk riparian and aquatic species on National Forests in eastern Oregon are logging, roads, and livestock grazing. These activities result in increased fine sediment inputs to streams, warming stream temperature, increased diurnal stream temperature fluctuations, stream bank instability, soil compaction and erosion, fish passage barriers, and other widespread problems.

Proposed logging will have negative and long-term impacts on water quality, watershed hydrology, channel morphology, fish, and aquatic species. These and related potential impacts were not adequately analyzed or avoided in the DEA. The DEA has little or no analysis of the potential impacts to these parameters due to logging (such as increased erosion and sediment potentially caused by changes to peak flow timing and magnitude). The Forest Service also did not adequately analyze or avoid negative effects due to logging on hyporheic zones, groundwater function, or stream downcutting. The EA's insistence on logging to address forest health is not in line with the actual impacts, threats, and stressors to listed and at-risk riparian and aquatic species, and will instead exacerbate these issues.

The Baker City Watershed project area provides unique and important habitat for species such as Northern goshawks, Great grey owls, Flammulated owls, Black-backed woodpeckers, Three-toed woodpeckers, Williamson's sapsucker, primary cavity excavators, osprey, mountain lions, black bear, elk, deer, wolverine, lynx, American marten, bats, Johnson's hairstreak butterfly, gray wolves, amphibians, sensitive plants, and numerous other species, including ESA-listed and Survey and Manage species. Many of the species within the Baker City Watershed project area rely on the complex canopy structure, denser forests with more closed canopies, mature and old multi-story structure provided within these forests. The mature and old mixed-conifer forests within the project area are providing some of the best remaining habitat for many species in this area, particularly within RHCAs.

We are very concerned about the logging of large trees and the associated loss of key habitat for wildlife including the widespread loss of snags and of large downed wood recruitment for logs and in streams. Large trees, downed wood, and legacy snags are important components of these mature and older complex mixed-conifer forests. For example, legacy snags and snag habitats such as the ‘stove pipe’ snags (large hollow snags) are preferred habitat for Great grey owls, and are also crucial for species such as bears and Vaux’s swifts. Should this sale move forward, what is the agency’s estimate for the number of large trees that would be logged, felled as “hazards”, or cut down in relation to roads or haul or transport corridors?

Riparian corridors provide particularly important habitat that is used at disproportionately high rates by many species of wildlife. The negative ecological impacts associated with logging in mature and old mixed-conifer forests, multi-story and complex habitat, and the logging of large trees are particularly concerning in relation to riparian forests and the streams they protect. Streams and riparian forests are impacted by what occurs in the uplands as well as within riparian corridors, and can be affected by actions in neighboring creeks and waterbodies. We are concerned about the effects to streams and riparian corridors from upland logging and roading, in addition to being very concerned about such activities within RHCAs.

In addition, crucial wildlife habitat such as snags and downed wood are vitally important, particularly in RHCAs as they see disproportionately high wildlife use and serve as connectivity corridors. Unfortunately, the FS increasingly sees this key wildlife habitat as “fuels” and logs such habitat or destroys it as part of the collateral damage of logging. In addition, managed stands have fewer snags than unmanaged stands (Cline 1997).

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 RHCAs. The 2017 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 Watershed Report (pg. 36) notes that: “Objectives are designed to retain the largest and healthiest trees within the stand with an emphasis on retaining trees from the older age classes.” However, it is large trees, regardless of age or species of the tree, that are required by most wildlife. Further, trees with mistletoe or heart rot, or other native diseases and unusual growth patterns are often the most beneficial to wildlife and provide the most opportunity for nesting or other uses.

In addition, we are concerned that the combined effects of logging and prescribed fire can also be severe for sapling recruitment. In addition, logging down to very low basal areas, followed by prescribed burning, may end up with severely open canopies-- especially if burns run larger or hotter than intended. Opening up forest canopies to a low basal area can cause forests to be substantially drier and hotter, and cause habitat loss for species that rely on multi-layered and dense canopies. Shrubs may extensively colonize such open areas, making it difficult for forests to recover from logging. Also missing from the FS's cumulative effects analyses are the past and possibly ongoing/future effects from fire lines, backburns, and other fire suppression efforts. We are also extremely concerned about the potential severe impacts associated with logging within fire lines and ember reduction zones, and the lack of adequate analyses surrounding these activities.

Van Pelt Guideline:

The Baker City Watershed DEA states: "Trees of 150 years of age and greater would be identified by characteristics, as defined in Van Pelt (Van Pelt, 2008). The typical characteristics of old trees are a combination of visual indicators including limb, crown, and bark characteristics. All commercial harvest prescriptions would be designed to retain old trees to move stands toward old growth characteristics."

However, the Van Pelt guidelines do not include guidelines for aging Grand fir. The Forest Service does not have a reliable or objective method for aging Grand fir, and so does not have any way to ensure that old Grand fir (150 years or older) will not be felled/logged as a part of the Baker City Watershed sale.

It is disingenuous for the Forest Service to continually refer to trees 80-149 years old as 'young'. These trees were previously considered to be 'mature', which is an important distinction for as these trees have often begun to develop mature and old characteristics important for wildlife species.

POTENTIAL VIOLATIONS OF THE NATIONAL FOREST MANAGEMENT ACT, PACFISH/INFISH, RIPARIAN MANAGEMENT OBJECTIVES, AND/OR CLEAN WATER ACT:

Logging large trees will increase surface runoff and overland flow, which delivers warmer water and excess sediments into streams quickly, and can alter 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 and Hairsine 2006; Jones and Grant 1996). 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 and Coffin 1992). Should proposed logging be implemented, it would create more open canopies, which will then increase solar radiation inputs, 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; Harr and Coffin 1992). 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. 1992; Chen et al. 1995; Brosnoff et al. 1999)

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; Groom 2011; Groom 2011; Jones and 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.

Given the research done by Ebersole and others cited above, it is very likely that logging within RHCA's, including the agency's proposals for no setback for small and intermittent streams and violations of PACFISH/INFISH requirements, and is likely to threaten the cold water temperatures and refugia in streams that are important for Bull trout and other aquatic species.

The Eastside Screens riparian standard include the following (emphases ours): **“Timber sales (green and salvage) will not be planned or located within riparian areas as described below:**

- a. **Perennial and intermittent fish-bearing streams:** consists of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or **300 feet slope distance (600 feet including both sides of the stream channel}**, whichever is greatest.
- b. **Perennial nonfish-bearing streams:** consists of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the out edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or **150 feet slope distance (300 feet, including both sides of the stream channel}**, whichever is greatest.
- c. **Intermittent non-fish bearing streams:** consists of the stream channel from the edges of the stream channel to the top of the inner gorge, or to the outer edges of the riparian vegetation, or to the extent of landslides or landslide-prone area, or to a distance of **100 feet slope distance (200 feet, including both sides of the channel), whichever is greatest.**

In violation of the above standards, the Baker City Watershed sale EA proposes only **a 75-foot zone was established for fish bearing stream reaches (category 1 RHCA), a 25-foot zone was established for perennial streams (category 2 RHCA) and no setback zone for intermittent streams (category 4 RHCA).**

The Watershed Report pg. 42: “The proposed action calls for three different buffers surrounding the three different stream categories. These criteria were developed as BMPs to minimize shade losses and potential water temperature increases while restoring low severity wildfire process in zones that lead to overly dense forests that are within roadless areas and provide high quality water to downstream municipalities. **A 75-foot zone was established for fish bearing stream reaches (category 1 RHCA), a 25-foot zone was established for perennial streams (category 2 RHCA) and there is not a setback zone for intermittent streams (category 4 RHCA).**

The Watershed Report continues: “Nine commercial units occur over intermittent streams and the commercial activities would not be buffered. Shade would be reduced on these sites likely by 10-15 units because they are drier sites and may not have as much shrub cover due to limited moisture. Forest Plan shade standards apply to live streams that have been interpreted as perennial, therefore they don't apply to these units. Thirteen commercial units occur adjacent to fish bearing streams and the commercial

activities were buffered at least 75 feet (some of these units are set back 120-300 feet) back from the stream.”

The Aquatics Report gives additional detail: “Under Alternative 2, approximately 1.3 acres in Blue SW, 4.7 acres in Elk SW, 46.4 acres in Lake SW, 3.0 acres in Settlers SW and **12.4 acres in Salmon SW would have ground-based equipment within the 50 foot sediment delivery zone of waterbodies. Commercial RHCA treatments would have mechanical equipment with tethered and traditional whole tree yarding logging equipment, skid trails and landings. Fish bearing RHCAs would have a 75 foot setback for commercial thinning, perennial RHCAs would have a 25 foot buffer and intermittent streams would occur overlapping the stream channel.**”

The Forest Service cannot credibly claim that there will be no significant impact to streams, water quality, stream temperature, fine sediment delivery, large woody debris, or other RMOs, as a result of proposed logging and roading within RHCAs.

Other very concerning activities that are not in line with PACFISH/INFISH buffers:

- Logging of large trees can occur within RHCAs
- Tethered logging will apparently be allowed within and/or adjacent to RHCAs: “tethered units, equipment travel down-draw through ephemeral draw would be avoided.”
- The Aquatics report also notes that logging “will be dictated by the topography and slopes less than 30% will be traditional ground based and greater than 30% slope will be implemented with either a skyline or tethered logging system.”
- Skid trails will be used within RHCAs—with the stipulation that an average of 100’ be maintained between them.
- Forwarder roads will be allowed within RHCAs—with the stipulation that an average of 60’ be maintained between them.
- Skidding of material within RHCAs will be allowed
- Ground based logging equipment will be allowed within RHCAs, up to 50’ away from streams. Logging equipment may be allowed within 50’ with approval.
- Landings will be allowed within RHCAs, up to as close as 50’ to streams
- Prescribed fire would not be ignited within 25 feet of streams but would be allowed in RHCAs.

Even as the FS is planning to ignore PACFISH/INFISH buffers and other standards, streams within the project area are already not currently meeting RMOs. Proposed logging and roading will further retard attainment of those RMOs. The DEA notes that California Gulch, and Salmon Creek reach one are not meeting LWD objectives. The Aquatics Specialist Report notes that “Fish habitat in the project area generally does not meet INFISH RMOs for pool frequency, LWD, and width to depth ratio (Table 5). Fish habitat in the project area generally does meet the Forest Plan Standards for temperature, fine sediment and riparian shading (Table 5. Existing condition from most recent Pacific Northwest Region (R6) Level II Stream Surveys for five primary habitat elements. Table 7. Water Temperature Conditions with standards and year of collection by subwatershed and Table 8. Percent stream shade by subwatershed). The impaired condition of important habitat elements including low pool frequency, reduced LWD frequency, indicate reduced aquatic habitat quality due to past management activities.”

Furthermore, the Aquatics Report acknowledges that planned logging within the RHCAs, including along fish bearing streams, includes shade reductions that are expected to persist for approximately 10 years, as well as noncommercial logging within inner RHCAs. Logging as outlined within the Baker City Watershed DEA is not in line with the buffers put in place by the Eastside Screens and

PACFISH/INFISH, and is likely to increase stream temperatures and fine sediments, and negatively impact stream structure, hydrology, and water quality.

The PACFISH Standards and Guidelines state that activities within the RHCA “should not to prevent attainment of Riparian Management Objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could perpetuate or be damaging to long-term ecosystem function, listed anadromous fish, or designated critical habitat.”

According to the Aquatics Specialist Report, streams are already not meeting RMOs for several parameters, including LWD. Logging is planned adjacent to streams, despite not currently meeting RMOs, and will further retard attainment of RMOs by removal of riparian shade, logging of large trees (and so removing of current large wood and future large wood recruitment), as well as increased stream temperature and fine sediments (especially given the rollback of RHCA buffers as defined in PACFISH/INFISH).

Logging within RHCAs has well-documented and negative effects on stream temperatures, including increased water temperatures. For example, 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.

Small streams are particularly vulnerable to increases in 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. Logging within RHCAs, removing shade, road-related impacts, and degrading hyporheic flow can increase stream temperatures in small intermittent 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 and Nelson 1994; DeWalle 2010; Kiffney et al. 2003; Groom et al. 2011 201; Jones et al. 2006; Sweeney 2013; Pollock et al. 2009; Wigington et al. 2006; Poole et al. 2008; Poole and Berman 2001; Ebersole et al. 2015).

Also, logging within RHCAs or forest wetlands can magnify water quality and hydrology impacts from upland logging. (Hicks et al. 1991; Moore and 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.(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. The authors found that in streams with wetlands present in their catchments tended to have streams with finer sediments in their substrates.

Even in situations where logging within RHCAs is limited to thinning of smaller diameter trees, logging may compromise the ability of the RHCA 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. Logging of large trees within RHCAs will substantially exacerbate these negative effects.

PACFISH/INFISH no-cut stream buffers should be adhered to and fully implemented. No commercial logging should occur with RHCAs, and noncommercial logging should be dropped or severely scaled back. Logging within RHCAs will retard the attainment of RMOs, including quantitative standards such as stream temperature, fine sediment, pool depth, embeddedness, LWD, and other RMOs. Does the FS have more complete/additional baseline data for RMOs within the project area? If so, the agency should include this information as part of an Environmental Impact Statement analysis for the project.

Overwhelming evidence shows that logging has negative effects on streams, water quality, and watershed hydrology. This is especially true for logging within riparian corridors, but is also true in regard to upland logging, particularly when large tree logging, logging on steep slopes and sensitive soils, and road-related activities are proposed. The Forest Service consistently fails to adequately consider the well-documented risks of logging and associated activities (such as road-related activities) on water quality, streams, and watershed hydrology.

In addition to some of the negative effects described above, logging is likely to increase surface runoff and overland flow, potentially delivering warmer water (and excess sediments) into streams more quickly and with a greater volume. As discussed in other sections of these comments, such inputs can also cause erosion and alter stream morphology. Such issues can, in turn, affect stream temperatures.

The Forest Service has ignored decades of scientific consensus, research, and expert opinion regarding riparian buffers, including their own. For example, the FS noted that: “[r]esearch has shown that effective vegetated filter strips need to be at least 200 to 300 feet wide to effectively capture sediment mobilizing by overland flow from outside the riparian management area” (Draft Blue Mountains Forest Plan Revision vol. 2 pg. 52). The FS is clearly not adhering to the requirements or the intent of PACFISH/INFISH in the Baker City Project.

In addition, biodiversity in headwater systems can be significant, but is not well characterized and may be underestimated (Pearl et al. 2009). We are concerned that biodiversity will be severely negatively impacted by the FS’s non-compliance with PACFISH/INFISH buffers. For example, amphibians such as the Columbia spotted frogs and tailed frogs, would benefit from the 300’ buffers or larger protective riparian buffers. Stream-associated amphibians require clear, cold water (Corn & Bury 1989, Cushman 2006, Olson & Weaver 2007, Pearl et al. 2009, Semlisch & Bodie 2003, Welsch and Olliver 1998). Corn and Bury (1989) found that amphibian diversity decreased in lower order streams adjacent to logging. Semlisch and Bodie (2003) found that riparian-associated amphibians utilized and depended upon large areas of upland terrestrial habitat (approximately 300 meters for most amphibians), and so require core habitats well beyond the traditional buffers afforded to the headwater riparian areas (Semlisch and Bodie 2003, Olson et al. 2007). Cushman (2006) suggested management strategies include headwater areas and/or patches that are prioritized for core habitats and maintain connectivity between some watershed areas (Cushman 2006). In general, amphibians in headwater areas may not receive sufficient protections in relation to land management projects (Corn & Bury 1989, Janisch et al. 2011, Semlisch & Bodie 2003). The FS is unfortunately going in the opposite direction, and attempting to decrease or altogether eliminate (such as in small streams) the already buffer protections under Forest Plan standards.

The FS is largely relying on the 2000 Olson master’s thesis and the Harley 2020 paper for the agency’s rationale for extensive and heavy logging within RHCAs because, supposedly, the “outer portion” of

RHCAs on fish bearing and perennial streams is essentially the same as upslope regions. Apparently, it also gives the agency license for logging right over small intermittent streams, without no-cut buffers, with the same rationale.

Aquatics Report: “Research from the Blue Mountains has shown that riparian areas in small headwater streams burned with similar frequency as the uplands ranging from 13- 14 years in ponderosa forest (Olson, 2000). A study from the Baker City Watershed Project area by Harley et al (2020) also found that the fire return intervals between the upland and riparian areas were similar from 1650-1900.”

Watershed Report: Most of the project area (63 percent) was dominated by high frequency and low severity fires that occurred every 10 to 25 years (Harley et al, 2020).”

However, we are extremely concerned about the agency’s reliance on a small number of studies—two studies, one of which is an unpublished master’s thesis—to ignore long-held and widely agreed upon scientific consensus regarding the importance of riparian buffers, such as the no-cut buffers required under PACFISH/INFISH. The master’s thesis and the paper both have small sample sizes, particularly with regard to north/northeast facing slopes and streams. We are also very concerned that crucial details are being overlooked or ignored by the FS concerning these studies. In addition, the FS has ignored ample and well-documented evidence regarding the negative impacts logging and associated activities have on RMOs such as stream temperatures, fine sediments, LWD, pool frequency, and others, as well as peak and base flows, watershed hydrology, and other parameters.

For example, the Harley 2020 study shows sample sites that are predominantly on south or west facing slopes. The Baker study area plots have a total of 35 upland sites. 20 of those appear to be on primarily on south-facing slopes. Of the 15 sites that have more of a northern or eastern slope orientation, 5 appear to also include strong southern or western influences, as they are somewhat northwest or southeast facing. Of the 35 upslope sites in the Baker study area, only 10 appear to be clearly on slopes that have a strong north, northeast, or east orientation.

In the Dugout study area, there appear to be a total of approximately 75 upland sites. Only 12 of those sites appear to be on slopes with strong and predominant north, northeastern, or eastern facing. Of these, four of which are on ridgetops.

Riparian sites are almost entirely situated all on the larger order streams within the study area, which tend to be less incised and more open. Only 8 sites were situated on smaller tributaries, and only one of these sites faces N/NE.

Figure from the Harley paper:

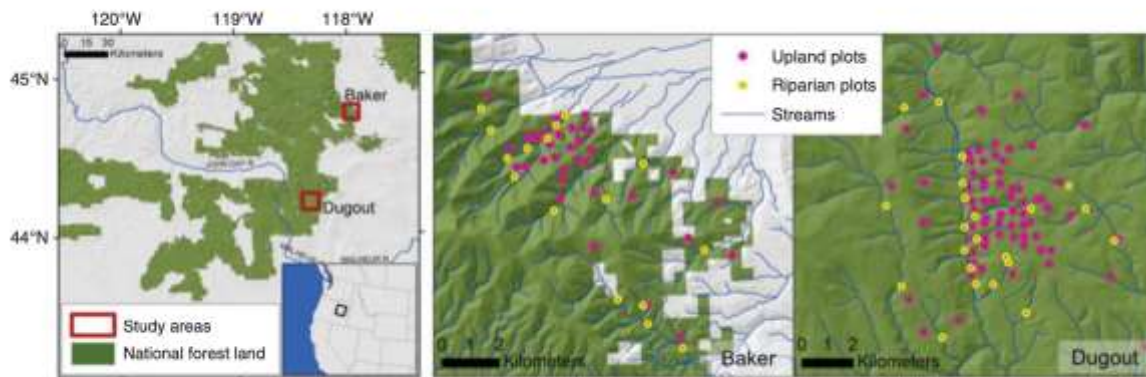


Fig. 1. Location of Baker and Dugout study areas and riparian and upland plots in the Blue Mountains of eastern Oregon, USA. Most of the riparian plots were sampled for this study and most of the upland plots were sampled for an existing study (Heyerdahl *et al.* 2001).

The Haley paper also notes that “[i]n the two study sites in the Blue Mountains of eastern Oregon during the period 1650–1900, **historical fires burned more frequently in upland forests compared with adjacent, downslope riparian forests.**” However, the difference between riparian and upland fire intervals at both Baker (5 years) and Dugout (3 years) was not statistically significant ($P = 0.10$) and likely not ecologically relevant.

The lack of statistical significance can be due to a variety of factors, including small sample size. In this instance, the sample size for sites representing north/northeast facing sites was an even smaller proportion of an already small sample size, and seems to have constituted far less than half of the sample sites. While statistically significant differences were not found between upland and riparian forests, there was a clear trend pointing to a difference between the two-- even with the small data set in this one scientific study. Given the paucity of information being used to rationalize extensive logging within RHCAs, the FS has a responsibility to, at the very least, take into account data trends and the more detailed and fine-scale results within these two studies. The authors in the Haley *et al.* study go on to dismiss any ecological significance, but do not provide any evidence or rationale for this dismissal.

The Olson 2000 study notes that sample size may well have played a role in not finding statistically significant differences in relation to aspect:

“When fire return intervals were separated according to aspect, no significant differences in fire return interval lengths were found between aspects. When riparian and upslope fire return intervals were compared within each aspect, the only significant difference was that west-facing riparian fire return intervals were longer and had a wider confidence interval than west-facing upslope fire return intervals. It is very likely that the results of aspect analyses suffer from a small sample size. Perhaps with a larger sample size more significant differences would have been found between the different aspects, since it appears there may be a trend of decreasing fire return interval lengths from west-facing plots to east-facing plots to north-facing plots (Figure 19). Additionally, riparian fire return intervals appear to be somewhat longer than upslope fire return intervals for each of these three aspects, and the difference between the riparian and upslope fire return intervals may be decreasing from west-facing plots to east-

facing plots to north-facing plots. There are too few fire return intervals from south-facing plots to comment on where they fall within the trend.”

Other excerpts from Olson’s 2000 master’s research showing important details that were not captured in FS characterizations:

*“When both riparian and upslope plots within only the Marble Creek drainage were analyzed, only the riparian fire return intervals from the **north-facing halves of the riparian plots stood out as being different than the other aspect categories** (Figure 15). They were significantly longer than their upslope counterparts (26 year and 15 year WMPIs, respectively, $p = 0.01$, two-tailed Mann-Whitney U-Test for unmatched samples) and **were also significantly longer than fire return intervals from the southfacing halves of the riparian plots** (15 year WMPI, $p = 0.01$, two-tailed Mann-Whitney UTest for unmatched samples).”*

*“More fires burned into the south aspects of the riparian plots than fires that burned into the north aspects of the riparian plots, and this is true for all fire extent size classes. **This may indicate that fires on southfacing slopes tended to back down into the riparian zone and then stop along the creek, whereas either fewer fires occurred on north-facing slopes, or they were less likely to back down into the riparian zone.**”*

“Stream Size Comparisons. Fire return interval lengths in riparian forests are slightly longer but not statistically different from fire return interval lengths in upslope forests, and this is consistent for plots along both large and small streams.”

The study analysis appears to include very small isolated fires in determining fire return intervals. For example, very small fires that burn only a few trees (for example after a possible lighting strike) seem to be included in determining watershed-scale fire return intervals.

In review of these maps, we note that there were substantial portions of the Baker City Watershed project area that had no evidence of any fire, including the headwaters/upper watersheds of Mill, Marble, and Salmon Creeks. This suggests that there are areas currently targeted for logging, including logging within RHCAs, that have longer fire return intervals and have been acting as fire refugia for centuries. Such forests provide important habitat for species that rely on mature and old forests, and dense and complex canopy forests. These forests also provide cold clean water.

Several locations that did show repeated fire along the mid and lower portions of Mill and Marble creeks appeared to have very isolated and small-scale fire activity, possibly suggesting not only extremely small fires such as those related to lighting strikes that burn less than one acre—they also suggest that those locations are attracting repeated fire strikes at the same ridge tops or topographically high point.

Olson 2000 mapped fire years for “every year there was clear evidence of fire scarring” (Appendix E. pp. 181- 237) showing 1428 through 1972. We want to note some finer scale detail from those maps that we observed:

For the Mill, Marble, and Salmon watersheds:

- There appears to be no evidence of fire scars shown on the maps for the upper portions of these. Also there looks to be little to no logging in at least a portion of these areas, meaning these mature and old forests have been acting as fire refugia since at least 1428.
- The maps also show no evidence of fire for these more incised, steep watersheds between 1428-1529 (~100 years).
- Between 1529 and 1645, there are only isolated incidents of evidence of fire scars at single sites in these watersheds, with the exception of 1581 when there was a second location that had “probable” fire evidence. So, between 1428 and 1646 there was no evidence of more than one isolated small fire until 1646 for the three watersheds (~218 years), with the exception of the “probable” other single location.
- Mill Creek had only isolated evidence of fire scars at single sites, with two exceptions, one with 2 sites showing evidence and the other with five (in 1783 and the other in 1828, respectively). So, aside from single isolated locations showing evidence of fire scarring within Mill Creek, there was no evidence of fire in Mill Creek between 1428 and 1782 (352 years); between 1784 and 1827 (43 years); or between 1829 and 1972 (143 years).

In addition, fire scar analyses have limitations (as does all ecological study methodology). We are concerned that some of the potentially important implications of the limitations with fire scar analyses are being ignored by the FS—with potentially very unfortunate and negative ramifications for forests. For example, we are concerned that the fire scar analyses may be artificially inflating the frequency of fire regimes because small localized fires are overrepresented and/or conflated with fire return intervals (rather than recognized as often very localized, sometimes tiny events). For example, an isolated lightning strike that burns a handful of trees, sometimes repeatedly on the same ridge in different years, does not a fire return interval make.

Use of composite fire intervals tend to shorten the time between fires and give a false interpretation of the past fire history. For example, personal communications from George Wuerthner, in our communication regarding limitations of fire scar analyses used in research with similar methodology, include:

“Take a hypothetical situation: Let's say you have a 1000 acre study area. You note a fire someplace in that 1000 acres every single year over a hundred year period. However, for argument's sake, each of those fires burns less than a single acre. So you have a total of 100 fires and a fire interval of 1 year. I.e. the fire scar history suggests there is a fire every year. But because each fire is less than an acre, you have only burned 100 acres in a hundred years or only 10% of the 1000 acre study site. Even at a fire every year, it would require 1000 years to get to the fire rotation.

This is why it's important to note how large the fire is. You can do this in a number of ways including using air photos, fire atlas, or Government Land Office survey notes as Baker has done.

Using fire scars, the best way to do this is to only include fires that burn a significant amount of the study area. In other words, again using the 1000 acres. You would ignore all the fires that are only recorded at one or even a few sights and assume they are small fires of no consequence. After all we are trying to get to the notion of how important fire was in any area and the kind of fire that burned. The only fires you would include would be the years when the majority of the study sites burned, preferably across much of the 1000 acres. You could also

note the occurrence of even-aged stands across large areas that might indicate regrowth after a stand replacement blaze. That would give you the real fire rotation.”

Similarly, personal communications from William Baker, in our communication regarding limitations of fire scar analyses used in research with similar methodology (and so are also relevant here), include:

“There are no estimates of historical fire rotations, the essential rate parameter of historical fires. Composite fire interval estimates are done within each site, not across sites, which is OK. But, there is little correction to remove small fires, so their MFRI is close to a mean CFI-all fires in the Baker (2017) terminology. Using Baker (2017 Table 2), to estimate fire rotation, for mean CFI-all fires, we would multiply MFRI by 2.44. For the range of MFRI in their Table 1, which is 10.6-21.2 years, the estimated range of historical fire rotations would then be 25.9 to 51.7 years.

Based on these fire rotations, these were not frequent-fire forests with fire rotations < 25 years that would have kept fuel loads generally reduced, since fuels can recover within about 10-20 years usually. Instead, historically there would have been ample time for fuels to fully recover between fires, including plenty of fully regrown shrubs, many small trees, lots of small wood, some larger wood etc. and some stands with higher tree density. It is important to estimate fire rotations because it is well accepted now in the scientific fire community that the MFRI used in Johnston et al. does not estimate historical rates of burning and should not be used to guide restoration programs (Baker 2017). See the quotes in this paper from well fire historians that make this very clear:

Also, in the intro Johnston et al. suggest fire regimes would have been mixed severity, but then they did no reconstruction of fire severity, which of course is essential where fires were historically mixed in severity. The paper doesn't say so explicitly, but seems to assume that all fires were low-severity, and the final paragraphs even imply that higher-severity fires did not occur. Of course, what would be expected is that in moister forests, more of the fires that occurred would be higher-severity, including substantial patches of high-severity fire, whereas in ponderosa of course more of the fires would have been low-severity, with fewer that were higher-severity, as has been shown nearly everywhere that fire severities have been reconstructed in these kinds of forests. Showing, as they do, that MFRI did not differ between dry and moist forests has little meaning, since it is not the occurrence of fires, but instead fire size and fire severity that would be expected to differ. They have no data on the essential fire-severity parameter of historical fire regimes in ponderosa pine and mixed-conifer forests in their study areas, and certainly cannot conclude that historical fire regimes would have been similar in these two types of forest.

Also, their historical basal area estimates are based on just extant (live) historical trees, not dead trees present on the forest floor. Although fires may have been suppressed, there are many other sources of continuing tree mortality that could have killed and even removed many of the smaller trees present in the late-1800s (e.g., bark beetles, drought, competition, root rots etc.). They did not compare their basal area estimates to early historical reports, such as Munger 1917 to see whether extant live historical trees even approximately estimate basal area, tree density, and tree diameter distributions in the late-1800s to early 1900s. It is well known that smaller trees present in the late-1800s would likely have burned, died from competition or other mortality agents, and decomposed since then, particularly in moister forests. Since logging is often aimed at smaller trees, and they have no validation at all that smaller trees are

correctly reconstructed by using just extant live trees that happen to still be present, this study does not provide a sufficiently sound basis for any restoration logging program.”

Baker and Ehle (2001) provide a more indepth discussion of terminology and methodology regarding fire scar analyses; we’ve including a copy of this paper as part of our comments on the Baker City Watershed DEA.

Large woody debris (LWD):

We are very concerned that logging, particularly logging of large trees (especially within RHCAs) will negatively affect the availability of large wood and future large wood recruitment for LWD in streams. Large wood recruitment and delivery is a crucial cornerstone of ecological integrity for streams, essential for the viability of many native and ESA-listed aquatic species, and a driving force of recovery for stream morphology. Hyporheic flows and groundwater storage and movement depend in part on large wood and future large wood recruitment, and are important for maintaining cold water in perennial streams. Groundwater movement and storage is interconnected with a number of complex watershed processes and forest components.

Aquatic ecosystems include complex and interdependent interactions. The loss of large woody debris in streams negatively affects stream morphology, including pools. The reduction of LWD and smaller wood for streams, as well as future recruitment for these components, is already occurring through logging in many timber sales across the landscape. Logging of large trees will greatly exacerbate this issue, negatively affect aquatic ecosystems, and potentially violate RMOs under PACFISH/INFISH.

It is important to highlight that small intermittent streams, as well as perennial streams, would also be negatively affected by the loss of large wood, and that those effects are felt downstream. Loss of large wood in small intermittent streams will negatively impact recruitment of large wood in downstream reaches. This, in turn, will negatively impact instream habitats and water quality for aquatic species including imperiled salmon and trout. Loss of large wood in intermittent streams in small catchments will result in less large wood in perennial streams, and thus result in fewer large pools and habitat complexity. Large wood is very important for protecting underground water storage and movement of small intermittent streams. Small streams are crucial to maintaining cold water for downstream perennial waterways, and to creating and ensuring cold water refugia for fish. (Benda et al. 2005; Caissie 2006; Kaufmann and Faustin 2011)

Stream temperature data and monitoring:

Baker City Watershed Report notes that: “Elk Creek and its watershed are the only waterbody listed as being 303(d) water quality impaired (DEQ, 2022) in the project.”

However, the DEA notes that numerous streams within the project area are not meeting water quality standards. Normally, such violations would lead to these streams being listed on ODEQ’s 303d list. Has the Forest Service shared stream temperature data for creeks within the project area?

Given that streams are violating stream temperature standards within the Baker City Watershed sale project area, it is not at all clear that the FS shared those data showing temperature exceedances with ODEQ. According to the DEA, 13 out of 22 stream monitoring sites (just over half of monitoring sites) are meeting ODEQ temperature criteria in the project area. “Based on recent stream temperature monitoring, most of the streams (13 of 22 sites) are meeting the DEQ temperature criteria throughout

the project area (see Table 10).....The uppermost site in California Gulch did not meet water temperature standards. Lower reaches of Marble, Little Marble, Salmon, Little Salmon, and some of the sites in the middle sections of Elk Creek exceeded temperature standards (see Table 10). Of these sites, Little Marble, Marble, Salmon, Little Salmon were very close to the water temperature standard, within one degree of the 7DADM. Little Mill had a 7DADM that exceeded the standard by 1.4 °C, California Gulch's headwaters exceeded by 4.7°C and Elk exceeded by 4.3°C.” The DEA also notes that “California Gulch would likely have heightened water temperatures because of past mining and impacts associated with the lack of proper reclamation. Exceedances that were observed in 2020 in Little Mill, Marble, Little Marble, Salmon and Little Salmon Creeks may continue to have exceedances in years with low snowpack and early season increases on air temperature. Stream temperatures in the upper reaches of Mill, Marble, Salmon, Little Salmon, Elk, Blue Canyon and sections of California Gulch would continue to meet the water quality conditions defined by DEQ.”

When streams are impaired and, as a consequence, including on the 303d list-- actions are then required to ensure that they do not raise stream temperatures by more than 0.1 degree Celsius. However, if the FS has not shared stream temperature data with ODEQ then the USFS is improperly sidestepping such requirements, and sidestepping key regulatory oversight as well as the creation of TMDLs and restoration plans to bring streams back into compliance with CWA standards.

We are also worried about the impacts from logging, roading, and associated activities on stream habitats, water quality, and watershed hydrology downstream of the project area, including further downstream in the Powder River—which is already in violation of numerous water quality standards.

We are concerned that the Forest Service has repeatedly and systematically failed to share water quality data with ODEQ. Until BMBP wrote letters to Forest Supervisors and ODEQ staff calling attention to this issue in 2018, the National Forests in eastern Oregon had not shared the vast majority of their water quality data with ODEQ for over a decade. After we highlighted this issue during the last ODEQ ‘call for data’ in 2018, the Forest Service shared large amounts of data with ODEQ, finally. However, based on stream temperature data that BMBP received through FOIA, the Forest Service still has not provided ODEQ with existing stream temperature data for some streams, including streams in violation of water quality standards. Did the Forest Service share all of their stream temperature data for streams within the project area with ODEQ?

The Forest Service has a legal responsibility to uphold state water quality standards on the federal lands they manage. Their directives include adhering to ‘adaptive management’ practices. We are very concerned that the USFS is not upholding water quality standards and not adequately tracking or sharing the results of their water quality monitoring with the public or ODEQ, and that they have failed to create a framework for adaptive management. For example, the Forest Service lacks data or evidence showing that recent logging activity and current logging proposals will not adversely affect or further degrade water quality, including in streams that are already in violation of state water quality standards for temperature or sediment. The USFS, despite our persistent inquiries, has not been able to provide us with examples of or data from any upstream/downstream and before/after monitoring from logging projects in priority watersheds, including logging projects taking place within Riparian Habitat Conservation Areas. It seems that there *may* have been one or two projects that might have had such a targeted monitoring design, but the USFS has not been able to provide us with a location, name of stream, or any data. None of the dozens of USFS staff or specialists I’ve talked with have been able to say for sure if such monitoring has taken place, or tell me a location or stream where it will take place in the near future. The USFS does conduct subwatershed and watershed scale water temperature monitoring—these

monitoring data often reflect high stream temperatures that are in violation of state water quality standards. The necessary follow-up work to figure out what is causing these widespread water quality issues and violations is lacking.

Monitoring and accurate inclusion of water quality data into Oregon's Integrated Database are key components for ensuring that water quality standards are being upheld, and for protecting the viability of aquatic species, including ESA-listed species. Given the widespread logging on public lands across eastern Oregon, including the increasingly common practices of commercial and non-commercial logging within streamside RHCAs, inclusion of accurate water quality data in ODEQ's Integrated database is key for examining and assessing landscape scale data and for implementing adaptive management strategies.

In addition, we are concerned that the USFS is increasingly attempting to use streamside shade as a proxy for attainment of stream temperature standards. However, one has only to look briefly at NEPA documents to understand that data on the percent of shade in a streamside corridor is a poor substitution for water temperature data. For example, in the Aquatics Report of the Camp Lick timber sale on the Malheur National Forest, 25 out of the 31 stream reaches that the USFS surveyed for shade met fish habitat objectives. Yet, only 6 out of 25 of the reaches with stream temperature data met the USFS's fish habitat objectives in those streams (Camp Lick Aquatics Report pages 17-19). Clearly, using stream shade as a proxy for stream temperature in these eastside forests is not appropriate. While we understand that stream shade is an important driver of water temperatures, it is not the only one. Many factors influence stream temperatures, as we've discussed and provided scientific references for in numerous portions of these comments.

The DEA does not give clear data summaries of the USFS's available data, nor how it was collected. For example, are there additional water temperature data from recent years? Do they reflect higher temperatures than the years that were included for public review? Were stream data temperatures collected with HOBO data probes, and include continuous readings, or were they grab samples? If they were grab samples, were they taken in the morning? (Grab samples were, for example, including in the Camp Lick Aquatics Report on the Malheur NF, while other higher temperatures with continuous data were only discovered through BMBP's FOIA request. The agency called the comparison BMBP made between the two data sets "apples and oranges", in stunning disregard for standard and best protocols regarding data collection).

The most common water quality impairment in National Forest System lands is stream temperature. Elevated stream temperatures are known to negatively impact fish stocks on National Forest lands in the Blue Mountains, including anadromous fish, and listed and at-risk fish such as Bull trout. Water quality standards for temperature, sediment, and other water quality parameters are not being met on hundreds of miles of streams on these National Forest lands. TMDLs and WQRPs have not been developed in a timely fashion for many 303(d) listed basins. BMPs have not been adequately re-evaluated or adjusted to assure compliance with water quality parameters such as temperature. WQRPs plans and TMDLs often do not adequately deal with forest management activities, and monitoring is not always followed through on and lacks public transparency.

More than 1,240 stream miles on National Forest lands in the Blue Mountains are listed as not meeting water quality criteria. The most common water quality impairment on National Forest lands is stream temperature (Draft EIS for the Blue Mountains Forest Plan Revision (BMFPR), Vol. 1 pg. 272). This baseline figure from the BMFPR is almost certainly an underestimate-- the large volume of recent data submissions in 2019 from the Forest Service to ODEQ reflect even more widespread problems with

stream temperature violations across the landscape. The recent data submission was the first effort by the Forest Service to share a substantial portion of their data with ODEQ in over a decade.

Increased logging of large trees in upland and riparian forests would cause additional increases in stream temperatures across the landscape. High stream temperatures are already a limiting factor for at-risk and special status aquatic species in many areas. Threatened fish stocks are struggling due to high stream temperatures and increased fine sediments. Stream temperature increases, especially in areas that are already in violation of state and Forest Plan stream temperature standards, are especially dangerous to ESA-listed Threatened Bull trout and steelhead populations. Even localized increases at the subwatershed or reach scale can jeopardize already ESA-listed fish—especially if the problem is repeated in multiple stream reaches across the landscape. At-risk aquatic species such as Bull trout are already suffering from fragmented and small populations. Creating additional negative impacts across the landscape as a result of increased logging large trees is extremely risky at best. Small and isolated populations make for fragile populations (that are subject to declines due to localized events, genetic drift, and other factors). Reiman et al. (2001) noted that: “...*vulnerable aquatic species could be impacted in the short term in ways from which they could not easily recover...*” even in cases where the management actions resulted in long-term benefits in later years. The negative effects on water quality parameters such as stream temperature from proposed logging within this sale and from ongoing logging throughout the region are already putting Bull trout and Steelhead at risk. The increased stream temperatures that would result from the proposed logging and roading in this EA would exacerbate the already dire situation for water quality and imperiled aquatic species across eastside Forests.

Watershed hydrology:

The Watershed Report notes that proposed log haul would take place on 105 miles of Forest roads across the project area as a result of alternative 2. In total, there would be haul on 1.8 miles within the Blue SW, 1.1 miles within the Elk SW, 4.3 miles within the Lake SW, 1.4 miles within the Settlers SW, and 6.1 miles within the Salmon SW RHCA's (see Table 15). **Sediment delivery from the 90 miles of log haul routes that are located outside the RHCA would not have an effect on stream sediment as the roads are outside the RHCA and have no mechanism for sediment delivery.”**

There is no evidence to suggest, as the FS claims, that only roads within RHCAs can influence sediment delivery. For example, it is well-established that, especially in watersheds with high road densities, road networks act as artificial stream channels, greatly increasing the magnitude and timing of peak flows and potentially carrying sediment into streams. Transport can occur through a variety of mechanisms, including roadside ditches, culverts, erosion, and gullies. Small and large landslides increase in frequency in association with roads, providing another mechanism by which fine sediments can be carried into streams—even if these roads and events occur outside of RHCAs.

Excess fine sediments generated by road related erosion or harvest 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 can reach streams (Croke and Hairsine 2006, Nietch et al. 2005, Wemple et al. 2000). 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 (Croke and Hairsine 2006, Wemple et al. 2000). 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 (Croke and Hairsine 2006, 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 and Wondzell 2005, Wood and Armitage 1997).

Existing conditions for RHCAs and forest roads in the project area are noted to be currently stable, in part, because of the absence of ground-disturbing activities within RHCAs. This will, of course, drastically change should logging, roading, skidding, and other associated logging activities be implemented in RHCAs. In addition, the Watershed Report notes a host of road and past mining related issues, many of which are already delivering fine sediments into streams and affecting water quality and watershed hydrology. We are also concerned such issues have been underestimated. In addition, are there concrete plans with guaranteed funding for addressing current problems with past mining and roads? Given the issues and risks described by the Watershed Report, increased roading and ground-related activities associated with logging as described in the DEA will exacerbate these and similar issues and have significant negative effects on streams, water quality, and watershed hydrology.

From Watershed Report pg. 26-27:

*“RHCA conditions across the project area were relatively stable and well vegetated with ground cover, **primarily due to the absence of ground-disturbing activities within RHCAs** (see Soil Reports). **The exception to sediment delivery in RHCAs is relevant for forest roads.** Past mining areas in Marble Creek had runoff flowpaths that connected spoil piles to Marble Creek and the Project Hydrologist and Fish Biologist had observed similar sized and textured rocks in spoil piles were also being deposited in pools. Salmon Creek had historical mining with rock check dams causing impoundments and altered hydrology in fine sediment deposition patterns. California Gulch, Elk Creek and other unnamed tributaries (southern portion of project area) have had historical mining without proper reclamation that is also likely impacting fine sediment transport processes.*

*Road condition surveys were completed on most of the road network in the project area and **various segments of roads have accelerated surface runoff or are at increased risk of delivering sediment in the future due to inadequate maintenance and proximity to streams.** Roads that are located within an RHCA are considered to have the highest risk for sediment delivery to streams. These roads were prioritized for site visits and development of site-specific BMP recommendations.*

Of the 70 sites that were documented for road maintenance needs:

- 21 sites (30%) recommended re-establishing lead off ditches to minimize segments of road from connecting accelerated runoff, turbidity and fine sediment delivery to streams. Figure 7 and Figure 9 below are an example.*
- 5 sites (7%) recommended maintaining important ditch relief culverts or ditches that were causing water quality problems or potential blockages.*
- 6 sites (9%) that had culverts that were broken or nonfunctional and impeding conveyance of water or stormwater runoff. Figure 8 below is an example.*
- Multiple fords were observed in Elk Creek and one in Salmon Creek that could be a conduit for fine sediment delivery at road/stream connections. Figure 9 below is an example.*
- Marble Creek road had a variety of potential water quality issues observed during data*

collection. A runoff path originated on the 6510045 and continued down the 6510 road and created a gulley down the hillslope and deposited road sediment on the Marble Creek's floodplain. Marble Creek was also diverted around the historic mine and snowmelt runoff flows down the inboard before reconnecting with Marble Creek. Private lands are intermixed with this segment.

Overall, the documented occurrence of hydrologic issues indicate that all of the subwatersheds are at high risk for sediment delivery from roads. These locations for hydrologic issues were estimated to be at approximately 10% of total road sites. Many of the roads in the project area were in good condition and were representative of Figure 6."

We also note that over ½ of the 70 sites that were documented for road maintenance needs have been identified as **roads that have accelerated surface runoff or are at increased risk of delivering sediment in the future due to inadequate maintenance and proximity to streams**. This includes streams that are already exceeding Forest Plan standards for fine sediments, including Marble Creek and Salmon Creek, as shown in Table 11 from the Watershed Report:

Table 11. Channel substrate data for surveyed reaches

Stream Name	Subwatershed	Percent fine sediment (<2millimeters)
Marble Creek Reach 1	Salmon SWS	25%
Marble Creek Reach 2	Salmon SWS	31%
Mill Creek Reach 1	Salmon SWS	7%
Mill Creek Tributary Reach 1	Salmon SWS	8%
Salmon Creek Reach 1	Salmon SWS	21%
Salmon Creek Reach 3	Salmon SWS	22%

We are also extremely concerned that the DEA and Watershed Report downplay or ignore likely negative impacts on streams, water quality, and watershed hydrology that are well-documented to be associated with roads and logging. For example, the Tiger-Mill Scoping Notice of Proposed Action admits:

"Depending on the nature, extent and timing of disturbances, changes 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 hillslope erosion transported into streams, as well as increased streambank and streambed scour."

From the Upper Touchet Hydrology Report:

"The relationship between created openings in forested landscapes and changes in water yield and peak flows has been documented by numerous studies. Changes in forested stand and canopy density caused by harvest, fire, or insect and disease can change the distribution of the snow pack, increase the rate of melt of the snow pack, and cause the timing of the melt to be earlier. These factors may lead to changes in peakflows. In addition, reduction of stocking density reduces the overall vegetative use of water, increasing the amount of water available for runoff. Changes in water yield and in peak flows have the potential to destabilize channels, causing increased erosion and sedimentation in channels. Changes in these parameters would be of concern for aquatic habitat and biota, downstream water users, and for channel morphology."

The Mill Creek DEA:

“Equivalent Harvest Area (EHA) Water yield is particularly affected by changes in the water budget, which includes changes to precipitation, evaporation, and transpiration from vegetation, infiltration, and runoff. Changes in water yield can influence bank erosion, stream temperatures, stream form, and habitat for fish. Resulting channel incision can reduce connection to floodplains and therefore reduce potential water retention across a valley section. EHA is an assessment required by the Ochoco National Forest Land and Resource Management Plan (Forest Plan) to determine the effects to peak flow from timber harvest activities and forest vegetative Mill Creek Dry Forest Restoration, Watershed and Fisheries Effects Analysis 3 conditions within a watershed. EHA is based on the principle that removing vegetation changes hydrologic response characteristics such as runoff, overland flow, peak flow, snow accumulation, timing, and total water yield. Excessive changes in these hydrologic response characteristics can lead to poor riparian conditions such as erosion, lateral scour, channel degradation, aggradation and/or incision resulting in poor water quality.”

Studies have found selective logging may be associated with increases of instream fine sediments (Kreutzweiser et al. 2005, Miserendino and Masi 2010). Upslope logging, particularly on steep slopes above streams, can increase fine sediment inputs into streams, contribute to stream temperature increases, cause increased variability in water quality and aquatic habitat parameters, and alter stream morphology and watershed hydrology. Additionally, logging on thin soils, ash soils, and rain-on-snow zones greatly increase the risk of soil damage, erosion, and excess fine sediments in streams. Zhang et al (2009) found long-term impacts to macroinvertebrate communities and streambed substrates. These impacts lasted for up to 40 years due to excess fine sediments associated with logging. Effects, such as changes to sediment loading and stream morphology, may not show up for many years after logging. (Beechie 2001; Beechie et al. 2005; Benda and Dunne 1997; Kelsey 1982; Madej and Ozaki 1996).

Ashy soils typically hold more moisture than sandy or poor soils. As a result, they are often associated with mixed-conifer forests. Because the EA encourages logging of large firs, mixed-conifer forests on ashy soils are likely to be targeted for logging, and would be at risk of soil damage, compaction, and displacement, should this proposal be implemented. In a recent Forest Service timber sale, the Upper Touchet FEA (pg. 47) notes 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).” The Upper Touchet FEA 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. The FEA also notes that “[a]sh cap soils cover about 80 percent of all the units in the project area”.*

The agency has, in practice, been shrinking the size of protective RHCA buffers across the landscape. In addition, headwater streams do not have adequate buffers to protect them from the logging already occurring on the landscape. Increased logging of large trees would further exacerbate these issues and degrade water quality and riparian and aquatic habitats. Should this proposal be implemented, the increased logging of large trees and the road-related activities associated with logging, will result in increases in excess fine sediments and turbidity in streams, and harm special-status and imperiled aquatic species such as Bull trout and Mid-Columbia River steelhead.

Nutrients

As logging is increasingly occurring within stream buffers, the agency has, in practice, been shrinking the size of protective RHCA buffers across the landscape. Headwater streams and small intermittent streams do not have buffer widths that are sufficient to protect water quality and stream habitats. Wider buffers are needed in order to prevent excess fine sediments and nutrients entering waterways. (Freeman et al. 2007; Gomi et al. 2005; Nieber et al. 2011; Sweeney and Newbold 2014).

Many special-status, at-risk and imperiled aquatic species rely on clean, cold water to survive. Proposed logging would degrade water quality, and instream and riparian habitats. Widespread problems with excessively high stream temperatures, excess fine sediments, and turbidity will be greatly exacerbated by increased large tree logging and the associated road-related activities.

The DEA's determinations that there would be no adverse impacts to water quality and streams rests in part on BMPs being properly applied. BMPs are largely subjective and voluntary, and it cannot be assumed that they will be implemented to their fullest possible extent. The protective measures intended by BMPs may or may not be applied in most situations, and lack any strong mechanism of enforcement. There is no guarantee or enforcement mechanism to ensure that they will be properly applied.

The FEA fails to adequately analyze and avoid impacts to water quality and stream habitats from issues such as past logging and potential indirect, direct, and cumulative impacts from the Baker City Watershed sale. These impacts are likely to be significant and to pose risks to water quality and aquatic habitats. Such direct, indirect, and cumulative impacts are likely to retard attainment of RMOs, including pool depth and width to depth ratios, and alter hydrology and stream morphology-- which in turn can result in negative impacts to stream temperature, bank stability, and streambed erosion. The DEA fails to take the requisite 'hard look' at the indirect, direct, or cumulative effects of logging on stream water quality, hydrologic processes, or stream morphology.

MONITORING AND BASELINE INFORMATION:

The Forest Service has repeatedly demonstrated that it does not have the ability to collect, organize, store, analyze, or share data and monitoring information in an effective or consistent manner. The following are a few examples of issues with monitoring data and information:

- The Forest Service lacks the will or internal organization to share data with outside agencies, such as Oregon Department of Environmental Quality, on a regular basis. Until BMBP wrote letters to Forest Supervisors and ODEQ staff calling attention to this issue, the USFS had not shared the vast majority of their water quality data with ODEQ for over a decade. After we highlighted this issue during the last ODEQ 'call for data' in 2018, the Forest Service shared large amounts of data with ODEQ, finally. However, based on stream temperature data that BMBP received through FOIA, the Forest Service still has not provided ODEQ with existing stream temperature data for some streams, including streams in violation of water quality standards. BMBP had to appeal the first FOIA response we received from the Forest Service in order to finally get the bulk of these data.
- Unwilling to be transparent with the public. The Forest Service has repeatedly made it difficult to obtain water quality information.
- Unable to properly organize data storage or coordinate data sharing among key staff members. For example, water temperature data does not generally seem to be housed in a central location in most instances. Submission of existing data into the centralized database is voluntary for staff

members in charge of such data. Once it became clear that the Forest Service was planning to (finally) submit some of their data to ODEQ during the ODEQ ‘call for data’, it became clear that the Forest Service did not have an adequate internal system or protocol for data storage or organization. Much of this data was housed with individuals who were not required submit it to the centralized database for eventual submission to ODEQ.

- The Forest Service often does not have accurate or consistent water quality data in NEPA documents. We have documented this issue for numerous streams. For a few examples, please see our exhibit with our letter to the Malheur National Forest requesting an SEIS for the Camp Lick timber sale.
- The Forest Service does not conduct an adequate or statistically robust number of site visits to determine BMP and PDC effectiveness in timber sales. This only happens for a handful (or less) of timber sale sites on each forest per year. While the Forest Service claims that BMP monitoring is effective, in reality the agency does not have enough data to make this determination.
- The Forest Service is unable to follow through with monitoring plans and efforts (for example, stream temperature monitoring promises made and broken)
- The Forest Service sometimes uses very limited monitoring data in an inappropriate fashion. For example, the agency will sometimes collect a small number of tree cores without any sort of standardized protocols or sampling design, not do appropriate analyses on the data, and then use the data to justify log large trees in timber sales (even when the diameter limits in the sales don’t correspond to the data collected).
- The agency lacks an appropriate framework for adaptive management. In many cases, the agency lacks baseline data, which is a key component of an adaptive management framework.
- When designing monitoring goals, the agency will often narrowly focus on monitoring parameters relative to ‘fuels’, silvicultural questions, tree species composition, or some other aspect of measuring trees or wood. The Forest Service rarely focuses substantial or widespread effort to systematically or responsibly collect data on and monitor issues such as: water quality response to logging in a before/after upstream/downstream design; wildlife or fish response to logging or grazing; soil compaction; etc.
- Lack of follow-through with long-term monitoring plans and promises, such as those for stream temperature monitoring in the Big Mosquito sale in the Malheur NF.

Based on these and other issues with current monitoring, there is no reason to believe that the Forest Service is able to conduct an adequate or comprehensive monitoring program in relation to the logging of large trees. Furthermore, the monitoring that the Forest Service is narrowly focused on parameters that miss the mark for actually looking for indicators of ecosystem response, or potential effects to wildlife, birds, water quality, riparian habitats, in stream habitats, etc.

SPECIAL-STATUS AND AT-RISK FISH AND AQUATIC SPECIES:

The DEA effects determinations for Bull trout and Bull trout critical habitat are “*Not Likely to Adversely Affect*” and *No Effect*. The *Aquatics Report* notes that “*Bull trout occupy approximately 2.18 miles of habitat within the project area, which represents approximately 0.3 percent of available habitat on the Wallowa Whitman National Forest.*”

What is the cumulative impact with other past, current, and foreseeable sales and other management activities across the Wallowa-Whitman National Forest? Across the Blue Mountains? While this project may affect a small percent of available Bull trout habitat across the Forest, what is the sum of all the recent, current, and reasonably foreseeable projects across the Forest? The Forest Service is ignoring the cumulative impacts of this combined with other projects on Bull trout habitat across the Forest. The agency is disingenuously using an improper scale of analysis, and then not bothering to even look at the actual cumulative impacts within that scale.

The Aquatics Report noted that consultation is planned to be completed before the signed decision. Will the public have a chance to review the consultation and comment on it during the objection period?

We also note that for some streams, such as Mill Creek, a lack of sufficient baseline data exist. The Aquatics Report note: *“The population size of bull trout within the Mill Creek tributary is unknown as evidence of their presence has only been made through eDNA and no individuals have been observed.”*

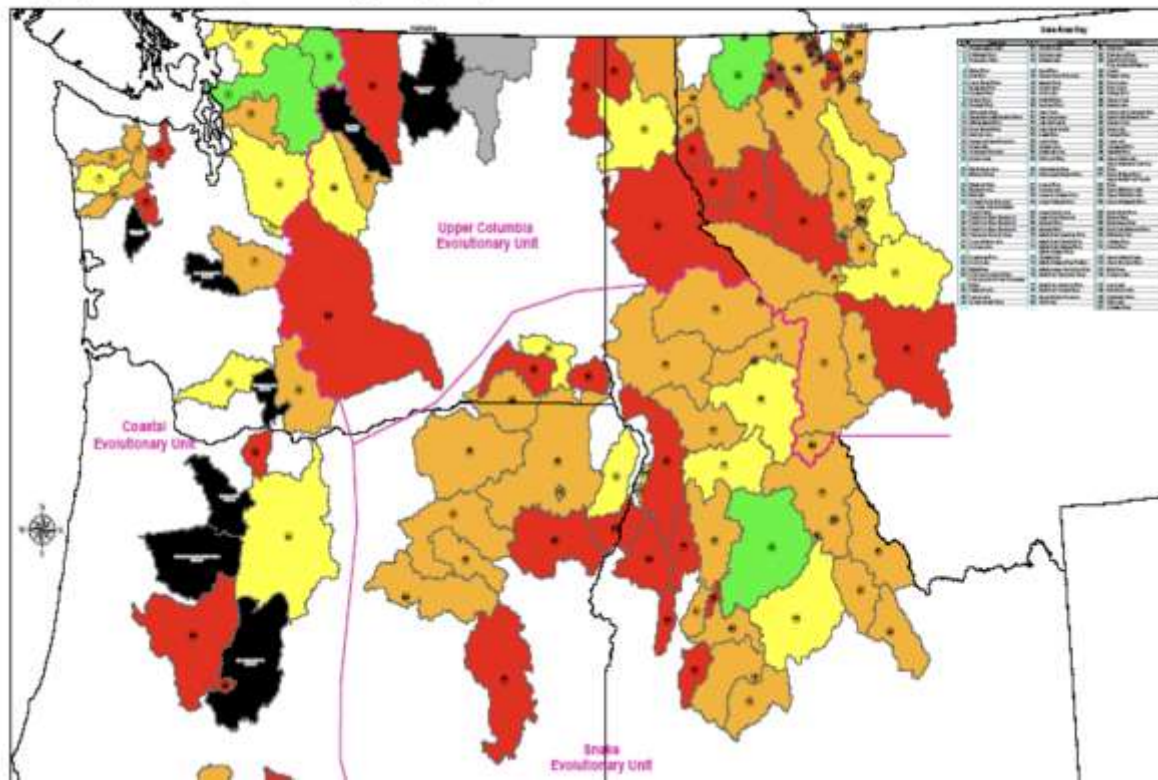
Should this proposal be implemented, logging and road-related activities are likely to increase stream temperatures and fine sediments, alter diurnal temperature patterns, and negatively affect RMOs and key stream habitats for Bull trout including LWD, pool depth and frequency, shade, and others. We are also concerned proposed logging and roading will alter watershed hydrology, such as the magnitude and timing of peak flows. We are very concerned that the Baker City Watershed sale will cause downward population trends for Bull trout, and threaten their continued.

We are also worried about the impacts from logging, roading, and associated activities on habitat for sensitive aquatic species downstream of the project area, including further downstream in the Powder River—which is already in violation of numerous water quality standards.

Bull trout populations within the Baker City Watershed project are characterized as at high risk (see figure below). Even in areas with comparatively high numbers, current population numbers are still low when compared to historic norms and to numbers needed for successful recovery. The USFWS 2010 Bull Trout Final Rule notes that “Over 30 years of research into wildlife population sizes required for long-term viability (avoiding extinction) suggests that a minimum number of 5,000 individuals (rather than 50 or 500) may be needed in light of rapidly changing environmental conditions, such as accelerated climate change (Traill *et al.* 2009, p. 3).”

Figure below from the USFWS 2008 Bull Trout 5-yr Review: Summary and Evaluation:

Figure 5. Map of Core Areas by Risk Category (red=high risk; orange=at risk; yellow=potential risk; green=low risk; gray=unknown risk; black=likely extirpated).



The effects determination for Redband trout is “May Impact Individuals or Habitat”. The Aquatics Report states: “Redband trout are present in all fish bearing streams in the aquatic project area (Figure 2), however their population abundance is unknown. Spawning and rearing habitat for redband trout is present in all fish- bearing streams in the project area. Redband trout occupy approximately 26.1 miles of habitat within the project area, which represents approximately 1 percent of available habitat on the Wallowa Whitman National Forest.”

What is the cumulative impact with other past, current, and foreseeable sales and other management activities across the Wallowa-Whitman National Forest? Across the Blue Mountains? While this project may affect a small percent of available Redband habitat across the Forest, what is the sum of all the recent, current, and reasonably foreseeable projects across the Forest? The Forest Service is ignoring the cumulative impacts of this combined with other projects on Redband habitat across the Forest. The agency is disingenuously using an improper scale of analysis, and then not bothering to even look at the actual cumulative impacts within that scale.

We are concerned that logging within RHCA's and logging of large trees as proposed in the DEA will negatively affect sensitive, at-risk, special-status, and imperiled riparian and aquatic species and their habitats, including Bull trout and Redband trout. We are also concerned about other at-risk, special-status aquatic species within the project area. We are concerned that special-status aquatic species may be present but unrecognized as occurring within the project area, and thereby be affected by logging and associated activities within the project area. Were survey protocols with targeted, habitat-specific surveys conducted for species such as the Western Ridge Mussel, Columbia pebblesnail, and *Taylorconcha insperata*, and other species that are present in the WWNF that may occur within the project area?

The EA does not contain any mechanisms to ensure that proposed logging within RHCAs and logging of large trees will not cause long-term detrimental effects to or loss of viability of at-risk and ESA-listed species. Logging is known to cause adverse impacts to water quality and riparian habitats, which in turn can harm sensitive, special-status, and at-risk fish and aquatic species, as discussed throughout the aquatics section of this document.

The Forest Service manages much of the land that encompasses core and critical habitats for spawning and rearing for numerous listed fish species. Spawning and rearing habitat quality is a limiting factor in the continued viability of these species, due in part to the widespread problems with high stream temperatures and excess fine sediments across National Forests in eastern Oregon (Middle Fork IMW Working Group 2017).

Logging may pose a greater risk to aquatic species than wildfire, even high-severity wildfire. For example, the USFS proposed Forest Plan Revision (2014) vol 2. pg 60 notes that Redband trout will recolonize a stream relatively rapidly after experiencing severe fire:

“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”.

In addition, the Olson 2000 thesis noted: *“Gresswell (1999) notes that local extirpation of fishes is often patchy in the case of extensive high severity fires, and that recolonization is rapid.”*

The agency regularly overstates fire risk, while ignoring or severely downplaying risks from logging. Increased logging of large trees in uplands and logging in riparian corridors pose clear and serious risks to imperiled and at-risk aquatic and riparian species.

Dynamics between stream temperatures and sensitive aquatic species may be far more complex, and often more delicate, than agencies are taking into account—including for ESA-listed species. The study *Key findings for Stream Temperature Variability: Why It Matters To Salmon* by Steele and Beckman (2014) found that:

“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”.

Also, evidence suggests that current BMPs and/or Project Design Criteria may not be sufficiently protective of sensitive aquatic species such as Bull trout. For example, the Fish and Wildlife Service Final Rule for Bull trout (Department of the Interior Fish and Wildlife Service 50 CFR part 17 2010) states that:

“Special management considerations or protection that may be needed include the implementation of best management practices specifically designed to reduce these impacts in streams with bull trout, particularly in spawning and rearing habitat. Such best management practices could require measures to ensure that road stream crossings do not impede fish

migration or occur in or near spawning/rearing areas, or increase road surface drainage into streams.”

Increased logging of large trees in uplands and logging in riparian corridors pose clear and serious risks to imperiled and at-risk aquatic and riparian species. We are also extremely concerned that widespread upslope logging and roading activities will negatively affect Bull trout. For example, we the FS is proposing to build “temporary” road segments adjacent to headwater streams of Little Mill and Little Salmon Creeks, both of which are streams that support Bull trout. We are also concerned about the effects of extensive and heavy logging within RHCAs along streams that support Redband trout and other sensitive aquatic species, and that downstream habitats rely on for cold water inputs.

Fish, amphibians, and macroinvertebrate communities may be negatively impacted by excess fine sediment inputs resulting from logging and roads (Bryce et al. 2010, Nietch et al. 2005). Increases in fine sediment loading can cause simplification of 6 complex habitats and channel structure either through settling on or scouring out the streambed (Cover et al. 2008, Nietch et al. 2005). As a result, habitats such as pools, riffles, and side channels required by stream organisms for egg laying, resting, hiding, and rearing of young may be degraded or eliminated (Bryce et al. 2010, USEPA 2006). In addition, excess fine sediment loading, particularly in combination with the alteration of flow regimes and hydrologic processes, may negatively impact stream channel stability, limit hyporheic exchange, and alter groundwater inputs, potentially degrading conditions for stream organisms by further increasing sediment loading, decreasing necessary physical habitat, and altering stream water volume which can affect temperature and dissolved oxygen, and limit resources (Croke and Hairsine 2006, Moore and Wondzell 2005, Nietch et al. 2005, USEPA 2006). Fine sediment inputs exceeding natural background levels may bury and smother fish and amphibian eggs or young, decrease dissolved oxygen (DO) levels, interfere with behaviors such as mating, feeding and predator avoidance, cause shifts in macroinvertebrate community structures, and increase macroinvertebrate drift rates (Bryce et al. 2010, Nietch et al. 2005, USEPA 2006). For example, Coho salmon egg survival and fry emergence were negatively correlated with embedded fines of greater than 10%. In addition, when fines exceeded 20%, average survival decreases dramatically (Cederholm 1980). Macroinvertebrate drift rates increased significantly when exposed to suspended sediment concentrations of 8 mg/L for 5 hours, though ephemeroptera and plecoptera drift more rapidly upon exposure to sediments compared to those not exposed to sediments. Some ephemeroptera species, when exposed to concentrations of suspended sediments greater than 29mg/L for 30 days, 7 will disappear entirely. Longer exposure durations and smaller particle sizes caused increased rates of drift (IDEQ 2003).

The Forest Service must take responsibility for their part in the continued viability of fish that use key habitats on national forest lands, rather than downplaying and refusing to acknowledge the impacts from Forest Service Management, including logging, grazing, and roading. Logging on National Forests continues to cause ongoing negative affects to anadromous and resident fish populations that have important consequences for long-term trends and continued viability. proposal will greatly exacerbate these negative impacts to ESA-listed species. Increased logging of large trees will harm ESA-listed aquatic and riparian species, jeopardize their recoveries, cause downward trends in their populations, result in local extirpations or extinctions, and losses of viability.

Logging within RHCAs and logging of large trees is likely to exacerbate some of the negative effects of climate change on riparian and stream ecosystems. Stream temperature is a primary concern. Actions that minimize increased water temperatures are important for maintaining cold water refugia. The Independent Scientific Advisory Board (2007) states:

“Adequate protection or restoration of riparian buffers along streams is the most effective method of providing summer shade. This action will be most effective in headwater tributaries where shading is crucial for maintaining cool water temperatures. Expanding efforts to protect riparian areas from grazing, logging, development, or other activities that could impact riparian vegetation will help reduce water temperature increases. It will be especially important to ensure that this type of protection is afforded to potential thermal refugia. Removing barriers to fish passage into thermal refugia also should be a high priority.”

Salmon face serious threats to their continued existence due to climate change, and are predicted to suffer significant habitat loss. The Independent Scientific Advisory Board (2007) notes that according to some research predictions:

“[T]emperature increases alone will render 2% to 7% of current trout habitat in the Pacific Northwest unsuitable by 2030, 5%-20% by 2060, and 8% to 33% by 2090. Salmon habitat may be more severely affected, in part because these fishes can only occupy areas below barriers and are thus restricted to lower, hence warmer, elevations within the region. Salmon habitat loss would be most severe in Oregon and Idaho with potential losses exceeding 40% by 2090.”

Bull trout may lose over 90% of their habitat within the next 50 years due to increased stream temperatures as a result of climate change. Bull trout require very cold headwater streams for spawning, and so are likely to be disproportionately affected by stream temperature increases due to climate change. Recent projections of the loss of suitable habitat for bull trout in the Columbia Basin range from 22% to 92% (ISAB 2007). The US Fish and Wildlife Service notes that: “[g]lobal climate change threatens bull trout throughout its range in the coterminous United States....With a warming climate, thermally suitable bull trout spawning and rearing areas are predicted to shrink during warm seasons, in some cases very dramatically, becoming even more isolated from one another under moderate climate change scenarios....Climate change will likely interact with other stressors, such as habitat loss and fragmentation; invasions of nonnative fish; diseases and parasites; predators and competitors; and flow alteration, rendering some current spawning, rearing, and migratory habitats marginal or wholly unsuitable.”

Logging within RHCAs and upslope logging, particularly logging of large trees, would exacerbate stream temperature issues. Even localized temperature increases may have negative effects on struggling fish populations, especially when repeated in numerous streams across the project area and beyond. Past and current logging, grazing, and roads have increased stream temperatures to ecologically and legally unacceptable extremes. High stream temperatures, as well as increased fine sediment in many areas, are likely the pressing risks to fish viability and stream ecosystems. The synergistic effects of climate change, high temperatures, and increased fine sediments warrant actions such as protecting shade, ecosystem integrity, and terrestrial and aquatic connectivity. HRV of tree species composition and perceived wildfire dangers pose far less of a threat to these parameters than widespread logging of large trees.

In combination with climate change, the negative effects of increased logging of large trees may have especially severe consequences and unforeseen consequences. Logging has well documented negative effects on watershed hydrology and baseflows. In many areas, climate change is predicted to also lower baseflows and alter watershed hydrology.

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. Hicks et al. (1991)

found base flows increased for 8 to 9 years after clearcut logging because rainfall is not intercepted, evaporated, and transpired by trees. Instead, most rainfall becomes surface, subsurface, or groundwater flow once the trees are removed, and therefore contributes to base flow increases. However, the author found that base flow rates declined to lower than normal volumes in areas of hardwood riparian regrowth for the following 18 of 19 years in their study. 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.

We are concerned that logging within RHCAs and upslope logging, both of which include proposed logging of large trees, will have long-term negative effects on riparian and aquatic ecosystems that are vulnerable to climate change.

Logging in riparian corridors is likely to decrease connectivity, especially connectivity in mixed-conifer areas that currently serve as important corridors and are among the last remaining areas that can provide connectivity for species that are associated with LOS, mixed-conifer forests, denser forests, etc. Increasing connectivity is the most commonly recommended strategy for preserving biodiversity in the face of climate change, according to a review of 22 years of scientific recommendations (Heller and Zavaleta 2009). Increasing connectivity includes actions such as removing barriers to species dispersal, locating reserves near each other, and reforestation. Other commonly recommended connectivity-related actions include creating “ecological reserve networks [i.e.,] large reserves, connected by small reserves, stepping stones”; “protecting the “full range of bioclimatic variation”; increasing the number and size of reserves; and creating and managing buffer zones around reserves (Heller and Zavaleta 2009). Large blocks of habitat that are well-connected to each other are important for the long-term survival for many species in the face of climate change.

It is essential that we preserve core habitats and connectivity corridors because these areas are very important for maintaining genetic diversity, facilitating movement and migration, and providing for range and habitat needs. Connectivity corridors also allow for species to colonize new areas or recolonize after disturbances, which will help species adapt to shifts in geographic range due to climate change. Many species are already facing threats to their viability due to fragmentation and a lack of connectivity; climate change threatens to severely exacerbate risks to their continued survival by further fragmenting habitats.

The EA failed to adequately analyze or avoid the negative impacts of logging within RHCAs, upslope logging, and logging of large trees would likely exacerbate the negative ecological effects (both current and projected) of climate change.

The EA also failed to adequately consider the importance of carbon sequestration and storage, or to include the best available science on this issue. Large trees and intact, unmanaged forests sequester the most carbon. Logging is the largest source of carbon emissions in Oregon. (Law et al. 2018). The Forest Service failed to analyze how increased logging of large trees on federal lands would further increase carbon emissions, or consider alternatives to instead prioritize carbon sequestration.

ROADS:

There is overwhelming evidence based on peer-reviewed science, discussed throughout these comments, that logging, roading, and other activities proposed in the project harm water quality and imperiled aquatic species— particularly at the scale and intensity which the Baker City Watershed sale is proposing.

Increasing road densities in the Baker City Watershed project area would be harmful to water quality and to aquatic habitats, as well as to terrestrial and avian species that are sensitive to forest fragmentation and road-related disturbances. Note: “temporary” roads are not temporary, and the FS loses credibility and public trust every time the agency attempts to claim otherwise, despite evidence and common sense. ESA-listed fish and aquatic species continue to be jeopardized and face downward population trends as a result of high road densities across eastside forests. As a result, it is all the more important NOT to build or rebuild roads in the few areas that aren’t already overburdened with a high density of roads.

The bloated road networks on National Forests lands threaten the long-term viability of imperiled and ESA-listed fish such as MCR steelhead and Bull trout, and other imperiled or sensitive aquatic species. The Forest Service notes (USFS 2015) that “[t]he most important road related environmental issue is the effects of roads on aquatic resources in general, and specifically Threatened, Endangered and Sensitive aquatic species (bull trout, mid-Columbia steelhead, and Columbia spotted frog).”

Increased road densities have been correlated with low population levels and declines in bull trout and other aquatic species that rely on clean, cold waters (USFWS 2010). Of particular concern are roads that interact with stream channels. Such roads are likely to have disproportionately negative effects on water quality and sensitive fish (USFS 2018). Sedimentation from roads is known to be one of the largest contributors for degradation to water quality as well as a source of degradation to fish habitat and spawning areas. Roads in disrepair create safety issues and conflicts with protection for natural resources, especially for those such as water quality, aquatic species, and functioning wetland processes.

Carnefix and Frissell (2009) discussed impacts from roads, and show that significant negative impacts to sensitive aquatic species 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. Therefore, restoration strategies prioritized to reduce road densities in areas of high aquatic resource value from low-to-moderately-low levels to zero-to-low densities (e.g., 1 mile per square mile, lower if attainable) are likely to be most efficient and effective in terms of both economic cost and ecological benefit. By strong inference from these empirical studies of systems and species sensitive to humans’ environmental impact, with limited exceptions, investments that only reduce high road density to moderate road density are unlikely to produce any but small incremental improvements in abundance, and will not result in robust populations of sensitive species.”

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 have implicated roads as a primary factor in altering watershed hydrology and/or declines in fish stocks, and 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; Carnefix and Frissell 2009; DellaSala et al. 2011; Frissell and Carnefix 2007; Rieman and Clayton 1997, Rieman et al. 2000, Thurow et al. 2001; Public Lands Initiative/Trout Unlimited 2004; Western Native Trout Campaign 2001; Quigley and Arbelbide 1997)

The effects of roads and stream sediments on stream integrity and aquatic habitats affect Bull trout, Steelhead, and other fish are well recognized. The Federal Registrar, Department of the Interior Fish and

Wildlife Service 50 CFR part 17 (2010) Final Rule for Revised Designation of Critical Habitat for Bull Trout also recognizes the ecological threats posed by roads to fish and water quality:

*“Sedimentation negatively affects bull trout embryo survival and juvenile bull trout rearing densities (Shepard et al. 1984, p. 6; Pratt 1992, p. 6). 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 (*Oncorhynchus 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.”*

Meredith et al. 2014 found that increased logging of large trees resulted in increased road-related impacts, potentially negatively affect the abundance and recruitment of wood in streams. The authors found that high road densities have been correlated with lower large wood abundance in streams. The presence of roads in RHCAs also may increase solar radiation and stream temperatures.

The NOAA 5-Year Review of Snake River Salmonids notes the synergistic negative effects of both logging and roads occurring in watersheds:

“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.”

Other National Forests acknowledge the risks that roads and high road densities have on fish and water quality, not only when limited to roads directly within the RHCAs. For example, in the Upper Touchet sale on the Umatilla NF, the FEA states: “Road density is used as an indicator of potential for affects to hydrologic function (extension of the stream network) and water quality (sediment delivery to surface waters). Stream crossings are used as an indicator of the degree of connectivity between the road system and the drainage network. To the degree that roads are connected to the drainage network the risk of road sediment reaching surface waters is increased, the drainage network is lengthened and the potential for precipitation to drain more quickly, with less residence time in the watershed is increased. Roads have the potential to intercept surface and subsurface water, reducing infiltration and increasing the delivery of water to channels. Roads which are hydrologically connected are a risk to water quality. Sedimentation may be increased by surface erosion from roads and the ability of road drainage to route sediment to channels.”

Also from the Upper Touchet DEA: “Roads have the potential to intercept surface and subsurface water, reducing infiltration and speeding the delivery of water to channels. Sedimentation may be increased by surface erosion from roads and the ability of road drainage to route sediment to channels. Road density alone does not indicate slope position, another critical factor. Valley bottom roads have the most direct effect on streams and riparian areas because of accelerated erosion and loss of streamside shade. Mid-slope roads intercept subsurface runoff, extend channel networks and accelerate erosion, and ridge top

roads can influence watershed hydrology by channeling flow into small headwater swales, which may accelerate channel development. McCammon (1993) assigned three watershed risk classes based on road density (mi/mi²) to assess the potential of road impacts to adversely affecting hydrologic function and water quality: low (< 3), moderate (3.1-4.5) and high (> 4.5). The Upper North Fork Touchet SWS road density is 1.4 mi/mi². ”

Another example the USFS’s Draft EA for the Mill Creek sale in the Ochoco NF: *“Roads are a major source of erosion and stream sedimentation on forested lands. Roads can increase erosion rates and turbidity three orders of magnitude greater than the undisturbed forest condition (Megahan 1974). Sediment eroded from the road prism can be delivered to a forest stream, resulting in increased turbidity, sediment loads, and degraded habitat for fish. Research has shown that roads have the greatest effect on erosion relative to other forest management practices (Megahan and King 2004). ”*

The Watershed Report states that planned roading includes construction of up to 10.3 miles of “temporary” roads would occur in the uplands and 0.08 miles of “temporary roads” would occur in RHCAs. The report also notes that “log haul would take place on 105 miles of Forest roads across the project area as a result of alternative 2.” We are extremely concerned about the construction of “temporary” roads and skid trails, extensive road maintenance, cable corridors, and haul routes, and the well-documented negative effects on streams, water quality, and watershed hydrology that will result from these activities.

We are also concerned about the potentially massive amount of felling and logging of large trees as “danger” trees, and for construction of these road and haul related corridors.

The Baker City Watershed DEA proposes tethered logging (even within RHCAs) which can result in extensive cutting of trees, including large and old trees. What is the FS’s estimate of number of large trees cut due to designation as “hazards” or felled along roads (including roads that are not major routes, closed or overgrown roads, or temporary roads)?

Felling of trees for “temporary” roads, skyline logging or cable-assisted corridors, and other similar actions may result in excessive and widespread logging of large trees. Allowing large trees to be sold in these circumstances incentivizes cutting them, and inappropriately sidesteps environmental analyses and public transparency. We have similar concerns about logging within fuel breaks and ember reduction zones. Will fuel breaks be treated similarly to roads or haul routes, and result in the felling of large trees in and adjacent to the fuel break?

BMBP’s recent post-logging field surveys in Forests in Eastern Oregon, such as the Malheur NF, suggest that the felling of large and old trees in relation to hazard trees and clearing road beds, skid trails, haul corridors, etc. can be very extensive. The pictures below are of recent felling of large and mature or old Ponderosa pine trees, most of which were felled as “hazard” trees or for road, haul, skid trails, or cable corridors in the Big Mosquito and Camp Lick timber sales. Dozens of large mature and old Ponderosa pines were felled in the Big Mosquito sale. Logging in the Camp Lick sale has only just begun, and already BMBP found legacy Ponderosa pines felled as part of either “hazard” tree felling or “temporary” road and other road-related work. The FS confirmed that many of the trees depicted in the pictures below were sold at the mill.





The Forest Service often builds or rebuilds “temporary” roads (that have impacts for decades or centuries on the landscape), as well as rebuilds “existing temporary roads” to access logging units. Roads that the agency terms “temporary” are not in reality “temporary”. This is made evident by the repeated re-use of ‘existing roadbeds’ and the use of ‘existing disturbance areas’ for creating roads with each new timber sale. The Forest Service continues to repeatedly re-use these areas of permanent disturbance on the landscape as roads in current timber sales (and the USFS regularly uses these roads as reasons for disqualifying areas for IRAs or Potential Wilderness). Yet the USFS repeatedly claims that these roads won’t actually continue to exist beyond each new timber sale’s completion. These roads remain as scars on the landscape and show signs of erosion, compaction, or other impacts for years if not decades to come. “Temporary” roads which were not decommissioned or recontoured are ubiquitous on the landscape. They are also not well-documented or monitored, and they are often not included in road density calculations.

Road densities that exceed standards are a regular problem in watersheds and across eastside forests. Existing road density in many areas of the Wallowa-Whitman National Forest is well above the 2-miles/square mile NOAA (1996) threshold for watersheds to be considered “properly functioning”. NOAA (1996) notes: properly functioning: 2 miles/sq mile; at risk 2-3 mi/sq mi; not properly functioning >3mi/sq mi. The widespread, chronic negative impacts to watersheds and streams caused by the bloated, unsustainable, and badly managed road network across public lands must be addressed by the agency.

Furthermore, the Wallowa-Whitman National Forest has not yet completed Travel Planning as required by the 2005 Final Rule for Travel Management. The Wallowa-Whitman National Forest currently has existing road densities at levels that are recognized as threats to water quality, fish, and watershed health, and exceed Forest Plan standards for road density in many watersheds, including those designated for prioritizing the protection of water quality and fish. Wilderness and Roadless areas occupy a small

percentage of National Forests in the Blue Mountains, and the excessive road density outside of these areas has serious and ongoing negative ecological consequences for the majority of watersheds on these forests. Wilderness areas, for example, occupy approximately 17.1 percent of the combined area of the Malheur and Wallowa Whitman National Forests, and only four percent of Oregon's total land area. The agency needs to abandon their narrow attempt to increase large tree logging and instead address the actual causes of ecosystem degradation across the landscape.

The bloated and sprawling road systems on National Forest lands, including the Malheur and Wallowa-Whitman National Forests, are fiscally burdensome as well as ecologically harmful. In discussing budget shortfalls, the Forest Service notes, for example, that on the Wallowa-Whitman National Forest, it would take approximately \$64 million dollars to bring the entire road system back up to standard, and approximately \$6.8 million dollars to keep it that way (US Forest Service (2015). Malheur National Forest Forest-Wide Travel Analysis. Pg. 28.)

Across Oregon and Washington, the USFS manages approximately 90,000 miles of roads. The agency notes that it is “a challenge to maintain all roads to proper safety and environmental standards to increased use, aging infrastructure, and decreasing budgets. Many roads, built between 1950 and 1990, have exceeded their designated lifespan and require costly repairs. Unmaintained roads and infrastructure can impact water quality and wildlife habitat, especially fish-bearing streams. Backlog maintenance projects top \$1.2 billion, and funds available for road maintenance are only about 15% of what is needed to fully maintain the current road system.” (US Forest Service. Webpage. Accessed at: <https://www.fs.usda.gov/detail/r6/landmanagement/?cid=fseprd485439>)

The Wallowa-Whitman has 4,633 miles of open roads and 4,486 miles of closed roads for a total of 9,119 miles of existing roads. One could drive from the northwestern tip of Washington state to the farthest northeastern tip of Maine, down to Miami, Florida, over to San Diego, California, and back up to the northwestern tip of Washington state, and still not have traveled as many road miles as are contained within the Wallowa-Whitman National Forests. The USFS notes that “of the 90,000 miles of Forest Service roads in Oregon and Washington, about 2/3 of those are currently open and maintained for both public and administrative uses.” The USFS estimates that approximately 12% of the overall road network is “likely not needed”, with many of these unneeded roads already being “closed or stored”, and only about 20% or 2,000 miles being currently open to the public. (US Forest Service. Travel Analysis Report. Wallowa-Whitman National Forest. Table 3, page 19. Accessed online at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd486098.pdf)

We are also extremely concerned about road-related fish passage barriers, which are an enormous problem for fish across the region. True restoration would focus on issues such as culvert repair and other fish passage barrier removals. The Baker City Watershed project area includes road-related issues with fish passage, with the Aquatics report noting that “Impassable culverts observed in the project area with documented upstream habitat include: • Two culverts on Marble Creek, on National Forest System (NFS) Roads 6510 and 6510100”. Based on our decades of field survey experience, many additional barriers to fish passage are likely to exist within the project area in relation to failed or compromised culverts and other road-related issues. Does the FS have both a plan and funding in place to remove or repair these fish passage barriers in the project area? Why is culvert repair and addressing problematic road issues the highest priority for restoration in the Baker City Watershed project-- particularly given that roads are likely the primary driver (along with livestock grazing) of water quality impairments and negative stream impacts across the region?

CUMULATIVE IMPACTS AND FORESEEABLE ACTIONS:

The DEA notes that “[f]ollow-up maintenance burning is planned on an average 10-year cycle within the project area.” Unfortunately, Cumulative impacts of stated plans to repeatedly manage forests within the project area were not analyzed:

The DEA has not analyzed the cumulative impacts of repeated burning every 10 years across the project area. Clearly, these plans are in the foreseeable future, with clear intent from the Forest Service. However, such management potentially carries with it cumulative negative impacts.

- Roads: for example, such management requires repeated road maintenance and access. What is the over-arching plan with road access for such repeated management for this and other projects on the Wallowa-Whitman National Forest? Does the Forest Service intend to maintain the bloated and expensive road network that exists, which the FS has admitted it does not have the funding to maintain or fix? And which the agency has admitted are causing detrimental impacts to fish and water quality, as well as negative impacts to species such as elk and other animals sensitive to roads?
- Wildlife: What of the native species, many of which are struggling or declining, that depend on dense and complex forest canopies, such as those found in unlogged multi-story mixed conifer forests? Repeatedly managing forests for low-severity fire also has potentially severe and negative ecological impacts for numerous species, including marten, lynx, black-backed woodpeckers, numerous species that rely on dense and complex canopies, cavity-dependent species, species that rely on dead wood, species that rely on a high density of downed logs, and many others.
- Prescribed fire is not the same as wildfire. Prescribed burns can and do cause ecologically important damage to crucial wildlife habitat, particularly if done in ecologically inappropriate areas such as fire and climate refugia. We are also concerned about the loss of snags and downed logs, and note that prescribed burns do not necessarily mimic the same dynamics as wildfire. In addition, timing of prescribed burns, such as those done in spring, potentially interrupts delicate life cycle rhythms of wildlife, such as egg laying and hatching and can harm insects, butterflies, nesting birds, and other species. and that prescribed fire can cause lasting, long-term negative reductions in snags, logs, and dead wood habitats (Arkle and Pilliod, 2010; Pilliod et al. 2006).
- Given that riparian corridors are disproportionately relied upon by many species for connectivity, key habitat, thermal refugia and shade, and other parameters provided by these often denser, complex forests—what effect will repeated prescribed burning every 10 years have on the species that rely on riparian corridors for at least part of their life cycles?
- Snags and downed wood have lower densities in logged forests.
- Large severe fires are climate driven, and are expected to increase as a result of climate change. Fuels reduction activates have little to no impact on large, climate-driven fires.
- While logging and burning forests sometimes correlates to reduced fire severity or altered fire behavior— this is only true for fire events that are not weather and climate driven, and only for a very short period of time before these logged and burned areas start to grow back and “fuels

reduction treatments” are no longer effective [cite]. Forests often grow back more densely and homogenously than before they were logged, creating an even more flammable situation [cite].

- Creating artificially open forest canopies makes more susceptible to heat, solar radiation, and wind, and can exacerbate fire risk
- Heavy, industrial-scale logging increases fire risk.
- More protected forests are not at increased risk of more frequent or severe fires.
- Reducing CO2 emissions is the most effective way to combat climate-driven wildfires—not more logging, which increases carbon emissions. Logging is the largest cause of carbon emissions in Oregon. [cite and cite]
- Most home losses to fire in the US are the result of grass fires. The Forest Service is not going to be able to log its way to safer communities or restored forests.
- Home hardening is the most effective strategy for keeping communities safe.

There is a very short window of time that “treatments” will be effective, usually ~10-15 years. “Treated” (logged) areas having a vanishingly small chance of encountering a wildfire during that 10-15 year window of time (Rhodes and Baker 2008). However, the FS appears to be planning to repeatedly “manage” forests (i.e., logging, burning, and roading) on a 10-15 year cycle across the project area and perhaps across much of the region in numerous timber sales. Such “management” is impractical, expensive, ineffective, and would have catastrophic consequences for fish, wildlife, and water quality.

Radeloff et al. 2023 found that most homes that burned in the US were destroyed by grass and shrub fire, not forest fire. This dynamic highlights the realities of climate-driven wildfire and lack of efficacy in logging to control fire behavior. [Reporting from CNN](#) about the study notes:

“Over the last three decades, the number of US homes destroyed by wildfire has more than doubled as fires burn bigger and badder, [a recent study found](#). Most of those homes were burned not by forest fires, but by fires racing through grass and shrubs.

The West is most at risk, the study found, where more than two-thirds of the homes burned over the last 30 years were located. Of those, nearly 80% were burned in grass and shrub fires.”

Another concern we have that much of the prescribed burning in the project area could be comprised of burning slash, including slash piles in RHCAs. Such burning can severely damage soils, and often supports some of the highest concentrations of invasive weeds on Forests. The USFS notes that prescribed fire units would include jackpot burning, which involves “burning of slash concentrations to reduce excess slash generated in harvest and/or non-commercial thinning units. Generally, jackpot burning is used to burn pockets of slash within a unit or to ignite specific targets within the unit without spread through the remainder of the unit. Jackpot burning would be accomplished through hand ignition techniques.”

We also want to note that recent research found that the majority of fire ignitions that cross jurisdictional boundaries start on private lands, not public, and that most fires are started by human activity. [OSU Newsroom coverage discussed the Downing et al. 2022 study:](#)

“The study area covered almost 141 million acres across 11 states and included 74 national forests.

Of all ignitions that crossed jurisdictional boundaries, a little more than 60% originated on private property, and 28% ignited on national forests. Most of the fires started due to human activity.”

We are concerned that building and reopening roads will further increase human access to these and other timber sale areas, which in turn increases the risk of human-caused ignitions. In addition, we note that this study counters the common narrative that fires are going to ‘pop out’ of National Forests to affect nearby communities.

Climate change

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 Baker City Watershed sale, and other recent and current FS sales, will increase CO₂ 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.

Global climate change poses unprecedented threats to humanity and forests. Climate change is caused by excess CO₂ 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 recent 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 important for carbon storage and for carbon sinks—they store carbon in both the soils and the vegetation, and 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. 2020 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:

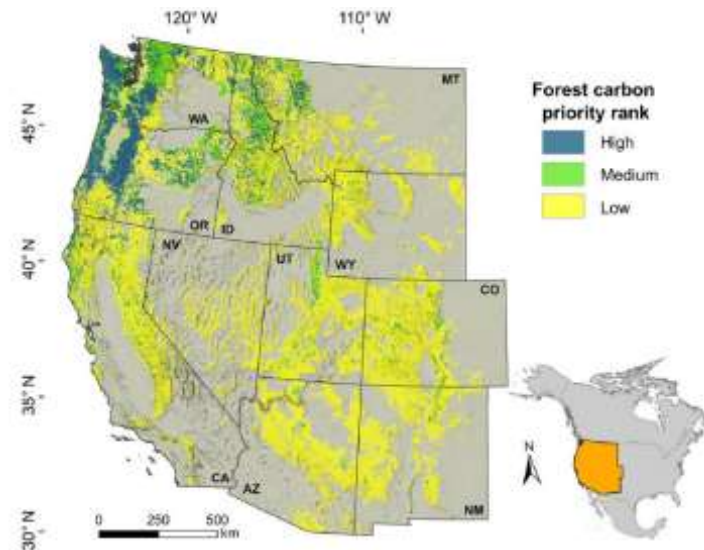


FIG. 1. Forested land in the western contiguous United States classified into priority for preservation to mitigate climate change based on the spatial co-occurrence of low vulnerability to drought and fire and low, medium, and high potential carbon sequestration. WA, Washington; ID, Idaho; MT, Montana; 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 presettlement 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 disproportionately 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.

Law et al. 2022 highlights the need for a paradigm shift for managing forests on public lands:

“The recent Intergovernmental Panel on Climate Change report on impacts, mitigation, and adaptation found, and member countries agreed, that maintaining the resilience of biodiversity and ecosystem services at a global scale is “fundamental” for climate mitigation and adaptation, and requires “effective and equitable conservation of approximately 30 to 50% of Earth’s land, freshwater and ocean areas, including current near-natural ecosystems.” Our key message is that many of the current and proposed forest management actions in the United States are not consistent with climate goals, and that preserving 30 to 50% of lands for their carbon, biodiversity and water is feasible, effective, and necessary for achieving them.”

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 the full compliment of native species, as well as species such as Bull trout and other ESA-listed species. 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.).

Further, we are very concerned that the FS has systematically overlooked evidence that mixed-severity fire regimes are more widespread than generally acknowledged by the agency. For example, Baker et al. 2023 discuss in their abstract:

“The structure and fire regime of pre-industrial (historical) dry forests over ~26 million ha of the western USA is of growing importance because wildfires are increasing and spilling over into communities. Management is guided by current conditions relative to the historical range of variability (HRV). Two models of HRV, with different implications, have been debated since the 1990s in a complex series of papers, replies, and rebuttals. The “low-severity” model is that dry forests were relatively uniform, low in tree density, and dominated by low- to moderate-severity fires; the “mixed-severity” model is that dry forests were heterogeneous, with both low and high tree densities and a mixture of fire severities. Here, we simply rebut evidence in the low-severity model’s latest review, including its 37 critiques of the mixed-severity model. A central finding of high-severity fire recently exceeding its historical rates was not supported by evidence in the review itself. A large body of published evidence supporting the mixed-severity model was omitted. These included numerous direct observations by early scientists, early forest atlases, early newspaper accounts, early oblique and aerial photographs, seven paleo-charcoal reconstructions, ≥18 tree-ring reconstructions, 15 land survey reconstructions, and analysis of forest inventory data. Our rebuttal shows that evidence omitted in the review left a falsification of the scientific record, with significant land management implications. The low-severity model is rejected and mixed-severity model is supported by the corrected body of scientific evidence.”

Similarly, the FS fails to analyze, for example, what proportion of Forests have been logged to “restore” Ponderosa pine? What portions of Forests outside of wilderness and roadless areas are currently considered Ponderosa pine plantations? What portion of forests outside of Wilderness and Roadless are

currently considered to be young Ponderosa-pine dominant forests? What portion of these forests have been previously logged/thinned? What portion has been logged within the past 20, 50, and 80 years?

We also have concerns about prescribed fire, particularly landscape-scale prescribed fire in sensitive or remote areas (including RHCAs) 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 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.”

In addition, recent research suggests that Grand fir forests are more fire resistant than generally assumed by the agency. Moris et al. 2022 found:

"The grand fir forest type had severity values at the same level of forest types dominated by fire-resister species despite grand fir was classified as a fire-avoider species. ... In many ponderosa pine forests maintained historically by a high frequency, low-severity fire regime, the transition towards denser forests dominated by Douglas-fir and grand fir would explain why ponderosa pine and Douglas-fir still compose a significant proportion of basal area in the grand fir forest type, and many maintain large, old, fire-resistant ponderosa pine trees (Johnston et al. 2021; Merschel et al. 2021). Therefore, the particular structure and composition of these “recent” grand fir forests (e.g., Merschel et al. 2014), with an important presence of large-diameter trees of fire-resistant species, may provide latent fire resistance (Larson et al. 2013)."

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**”*

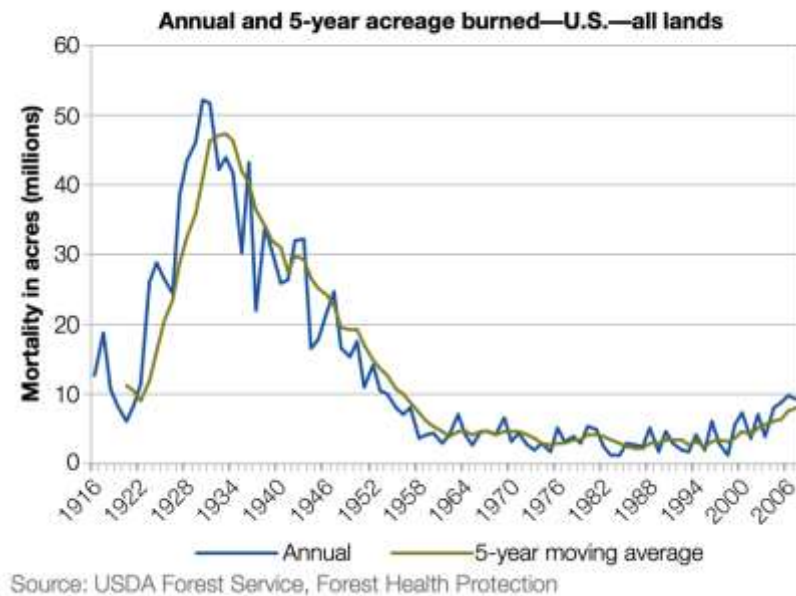
“To improve clarity in communication, we propose that “low/ moderate-severity” be applied to those regimes where, as the term implies, high-severity fire is absent. These circumstances appear to be quite rare in the ponderosa pine and mixed-conifer forests of western North America. Therefore, a fire 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 moisture 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:

Figure 16-1. Total acreage burned.



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.

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.”

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 moisture or drought, and that larger fires corresponded to drought cycles. Today's high severity fires were found to be within natural range of variability.

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). Their research has 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 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 OF “FUELS REDUCTION”:

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.”

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).”

DellaSala et al. 2022 highlight the often-overlooked negative environmental impacts of logging and thinning in the name of fire suppression:

“Active Management Approach (MFAMA) in an attempt to contain wildfires increasingly influenced by top down climate forcings. Wildfire suppression activities aimed at stopping or slowing fires include expansive dozerlines, chemical retardants and igniters, backburns, and cutting trees (live and dead), including within roadless and wilderness areas. MFAMA involves logging of large, fire-resistant live trees and snags; mastication of beneficial shrubs; degradation of wildlife habitat, including endangered species habitat; aquatic impacts from an

expansive road system; and logging-related carbon emissions. Such impacts are routinely dismissed with minimal environmental review and defiance of the precautionary principle in environmental planning. Placing restrictive bounds on these activities, deemed increasingly ineffective in a change climate, is urgently needed to overcome their contributions to the global biodiversity and climate crises. We urge land managers and decision makers to address the root cause of recent fire increases by reducing greenhouse gas emissions across all sectors, reforming industrial forestry and fire suppression practices, protecting carbon stores in large trees and recently burned forests, working with wildfire for ecosystem benefits using minimum suppression tactics when fire is not threatening towns, and surgical application of thinning and prescribed fire nearest homes.”

Baker et al. 2023 determined that nature-based solutions that emphasize natural disturbances are a viable and important strategy:

“Natural disturbances, unlike mechanical treatments, select survivors that are more likely to be genetically adapted to survive future disturbances and climate change, while perpetuating ecosystem services. Natural disturbances also could ecologically restore forest heterogeneity, better maintain carbon storage, and reduce management needs. A fully developed disturbance-based NbS could more effectively adapt dry forests to climate change within ~30–40 years if active management is reprioritized to protect the built environment and communities near public forests.”

Noss et al. 2006 also highlighted the paradigm shift needed for true restoration:

“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.”

HISTORICAL DOCUMENTS:

Below are excerpts from historical documents, primarily USFS historical documents, that discuss “north slope” type forests, and the density and species composition of those forests:

The historical documents cited below can be found on this USFS webpage:

https://www.fs.usda.gov/detail/umatilla/learning/history-culture/?cid=fsbdev7_016132

Bolded emphases below are ours.

Excerpts from:

Evans 1912 GENERAL SILVICAL REPORT FOR WALLOWA AND MINAM FORESTS

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_015545.pdf

“As its name signifies, the characteristic tree of this type is yellow pine. However, this rarely occurs pure, its chief associates being Douglas fir, western larch, grand fir, and lodgepole pine. Besides these, black cottonwood, birch and alder are coming along stream bottoms, western juniper is sometimes found on dry ridges and western yew occurs in moist sheltered locations. Of the chief associates mentioned, lodgepole pine is apparently a fugitive tree, its presence usually being due to the influence of some external factor, such as fire, windfall or insect infestation, while its optimum range is in the higher zone. **Douglas fir, larch, and grand fir can always be found as scattered individuals, while on north slopes and at the heads of draws, they form a subtype from which yellow pine is practically excluded. The same thing sometimes happens in canyon bottoms, due apparently, to the excess of shade and moisture.**”

Excerpts from:

Heintzleman 1913. *Whitman National Forest Annual Silvical Report North Slope Sub-Type of the Blue Mountains*. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_015535.pdf

“The stand is very dense and the amount of debris upon the ground is very large.”

“Occurrence of the North Slope Sub-type.

The physical feature which determines to a large extent if an area is “North Slope” or “Slope” is moisture in the soil and in the air. **A good supply of moisture during the growing season is very favorable to the four inferior species named above and yellow pine cannot compete with them successfully. Their reproduction is so dense and fast-growing that yellow pine is choked out.**

It is interesting to note the extent to which these inferior species are dependent upon abundant moisture. Small knolls and side ridges jutting out from a north slope area are covered almost invariably with an open stand of yellow pine due to the exposure to sun and wind, which dry out the soil and thus make the site unfavorable for the north slope species.

Much of the yellow pine on north slope areas occurs on this kind of site. The yellow pines which occur as scattered individuals throughout the entire stand undoubtedly secure a foothold in openings made by windfall or otherwise when a number of unusually dry summers occurring in succession produce soil conditions favorable to reproduction of this species.

The name “North Slope Sub-type” is rather misleading for the aspect cannot always be taken as an indication of the presence of this class of forest. A cool situation is the only condition demanded and very frequently it is found on moist flats, the lower slopes and bottoms of canyons with any aspect whatever and the summits of flat-topped ridges. In fact, numerous examples

have been seen of this type occupying west and southwest exposures on one side of a canyon and the east and northeast exposures on the opposite side carrying slope type. Here the east slopes were warm, having bedrock close to the surface with numerous large outcrops in many places. The west exposures were cooler, due to deep soil and gentle slopes. A better name for the sub-type would be one that indicates its occurrence on cool sites.

There is a difference of opinion as to just what constitutes this sub-type, or, in other words, where to draw the line between it and the slope type on the lower situations, and between it and the transition type at the upper limits of its occurrence.

At the lower elevations areas are frequently found to contain quite a number of yellow pine trees per acre, although **north slope species occupy the greater percentage of the ground space**. Also, slope type conditions sometimes grade gradually in north slope, the per cent of yellow pine decreasing and grand fir, Douglas fir, etc., increasing.”

Excerpts from:

Langille 1903. *The Proposed Heppner Forest Reserve Oregon*.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_015593.pdf

Pg. 5: “The north slope type is represented by a mixed growth of the other species named, and occupies, mostly, the north and east exposures, **though on the north side of the mountains it covers the bottom lands which contain sufficient moisture to promote the growth of its components, and frequently creeps up the western and southern exposures. Over the greater part of the area covered by this type (and that is much the greater portion of the withdrawal),** the forest occurs in open stand which differ materially in height, diameter, and volume of merchantable timber. Naturally, the best timber is found along the canyon and ravine bottoms, where a stand of from 20 M to 30 M is sometimes attained, but on the slopes the stand immediately decreases until, on the crests of the low ridges, it runs not higher than 3 to 10 M per acre, even in the most continuous forest.”

Pg. 7: “**That the forest has a highly beneficial effect upon the water flow can not be questioned. Most of the living streams find their sources above the yellow pine zone in small, swampy tracts; the creeks which head lower in the yellow pine belt run dry early in the season. Even as early as June 20 the question of water for sheep was a serious one at the lower altitudes where the larger streams flow through deep gorges. Throughout the entire territory the relation between the forest and the water flow is apparent. Where the forests are dense, springs are numerous. Doubtless the reverse is equally true, but the dependence of each upon the other is obvious.**”

Excerpts from:

Starker 1915. *Recommendations for Cutting Inferior Species On the Whitman National Forest, Oregon*.

https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5414184.pdf

Pg. 3: “North Slopes. **The true north slope type is composed of the following species: Douglas fir, western larch, white fir, lodgepole pine and only an occasional yellow pine.** The yellow pine that does occur is usually mature and of good quality, **the dense stand making them clean themselves well;** but this density prevents the growth of seedlings and small trees are rare...”

Thank you for consideration of our comments. Please keep us informed of all developments with this project in a timely manner.



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Paula Hood
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Austin Starnes
Staff Attorney, Blue Mountains Biodiversity Project

Citations for Baker City Watershed Fuels Management Project Re: logging and wildfire

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