APPEAL TO THE REGIONAL FORESTER, PACIFIC NORTHEWEST REGION, USDA FOREST SERVICE REGION SIX, OF A DECISION OF THE ACTING DISTRICT RANGER FOR THE NORTH FORK JOHN DAY RANGER DISTRICT AND THE FOREST SUPERVISOR OF THE UMATILLA NATIONAL FOREST

LEAGUE OF WILDERNESS DEFENDERS - BLUE MOUNTAINS BIODIVERSITY PROJECT and SIERRA CLUB, APPELLANTS, vs. KRISTY GROVES, ACTING DISTRICT RANGER, NORTH FORK RANGER DISTRICT, DECIDING OFFICIAL, KEVIN MARTIN, FOREST SUPERVISOR, UMATILLA NATIONAL FOREST DECIDING OFFICIAL and UNITED STATES FOREST SERVICE, UNITED STATED DEPARTMENT OF AGRICULTURE	**In Re: Appeal of the Record of Decision and the Final Environmental Impact Statement for the Farley Vegetation Management Project** USDA Forest Service North Fork John Day Ranger District, Umatilla National Forest

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APPELLANTS' NOTICE OF APPEAL,
REQUEST FOR RELIEF, AND
STATEMENT OF REASONS

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DATED THIS 11th DAY OF SEPTEMBER, 2009

I. Notice of Appeal.

Title of Decision Document: Record of Decision, USDA Forest Service, Umatilla National Forest, North Fork John Day Ranger District, Farley Vegetation Management Project Final Environmental Impact Statement.

Responsible Official: Kristy Groves, Acting District Ranger, North Fork Ranger District and Kevin Martin, Forest Supervisor for the Umatilla National Forest, issued a Record of Decision (ROD) for the Farley Vegetation Management Project (FEIS). The Forest Supervisor approved Alternative 2 with some modifications.

The chosen alternative (the "Farley Project") authorizes commercial and non-commercial logging on over 7,000 acres of land along with associated ground-disturbing activities. Pile burning and prescribed burning will occur on over 2,700 acres of land. The Farley Project involves 9.5 miles of new road ("temporary") construction and 36 miles of reconstructed roads. While the use of these roads may be "temporary" the road impacts will continue for decades to centuries after. And, for the reconstructed roads, many of these roads no longer exist functionally speaking and the reconstruction is essentially equivalent to building a new road.

There are a number of significant shortcomings in disclosures of the impacts and science in support of the proposals contained in the Farley Project FEIS (the "FEIS" or the "Farley Project") and the Record of Decision ("ROD). The FEIS conflates the need to enter certain lower elevation forests to alter stand composition as a reason to enter into moderate to higher elevation mixed conifer and sub-alpine fir forests. The entry into more moist and sub-alpine mixed conifer forests for purposes of increasing resilience to wildfire and insect outbreaks is not supported by any credible ecological research in the FEIS. The decision approves soil-damaging ground-based tractor, forwarder, and skyline commercial logging across thousands of acres. The project would re-open many miles of closed and seasonally closed roads, construct new roads and build "temporary" roads which would nonetheless continue to have impacts for decades to come. The decision will authorize the creation of large landings and authorize machine piling and burning (which creates large craters of mineralized soil) across hundreds of acres.

The FEIS claims the project will "maximizes the economic benefits to the regional and local economy" while lacking substantive economic data to credibly support this claim, but this does not square with the management designation for the land. The decision would generate wood products from commercial logging at a time when there is little economic feasibility or societal need or demand for wood products, including saw logs and wood fiber.

In support of this appeal position, Appellants submit declarations from Jonathan J. Rhodes and Dr. Richard H. Waring. The expert declarations prepared by Dr. Waring and Jonathan J. Rhodes cogently highlight pertinent scientific information that is directly relevant to the Farley Project and underscore what is missing in the FEIS in terms of adequate disclosure and analysis of the actions proposed as part of the Farley Project.

II. Project Location and Description.

Record of Decision signed: June 24, 2009
Date of Publication: July 28, 2009
Deciding Officer Name and Title: Kristy Groves, Acting District Ranger.

The project analysis area is located in the Desolation Creek watershed in the North Fork John Day Ranger District in Grant County, Oregon (Figure R-1). The Desolation Creek watershed covers a total of 69,674 acres; 56,226 acres are National Forest System land and 13,448 acres are private land. Of the National Forest land 10,578 acres are inventoried roadless or wilderness, leaving approximately 45,648 acres available for management. Forest management activities for this project are proposed to occur in primarily C7 Special Fish Management and A4 Viewshed 2 management areas designated by the Forest Plan. The goal of the C7 management area (majority of the analysis area) is to maintain and enhance water quality and produce high levels of anadromous fish habitat on an area-wide basis.

The project is located within Section 1, T. 7 S., R. 31 E.; Sections 5, 6, 9-11, 13, 14, 23, 24, T 7 S., R. 32E.; Sections 18-23, 26-36, T. 7 S., R. 33 E.; Sections 10-14 and 24, T. 8 S., R 32 E.; Sections 1-36, T 8 S, R 33 E; Sections 29-33, T 8 S, R 34 E; Sections 1-4, 9-13, T 9 S, R 33 E; and Sections 3-10, 16-21 and 28-33 T. 9 S., R. 34 E., Willamette Meridian. The project proposes:

- 2340 acres of regeneration harvest and commercial thinning
- 4887 acres of non-commercial thinning
- 9.5 miles of new temporary road construction
- 36 miles of road reconstruction
- 169 miles of haul roads
- 31 miles of road obliteration
- 1,016 acres of suitable marten habitat will be regen harvested
- 605 acres of pileated woodpecker nesting habitat and 746 acres of pileated woodpecker foraging habitat would be regeneration harvested
- Over 2100 acres of regeneration and over 250 acres of thinning in habitat for Red-breasted nuthatch, Mountain chickadee, Hairy woodpecker, and Northern flicker
- Significant impacts to marten woodpeckers and other wildlife associated with large snags and dead wood

The North Fork of the John Day and Desolation Creek are part of a large network of wild and scenic waterways which serve as strongholds for inland native trout and salmonids. The area includes large amounts of natural mixed conifer forests with moist plant associations, both in high elevations or in moisture-retaining hollows or on North-facing slopes. The Farley project area shows signs of active Pileated woodpecker use, including fresh Pileated foraging, Pileated nest and roost holes, and Pileated sightings and calls. Almost all units also show evidence of active elk use--scat, tracks, and/or sightings. Nearly all units contain significant old growth structure with quality varying

but ranging from residual old growth structure from past logging to high quality mixed conifer old growth. Many sale units had evidence of active use by other Management Indicator Species such as Northern Three-toed and Blackbacked woodpeckers and Williamson's Sapsuckers. Proximity of units to streams was common with streams and creeks usually being downhill from the unit or adjacent to it, often with moderate to steep slopes (of variable degree), most often North-facing with ashy, easily displaced soils that could enter streams as sedimentation, impairing water quality and downstream habitat.

There is already a whole lot of forest fragmentation in the area--especially of mixed conifer old growth such as in the sale units, yet the remaining old growth structure in most sale units makes them a magnet for concentrated wildlife use, as the surrounding area is usually dominated by past clearcuts now filled in with dense young Lodgepole pine. The proximity of the North Fork John Day Wilderness and roadless areas makes this project area a particularly important dispersal and connectivity corridor zone for Canada lynx, Wolverines, and Gray wolves. There is ample Snowshoe hare and squirrel prey for lynx and abundant elk and deer for wolf predation and wolverine scavenging. Elk and deer are likely heavily reliant on the Farley area sale units for thermal and hiding cover to relieve hunting pressure, which is great there. The importance of the area to potential lynx, wolverine, and Gray wolves in the context of fragmented interior forest cannot be understated. The dense mixed conifer old growth habitat and cover is critical for these species.

Most of the closed roads in the Farley Project area were obviously closed for good reasons--steepness and erosive slopes leading downhill to streams and creeks and sometimes hydrological connections to streams leading sediment down to such critical fish habitat as Desolation Creek and the downstream North Fork John Day River. Most closed roads are either already well re-grown with trees, helping to re-stabilize otherwise steep erosive sediment pathways to creeks or else are hydrologically connected, requiring careful decommissioning and re-contouring. Neotropical songbirds were detected in many sale units. The presence of Neotropical birds adapted to denser interior mixed conifer forest with multilayered canopy indicates the need for this habitat.

The Farley Project FEIS states that the purposes of and needs for the selection action alternative are 1) make money from the sale of commercial timber, 2) restore historic stand structure and 3) promote resilience to large scale disturbance and long-term resource sustainability. The selected alternative authorizes extensive commercial logging. The other action alternatives all propose the same general types of prescriptions with varied levels of logging.

Notice is hereby given pursuant to 36 C.F.R. § 215 that the below listed groups hereby appeal the Record of Decision (ROD) to implement the Farley Project and associated timber sales and ground disturbing activities in the North Fork John Day Ranger District, Umatilla National Forest. Verification of the identity of appellants is available upon request.

This appeal is submitted by and on behalf of:

League of Wilderness Defenders Blue Mountains Biodiversity Project ("BMBP") Karen Coulter, Director 27803 Williams Lane Fossil, Oregon 97830 (541) 468-2028 office (541) 385-9167 voice mail	Oregon Chapter Sierra Club Asante Riverwind, Eastern Oregon Forest Organizer P.O. Box 5534 Bend, Oregon 97708 (541) 322-4065 office asante.riverwind@sierraclub.org

The Appellants believe that Acting District Ranger Kristy Grove's decision set forth in the Record of Decision is in error and not in accordance with the legal requirements of the Administrative Procedures Act (APA), 5 U.S.C. §§ 551–559, 701–706, 1305, 3105, 3344, 4301, 5335, 5372, 7521 (1994 & Supp. IV 1998); the Clean Water Act (CWA) Federal Water Pollution Control Act, 33 U.S.C. §§ 1251–1387 (1994 & Supp. III 1997); the Endangered Species Act (ESA) of 1973, 16 U.S.C. §§ 1531-1544 (1994); the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. §§ 4321–4347d (1994 & Supp. III 1997); the National Forest Management Act (NFMA) of 1976, 16 U.S.C. §§ 472a, 521b, 1600, 1611–1614 (1994 & Supp. III 1997) (amending Forest and Rangeland Renewable Resources Planning Act of 1974, Pub. L. No. 93-378, 88 Stat. 476); the Migratory Bird Treaty Act (MBTA), 16 U.S.C. §§ 703—712 (1994); and the implementing regulations for these statutes. The proposed project also violates the Umatilla National Forest Land and Resource Management Plan (Umatilla LRMP) as amended by the Regional Forester's "Eastside Screens."

III. Appellants' Interests.

The League of Wilderness Defenders - Blue Mountains Biodiversity Project ("BMBP") and Oregon Chapter Sierra Club ("SC") are each separate organizations with different members, supporters and volunteers (each an "Appellant" collectively the "Appellants"). Both Appellants have specific and unique interests in this project and they have previously expressed their interest in this specific project, and both of them have standing to appeal this decision according to 36 CFR § 215.11 (a). The Appellants interests and that of their members and supports that live, work and recreate in and around these lands will be adversely affected by this timber sale project. Appellants' members and volunteers regularly use and enjoy the Umatilla National Forest including the Farley project area, for recreational, educational, aesthetic and other purposes. The value of those activities will be irreparably damaged by the planned logging, road construction, and related actions of this project. The appellant groups have a long-standing interest in the sound management of this area, and the right to request agency compliance with applicable environmental laws.

The Appellants have participated throughout the public NEPA process for the Farley Project. Our organizations reviewed the initial project notice and submitted scoping comments; and reviewed and submitted substantial comments on the draft

Environmental Impact Statement ("EIS") prepared for the Farley Project. The Appellants sent field representatives to discuss the project with agency planning staff and conducted independent field trips and surveys throughout the project area and surrounding areas. The Appellants representatives hiked the areas, survey it and photograph the project area conditions during the development of the Farley Project.

Appellant League of Wilderness Defenders - Blue Mountains Biodiversity Project ("BMBP") has many supporters, members and committed volunteers that live in the Pacific Northwest. The BMBP members, supporters and dedicated volunteers regularly use the public lands in and around the Umatilla National Forest including the lands in and around the Farley project area. They enjoy the area for hiking, ecological study, watching wildlife, viewing forest native botanical diversity, and avian species study. The Farley project threatens to degrade the ecological integrity, native forest species habitat viability, salmonid watersystem habitat and water quality, and natural recreational quality of the greater project area, including adjoining wilderness, wild and scenic waters, and salmonid waterways. These changes irreparably harm the interests of Appellant BMBP as an organization and on behalf of its members, volunteers and supporters.

Appellant Sierra Club represents approximately 20,000 members throughout Oregon, including over 1,000 Juniper Group members throughout central and eastern Oregon. Sierra Club members live, work and play in these public forest lands and enjoy the wilderness and wildlife in them. Sierra Club members regularly enjoy hiking, camping, birding, wildlife watching, recreation and ecological study within the forests and rivers in and around the location of the Farley Project area. The Sierra Club members, and their ability to continue to enjoy and utilize the Farley Project and adjoining wilderness and wild and scenic river areas would be irreparably harmed if the Farley Project FEIS and Record of Decision are implemented.

The Farley Project threatens significant adverse impacts to the area's forests, ecological integrity, waterways, wildlife, aquatic species, and native plants and soil communities, and would likely increase the risk of severe fires in and around the greater project area. For the reason set forth in this appeal, Appellants request the agency withdraw and/or significantly modify the Farley Project so as to bring it into compliance with this nation's environmental policy laws and requisite scientific integrity.

IV. Appellants Requested Relief.

Appellants request the Forest Service to withdraw the Final Environmental Impact Statement and Record of Decision and, if it appears feasible and prudent, the Forest Service should modify the FEIS to address the objections presented herein and ensure consistency with the National Environmental Policy Act NEPA), National Forest Management Act (NFMA), the Endangered Species Act (ESA), the Clean Water Act (CWA), the Migratory Bird Treaty Act (MBTA), the Administrative Procedures Act (APA), and these statutes' implementing regulations, and the Umatilla National Forest Land and Resource Management Plan (DLRMP) as amended by the Regional Forster's "Eastside Screens" Directive, the Interior Columbia Basin Eastside Ecosystem

Management Project scientific recommendations, and the March 9th, 2009 Scientific Integrity Memorandum issued by President Barack H. Obama.

The Appellants are ready, willing and able to meet with Forest Service officials to discuss this further.

V. Appellants Request a Stay in the Interim.

In accordance with 36 CFR 215.10(b) all implementation of this project must cease until 15 days after the appeal is decided.

VI. Statement of Reasons for the Appeal.

1. Overview of Issues.

The Farley Project does not meet the applicable legal requirements of the National Environmental Policy Act ("NEPA") and the Forest Service's failure to disclose information previously requested under the Freedom of Information Act makes it impossible to discern whether the project complies with the applicable National Forest Management Act ("NFMA") standards or the requirements of the Endangered Species Act ("ESA")

Specifically, the Forest Service failed to produce the final specialist and other reports associated with the Farley project that the Appellants requested under the Freedom of Information Act. Appellants are hamstrung in their ability to appeal the project without this information and the Forest Service, therefore, cannot rely upon this information to support its NEPA analysis and conclusions about the project since it was unwilling and/or unable to provide information readily to the public. Indeed, to comply with the public disclosure requirements of NEPA, the Forest Service must make these materials available to the public along with its NEPA documents at every stage of the NEPA process or forego relying upon them to support its conclusions.

The Farley project as described in the FEIS will harm the environment in a number of significant ways that the Forest Service has not disclosed in the FEIS. The FEIS for the Farley project, including the response to comments, the Record of Decision and associated documents, provide a lop-sided and incredible presentation of the issues. The FEIS does not meet legal muster for at least the following reasons:

- The FEIS does not present the readily available data and information on carbon, climatic changes and vegetation trends and these data and information are central to the purpose and need.
- The FEIS does not present any science to support the proposed logging in mixed conifer, mixed fire severity forest ecosystems for "resiliency" or "fuels reduction" rationales.
- The FEIS states the goal is to promote the return of historic conditions, which included far more mature and old growth forests, but proposes to log many of

the larger, more fire-resistant trees in moderate- to higher-elevation forests which need to be kept to actually restore more resilient conditions.

- The FEIS does not disclose both direct effects, which along with widespread cumulative impacts from past, recent, and ongoing logging projects throughout the forest, need to be assessed at a landscape-scale to provide any meaningful assessment of the relationship of these proposed "treatments" to accomplish the purpose and need.
- The FEIS proposes logging projects that include road building, landing building, pile burning, wet haul and other related management in higher-elevation remote interior roadless area forests on lands that are set aside for fish recovery without adequately considering the carbon balance from no action, which includes wildfire.
- The FEIS does not disclose the full range of scientific controversy and research recommendations pertinent to the following issues:
    - Plant association groups
    - Water systems containing inland native trout and salmonids
    - Listed and imperiled species of concern
    - Moist mixed severity fire patterns at moderate to higher elevations
    - Direct and cumulative road density and fragmentation impacts
    - Forest soil communities and hydrological functioning
- The FEIS fails to disclose fully disclose the costs and benefits of the alternatives set forth in the FEIS using the readily available scientific evidence.
- The FEIS fails to disclose the carbon balance from fire versus the proposed action alternative. Readily available scientific data and studies show that local climatic change in naturally disturbed forests releases less carbon over time than logged forests. The Farley Project will likely result in the loss of carbon sequestration capacity in both the short and long-term from the impacts that the proposed action alternative will have on both the forests and the soils.
- The FEIS fails to sufficiently address significant synergistic cumulative impacts from past and ongoing sequential logging projects; from ongoing livestock grazing; from high road densities that exceed wildlife thresholds and LRMP standards; and from growing use of two- and four-wheeled motorized vehicles (Off Highway Vehicles) and the persistent negative impacts that the use of these vehicles are currently having within the project area and across the District.
- The FEIS fails to protect ecologically foundational forest soil communities and soil hydrological functioning; and protect native botanical species biodiversity and abundance; utilizing instead extensive ground damaging heavy logging machinery, widespread burning, and additionally failing to prohibit livestock grazing in logging and burning impacted areas for five to ten years post project as the minimum rest period recommended by scientific research.
- The FEIS does not provide assurances that the agency will reasonably protect Oregon State 303(d) listed and other critically important salmonid spawning

watersystems, salmonid populations, and aquatic habitat from direct, indirect, and cumulative harm and degradation due to project actions.

- The FEIS Response to Comments improperly denies the central purpose and need for the project which it uses to justify the project. The planning staff cannot dodge the lack of scientific support for the claim that the project will mitigate or increase resilience to fires and insect outbreaks by then claiming that commercial logging is the only purpose and need. The statements in the FEIS run counter to this illogical and incredible response.
- The FEIS does not adequately address impacts to terrestrial and aquatic threatened, endangered, and sensitive species including wolves, lynx, and salmonid species.
- The FEIS for the Farley Project contains a purpose and need statement but it does not provide the scientific support to back it up.
- The FEIS does not disclose how it will modify the chances that fire, insects, and disease will negatively alter the mid- to high-elevation upland forests. These forests are not outside their historical pre-fire suppression conditions for species composition (including hardwood species), structural diversity, stocking densities, and fuel loads.
- The Farley Project fails the expert, reasonableness, accuracy, and scientific requirements of the NEPA, recently reaffirmed in President Obama's March 9th, 2009 Scientific Integrity Memorandum (see below). Overall the Farley Project significantly fails to incorporate the reasonable recommendations of credible environmental scientific research and the Forest Plan guidance that requires the Forest Service to manage to return more all mature and old trees and forest ecological structure.

In sum, the Forest Service has conflated the need for ecologically limited thinning actions, which are needed in certain low severity frequent fire ponderosa pine forest systems that are generally found at lower elevations. The Forest Service has conflated this need into a reason to enter into mixed conifer and mixed fire severity systems and is proposing to log, build landings, build roads and pile burn the land. This land has been set aside to protect and restore inland native trout and salmonid populations. The goal for these lands is the recovery of the habitat and its ongoing protection which will hopefully lead to the recovery of the many listed species and species of concern throughout the project area. The implementation of the Farley Project will significantly harm the areas remaining forest environments and the wildlife species that depend on these lands. The extent of planned logging activities either far exceeds a more limited small diameter tree and brush thinning project which may be scientifically capable of achieving reduced risk of uncharacteristic fires around areas of higher concern. The logging of mature trees that are the future old growth, particularly inherently fire resistant trees like Western Larch, Douglas fir and other from moderate to higher elevation mixed conifer and sub-alpine forest habitat which may have far longer fire return intervals is not supported by the scientific literature. The project will use heavy machinery and there is extensive ongoing livestock grazing and there is no adequate plan to consider the impact of the machinery, the road building, the pile burning and the grazing as compared to natural disturbance.

2. The Farley Project FEIS Fails to Accurately Disclose and Assess Forest Conditions & the Impacts of the Selected Alternative.

The FEIS presents a limited analysis and inadequate disclosures that are largely based upon mythology and inaccurate assessments of current conditions. Appellants submit that the agency's project planners should more accurately fit their proposed prescriptions to the needs of the site-specific conditions and variable ecological patterns of this area. Appellants respectfully submit that where natural conditions plainly evidence higher densities and greater structural stand complexity than formulas may recommend, it is not the forests that are to be re-made to fit contrived human formulas, but rather the formulas themselves that must be revised to better match natural forest conditions, ecological patterns, and structural complexity.

Forests are far more than trees. Forest ecosystems are homes for a wealth of interwoven biodiversity, including numerous wildlife avian, aquatic, botanical, fungal, and soil community species. Forest ecosystems are the sources of abundant clear flowing waters. Forests are extensive banks of carbon sequestration critically important to helping offset and recover from the exponentially growing harms of climate change. The planned logging actions of the Farley Project fail to comport with the complex actual conditions of the forest area itself, with credible ecological science recommendations, with the nation's federal environmental policy laws, and with the imperative need to protectively retain critically important carbon sequestration capabilities and functioning of our forest ecosystems.

3. Farley Survey Results.

Many of the forests targeted for treatment in the Farley project are moist, cool mixed conifer with lush, wet meadows with perfect conditions for large ungulates. Field visits confirmed signs of elk. In some old growth counts in the area, Engleman Spruce is the number one old growth species. The presence of this species is indicative of a significant abundance of moisture.

There are also many mature and old growth subalpine fir in the area. The presence of these trees indicates cold, moist, subalpine habitat. At the time of project area surveys in June, the snow pack had recently withdrawn with a few patches still remaining. A large hailstorm dropped significant moisture at the end of the Appellants second day of June 2009 surveys.

The forb and shrub layer includes many moisture and shade -loving plants; including four plant community types Twin flower, Prince's Pine, Grouse Huckleberry and Big- Leaf Huckleberry. Moisture and shade- loving forbs present in the area include Queen's Cup Bead Lily, Calypso Orchid, Mt. Lady's Slipper, Spotted Coral Root, Thimbleberry, and mosses.

The elevation of the project area is high above the valley floor. Relatively rare species in the area include Columbia White Tail Deer, and there are probably wolves in the area.

This area also evidences the impacts of past logging. Although these units have less Engleman Spruce, units do include mature Engleman Spruce and old growth Grand and Douglas fir.

Many of the units have active Pileated woodpecker use including fresh foraging, nest holes, and sightings. Most of the units are suitable habitat for pine martens. Old growth Ponderosa pine are largely limited to the fringes of units and edges of meadows; evidencing that this is the natural historical condition. Similarly, old growth Douglas fir is also confined to the edges of sale units. Mixed conifer in the interior of units includes Grand fir, Engleman spruce, Western larch and Lodge Pole pine.

These areas appear to be within the historic range of variability for higher elevation, warm to cool mixed conifer that would be naturally susceptible to mixed severity to high severity fire with longer fire return intervals. Evidence of past fire scars exist in the project area. Fire intervals could be expected to be as much as 200 to 300 years based on tree species composition and moist plant associations. The entire project area contains the headwaters for numerous tributaries to Desolation Creek and the upper headwaters of the North Fork John Day River.

During recent surveys (survey sheets were provided with Appellants comments), there were numerous sightings of Snowshoe Hare throughout the project area, along with other indications of the area being suitable Lynx habitat.

The area is also a large refuge for numerous neo-tropical songbirds including Western Tanager, McGillivray's Warbler, Yellow Warbler, Solitary Vireo, Ruby Crowned Kinglet, Chipping Sparrows and Swainson's Thrush. Other uncommon species seen or heard included Northern Pygmy Owl and Columbian Ground Squirrel. Among the wildlife species seen in the project area, Pileated woodpeckers are a regional indicator species of management concern; many forest-dependent neo-tropical songbirds are experiencing habitat loss and population declines; Gray wolves are listed as endangered, with the only wolf pack in the Oregon/ Washington area located immediately adjacent to and utilizing the project area as part of their territory; White-tail Columbian deer are a listed species; and the project is within the only area with moose in Oregon. The greater project area is prime habitat for the Threatened-listed Canada lynx. The area is also headwaters for the John Day River, with tributary creeks that contain federally listed aquatic species.

Project units were individual-tree marked to cut or leave-tree marked. Units marked to cut showed a tendency for commercial logging "prescriptions" that do not thin the forest from below, but instead focus on large healthy mature trees.

Based on Appellants' surveys, a significantly smaller diameter limit for any conifer thinning, and limited strategic management actions pertinent to plant association group and varied natural fire patterns are appropriate for retaining carbon sequestration, mature trees for replacement old growth (and for replacement larger snags and down wood) and for needed wildlife habitat for Pileated woodpeckers, Northern goshawk, elk, Neotropical songbirds, and other interior forest and mature forest-dependent species. The analysis within the FEIS, and range of developed alternatives, failed to reasonably disclose and incorporate credible scientific recommendations capable of better achieving the stated ecological purpose and need goals for this project, in violation of the clear requirements of the NEPA. The FEIS failed to accurately and sufficiently disclose the site-specific conditions of the project area forests, also violating the NEPA. The decision as such must be withdrawn and a legally compliant NEPA EIS process conducted for this project.

4. The FEIS Fails to Disclose Readily Available Science That Counters the Claim that the Chosen Alternative Will Meet the Stated Purpose and Need.

Appellants submit that the Farley FEIS and Record of Decision fails to adequately address and incorporate issues of scientific controversy and applicability, including critically important ecological objectives and concerns set forth in earlier comments that Appellants submitted regarding the Farley Project. (See Exhibit A, Solutions to Farley Project).

Environmental law requires public lands management project be in accord with credible scientific recommendations applicable to accurate site-specific conditions, including those appropriate to species of concern habitat needs, salmonid watersystem recovery, and site-specific plant association groups. Indeed, the requirements of the NEPA mandate projects such as Farley are well-founded on expert advice, scientific research, and accurate site-specific conditions. The Farley Project FEIS and Record of Decision significantly fail the requirements of a legally compliant forest resiliency and fire risk/severity reduction project.

The FEIS claims the purpose of this project is to improve health, vigor, and resilience to disturbances like fire, insects, and disease in upland forests that are outside their historical pre-fire suppression conditions for species composition (including hardwood species), structural diversity, stocking densities, and fuel loads.

This project is very similar to a number of other previous Umatilla National Forest and Pacific Northwest region timber sale projects across Oregon's eastside forests. To varying degrees throughout many of these, including Farley, project markings and design on the ground are based upon non-site-specific agency management formulas rather than credible scientific research and actual HRV conditions and composition in unit areas. To meet the legally requirements for both site-specific accuracy and science, marking in project units must match actual HRV conditions.

Historic stand densities, including old and mature trees per acre can be ascertained fairly accurately by noting existing old growth trees, stumps from logged trees, large decomposing logs from blow downs, and mature size trees that would have been young seedlings or black bark trees 80 to 120 years ago. Depressions in the forest floor from old growth trees that have disappeared – due to fires, decomposition, past logging, or firewood removal, must also be included in accurately approximating per acre stand density HRV. Similarly, stand composition and structural HRV can be ascertained by assessing the mature and old characteristic species present, and those present in large old stumps and fallen logs, as well as associated plant species, elevation, aspect, and moisture patterns. The FEIS needs to match natural conditions and applicable scientific recommendations.

In reviewing the project's purpose and need assumptions, there are major omissions in supporting science. Contemporary scientific research indicates that moisture availability, including soil hydrology, watershed flows, dry season moisture retention, and stand moisture availability and fluctuation are significant factors in increasing the health, vigor, sustainability, growth, and fire resistance of forest stands. Over a century of logging, grazing, and road building have significantly altered soil hydrology, water flows, moisture retention, stand structure and fire severity patterns. Scientific research indicates that the purpose and need goals of the project can best be met by effectively addressing these issues, rather than by compounding existing ecological problems with more ground-based soil damaging, forest and watershed harming commercial logging.

The FEIS's presumptive and limited analysis failed to address many important issues raised during the comment period. For example, the FEIS did not consider the hydrological impacts of water diversions for and grazing by livestock. The FEIS did not consider how the soils have been and would continue to be impaired from past and ongoing management practices (logging, grazing). The FEIS did not consider how it will restore soil moisture availability and retention towards HRV conditions.

The analysis for Farley Project failed to address the full range of environmental impacts, including direct and cumulative impacts that are significant and growing in the area, with the implementation of other management projects across the District and elsewhere in the Umatilla National Forest.

Impacts to hiding and thermal winter range cover for native ungulates including elk, deer, and possibly moose are significant issues, compounded by cumulative impacts from previous and ongoing management actions, including grazing. The FEIS and ROD failed to adequately address and accurately disclose harmful direct and cumulative impacts to salmonid and other aquatic species habitat. Impacts to wildlife species, including marten habitat, and dispersal and foraging habitat and cover for far-ranging species such as lynx, wolverine, and wolves have not been accurately or adequately addressed. Impacts to neotropical migrant and native birds, goshawks and other raptors, cavity nesters, as well as avian mammals such as bats, and canopy dwelling mammals including flying squirrels were not sufficiently nor accurately disclosed and assessed.

The FEIS and ROD planned commercial logging (through various thinning prescriptions) fails to be based upon or incorporate the credible range of ecologically sound restoration science. Substantiating scientific research was largely taken out of context and does not comport with the planned actions. Additionally, the FEIS fails to disclose and assess research that contradicts or advises against agency logging plans. The FEIS fails to comply with NEPA scientific accuracy requirements, misusing out-of-context and arbitrarily selected scientific recommendations as blanket formulas, instead of referring to these as guidance, and adjusting them to match accurate site-specific HRV conditions and ecological restoration objectives in the project unit areas.

The FEIS fails to accurately disclose the harmful ecological impacts of its so-called "temporary" new road construction. The FEIS fails to adequately address the excessive harmful extent of roads in the area already. The project failed to sufficiently address removing excessive and resource damaging roads throughout the area, bringing project road density to within scientific recommendations for wildlife and environmental viability, as well as LRMP standards. The project failed to disclose if LRMP road density standards comport with recent scientific recommendations related to wildlife road density thresholds for the area's species of concern, or whether these need adjustment to incorporate relevant new research. In particular, as wolves are a listed species known to be returning to the area, and as road density levels severely impact their territorial and survival viability, planning to construct additional roads and significantly reduce hiding cover is in direct contravention to Oregon State wolf plan recovery objectives. This issue was not adequately addressed within the FEIS. Similarly, the FEIS failed to adequately address the full range of harmful impacts from project implementation road use, and failed to ensure project action provisions can effectively prevent adverse impacts to the area's aquatic systems, wildlife species, and other natural resource concerns from project design, road construction, maintenance, duration of implementation, and road use.

The FEIS failed to provide action alternatives that effectively begin recovery of the area's waterways that are 303(d) listed. The project as planned will further adversely impact these watersystems. Analysis should have included action plans to effectively begin to restore these and other impaired waterways.

The Farley Project FEIS and ROD propose to engage in ecologically harmful and legally untenable timber sale rather than actually meeting the purported purpose and need of the project.

5. Natural Forests and "Hazardous Fuels" Reduction.

Forests are not "hazardous fuels" in the plain sense of those words. Scientifically speaking, this term is a misnomer for describing natural components of forest ecosystems where fire is an integral and recurrent component. Perhaps the term "hazardous fuels" is an apt description for a can of petrochemicals, incendiaries used to start fires or, perhaps, a large slash or debris pile created by management activities.

The Forest Service claims to be restoring forest resiliency and reducing the risk of severe fires with this project. Dense growing forests stands, woody debris, brush, grasses, dry downed branches and dead lower limbs are not in themselves "hazardous." Forests of eastern and central Oregon evolved with, depend upon, and are sculpted by fire. Instead, human-created changes in forest structure, hydrology, and fire cycle seasonal patterns largely the result of commercial logging, road building, and livestock grazing, and in some limited property boundary locations - the proximity of human residences – are what give substance to societal perceptions of "increased" fire risk.

Some forest areas may warrant strategically placed restoration actions to beneficially help restore forest stand structure more rapidly. However, the extent to which a commercial timber outcome may be derived from these actions is concomitantly limited. There are areas where young smaller diameter fire-susceptible trees have grown in densely in the aftermath of fire suppression and areas where past logging has altered stand composition. However, commercial logging of trees with inherently fire resistant characteristics above approximately 10" to 14" diameter at breast height (dbh) is without support in the scientific literature as a legitimate component of project designed to restore historic stand composition.

After commercial logging, the best evidence shows that logged trees are quickly replaced within 10 years or less by more fire prone brush, grasses, and small diameter tree seedlings. Commercial logging has been shown in a number of cited scientific studies to actually increase fire risk and fuel loads. The FEIS for this project fails to accurately disclose or adequately address the scientific research and controversy which counsels against the type of activities planned in the Farley project area.

Similarly, insects including bark beetles are naturally inherent essential components of forest ecosystems. Forests accomplish their own natural thinning by innumerable natural processes, including bark beetles, tussock moths, and other invertebrates, as well as a host of forest pathogens from root rots to slow-acting, semi-symbiotic mistletoe, which may weaken trees and increase their susceptibility to other pathogens – but in itself rarely kills. *See* Logging to Control Insects, Scott Hoffman Black, 2005; Declaration of Richard H. Waring dated September 10, 2009 (attached hereto).

The analysis does not discuss how this project will facilitate a return of the area's forests to a range of natural variability that is self-resilient over the long-term of time. Thinning itself has been scientifically shown to result in increased levels of small diameter trees and brush, as well as slash debris. Nature, always one to fill an opening, soon replaces removed trees with young tree seedlings as well as shrubs, grasses, invasive exotic vegetation, and brush.

The Forest Service states that this project will reduce fire risk and restore forest resiliency but the agency does not fairly consider the importance of protecting soils to accomplishing these project goals. Soil resiliency, moisture retention, and subsurface soil microbial community conditions and viability play a foundational role in determining

overall forest resiliency and reduced susceptibility to severe fires. Current plans that permit the use of heavy logging machinery for thinning must be changed, with provisions mandating the use of light-on-the-land machinery instead. It is inconsistent with the regional achievement of project goals to require slash treatment machines to have low ground pressure on some similar management projects in eastside forests, but not also require similar low-ground impacts of logging skidders, tractors, and other machinery on this project.

The answer is not to remove light-on-the-land slash machinery provisions elsewhere, but instead to utilize similar provisions for thinning machinery in this project. NEPA requires scientific accuracy and professional expertise in agency projects. The disparate inconsistent analysis, methodology, and focused awareness displayed by the Forest Service across the region on its many varied approaches to "fuels reduction" projects evidences a systemic failure to incorporate the best available science and ecologically effective methods consistently in its project proposals and decisions.

Restoration of the area's 303(d) Oregon State listed salmonid waterways should have been a requisite strong part of this project. Localized climatic fluctuation cycles, hydrology, and water availability, far more than thinning, have greater influence on reducing fire risks and increasing forest resiliency. Action alternatives in fuels reduction projects failed to responsibly include removing or significantly reducing livestock grazing – especially in logging and burning disturbed post-project areas. The FEIS failed to identify and reduce sedimentation sources, failed to retain existing riparian vegetation and plant additional riparian shading vegetation (especially within upland seasonal tributaries), failed to stabilize slopes above salmonid streams, and failed to provide for the restoration as possible of hydrological flow patterns and levels, and improving stream bed cobble habitat for aquatic species, among other priority restoration needs the FEIS failed to incorporate or sufficiently address.

Pile burning as planned is in contravention to ecological objectives. Even if the unless piles are kept small, it is difficult to burn the fires at low-intensity or for a short duration. *See* Declaration of Jonathan J. Rhodes (attached hereto) Burning large piles sterilizes forest soils beneath them, taking many years for affected areas to begin to recover. The FEIS failed to sufficiently address the harmful impacts of the planned burning of large slash piles – especially if economic trends do not allow the removal of logging generated slash. The FEIS also failed to address the increased fire risk to the area from thinning and logging slash and debris left in the forest post-project, or to provide for a reasonable removal timeline that ensures such slash is addressed within the short timeline this project would have limited affect on reducing fuels and fire risk. Without firm removal timeline provisions, especially given the current limitations of wood fiber economics, the project will likely significantly increase the risk of severe fire in the area far longer than the limited ten year period where – within frequent fire Plant Association Groups (PAGs) only – the project may otherwise have limited fuel and fire risk reduction benefit.

Overall the Farley FEIS and ROD repeat the same scientifically unsupported and ecologically harmful logging-driven formulas being utilized by the Forest Service for timber target driven projects across much of Oregon's eastside forests. As with similar harmful logging projects, the extent of environmental harms that would result from the Farley Project ROD, and the extent of legal non-compliance of this project's NEPA analysis necessitate this appeal. Appellants request that the agency abide by the laws of this nation, the site-specific historical conditions of the area's forests, and legitimate scientifically supported ecologically beneficial management recommendations; and responsibly withdraw the FEIS and ROD for the Farley Project in this remote mixed conifer forest area.

6. Insufficient Analysis of the Impacts on Undeveloped Areas.

Even in uninventoried roadless areas, NEPA requires the FS to consider the environmental impacts of a proposed project because logging in roadless areas is so environmentally destructive that its impacts are far beyond the threshold for significant. First, the USFS is required to analyze the attributes of roadless areas, such as water resources, soils, wildlife habitat, and recreation opportunities. *Smith v. U.S. Forest Service*, 33 F.3d 1072, 1078 (9th Cir. 1994). Second, the USFS is required to discuss a project's impacts on areas of "sufficient size" for future wilderness designation. *Lands Council*, 529 F.3d at 1231, citing 16 U.S.C. § 1131(c).

In *Lands Council*, the FS determined that a logging project did not alter the undeveloped character of the land because there were no areas that met the minimum 5,000 acres wilderness requirement. *Id*. Rejecting this argument, the 9th Circuit held the FS violated NEPA because the agency failed to aggregate inventoried and uninventoried roadless areas. *Id*. The FS had only provided a map and other data describing the logging location, which the 9th Circuit determined would only let the public discover that the roadless areas would be significantly affected. *Id*. at 1232. Rather, the FS was required to disclose that significant roadless areas would be affected and analyze those environment effects. Id. In the FS's disclosure and analysis, the agency was required to disclose the unique environmental benefits provided by these areas and the impacts that the project would have on those qualities. See, e.g., *Sierra Club v, Austin*, 82 Fed. Appx. 570, 573 (9th Cir. 2003)

Additionally, in the recent case of *ONDA v. BLM*, the Ninth Circuit held that NEPA requires analysis of wilderness characteristics, even if the affected area is not a designated Wilderness Study Area (WSA). *Oregon Natural Desert Association v. Bureau of Land Management*, 531 F.3d 1114, 1132 (9th Cir. 2008). This same logic applies to the FS, which is required by NEPA to evaluate the affects to the undeveloped characteristics of an area even if the area is not an inventoried roadless area. The FEIS employs only cursory analysis of the effects to these uninventoried roadless areas, focusing on the reduced appearance or claimed lack of undeveloped characteristics. Finally, in *Foundation for North American Wild Sheep v. U.S. Dept. of Agr.*, 681 F.2d 1172 (9th Cir 1982), the Ninth Circuit held that the FS was required to prepare an EIS to analyze the effects to a sensitive species before it could allow road construction in a UA.

As in Wild Sheep, the FS inadequately analyzes impacts to sensitive species from development in UAs.

As noted above, the Farley Project would log in undeveloped and unroaded areas contiguous with and clearly ecologically part of the larger network of inventoried roadless and wilderness areas. *See* maps attached and previously providing by Oregon Wild. Though uninventoried roadless areas are included among the project logging units, the FEIS and ROD fail to disclose how many acres these area, where they are located, their ecological site-specific conditions, or to adequately address logging and management action impacts. Along with this appeal, Appellants provide two maps of the Farley Project units which show the location of Wilderness and IRA areas that are proximate to the Farley Project area and important parts of larger connectivity corridors that run through the Farley Project area. These areas link adjacent Wilderness with other Inventoried Roadless Areas. The FEIS and ROD must be withdrawn, and an EIS conducted that sufficiently acknowledges and addresses these critically important ecological issues.

7. Insufficient Scientific Support for the Stated Purpose and Need.

The agency may not define the purpose and need of a project so narrowly that the proposed action is the only possible course of action. *EPIC v. USFS*, D.C. No. CV-04-01705-GEB (9th Cir. 2006). In the *EPIC* case, the Ninth Circuit found that the purpose and need of a timber sale project was so narrow that it was impermissible. The proposed action was the only possible course of action to fulfill the purpose and need, so there was no real analysis of alternatives.

The purpose and need of the Farley timber sale is too narrow. The Forest Service has limited possible actions to only scientifically controversial and largely insupportable logging actions that are incongruous with the project's stated ecological objectives. The Forest Service narrows their objectives and analysis in the FEIS, failing to sufficiently disclose and address extensive cumulative impacts issues from past and recent projects, failing to accurately disclose or address the harmful logging impacts of this proposed project, and failing to effectively address a range of restoration actions that encourage and restore forest resiliency and old growth forest habitat.

Instead the FEIS focuses almost exclusively on logging actions to accomplish its stated objectives. Given the FEIS's stated purpose above, the only possible action that could fulfill the need to provide logs and wood fiber for industry is commercial logging. Because of the narrow purpose and need, the Forest Service only analyzes virtually identical action alternatives based primarily on commercial logging.

The Record of Decision claims that 7 alternatives were considered and 5 were given more careful study. However, the four action alternatives are virtually identical in premise and methodology, both featuring widespread commercial logging across many of the project area units. The responsible official selected the chosen alternative because it maximizes the economic benefits to the regional and local economy.

The FEIS merely briefly paraphrases public comments requesting the development of scientifically sound reasonable alternatives and does not provide meaningful responses to the comments. The FEIS does not evince real consideration of these alternatives. The FEIS fails to reasonably address the scientific controversy surrounding the developed alternatives and their lack of scientific support. The FEIS similarly fails to provide the decision-maker and the public with a comparative assessment of supportive scientific research for the undeveloped alternatives and a range of other feasible alternatives which were never considered at all.

The FEIS does not even present a possible alternative employing a reasonable diameter limit. The FEIS dismisses this option by stating that this would not reduce stand density levels to HRV. However, the FEIS fails to provide a table to demonstrate at above what mean diameter level stand density evidences being within or near HRV levels. Surveys of the project area indicate that historic stand composition in much of the project follows typical dense moist forest complex structural conditions. Where there exists site-specific evidence of drier more open forest conditions, surveys generally indicate that trees above 12" to 16" do not contribute to excess stand density. Instead, excess density – where ecologically applicable to area mixed conifer and moist forest PAGs at all – is largely comprised of trees from seedling to 12"-14" diameter. As such, a scientifically supported reasonable alternative would have been to implement a maximum 14" to at most 16" diameter limit in appropriate PAG areas as a scientifically feasible developed alternative for consideration.

By dismissing this kind of alternative without any thoughtful or meaningful analysis, the agency fails to base their developed alternatives on the accurate site-specific conditions of the area, and the recommendations of credible scientific research. In *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810, 815, rev'd in part, 490 U.S. 332 (1989) (internal citations omitted) the Court determined that the EIS was inadequate because it failed to examine all reasonable alternatives. The Court held that "the range of alternatives considered must be sufficient to permit a reasoned choice." Here, beyond the statutorily required "no action alternative," only four essentially identically premised and nearly identical logging alternatives are developed for consideration. These logging alternatives differ only by extent and focus of acres logged. They do not differ in substance concerning the action methods, scientifically controversial premise, logging impacts, changes to forest stand structure and wildlife habitat, forest plan amendments, mitigations, or economic timber volume objectives. In so doing, the Forest Service completely failed to develop and consider other reasonable action alternatives in violation of NEPA.

In *Muckelshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, fn. 7 (9th Cir. 1999) the Court held that the purpose and need cannot be so narrow that only one type of action alternative will work. In this case, the Forest Service has drawn its purpose and need too narrowly, apparently in an attempt to limit the alternatives that will serve the purpose. As a result of the narrow purpose and need, the Forest Service undermines the NEPA process and does not give serious consideration to the no action alternative, or to

the development of forest plan legally-compliant and scientifically-based restoration action alternatives.

8. The FEIS is Premised On Erroneous and Scientifically Controversial Management Assumptions and Actions Which are Incapable of Meeting the Stated Goals and Objectives of the Project.

While there is limited scientific support for the removal of small diameter trees and flash fuels in frequent fire-interval low elevation ponderosa pine forests, there is significant scientific controversy and strong recommendations against logging-thinning mixed conifer, mixed fire-severity, and moist forest ecosystems to improve health, vigor, and resilience to fire, insects, and disease in upland forests that are outside their historical pre-fire suppression conditions for species composition, including hardwood species, structural diversity, stocking densities, and fuel loads. (Wilmer and Aplet, Wildland Fire Challenge, 2003).

Indeed, the FEIS and ROD ignore and fail to disclose and address the majority of credible peer-reviewed scientific research studies that clearly indicate the project's actions are incapable of achieving the stated ecological purposes quoted above. *See* Declaration of Jonathan J. Rhodes, Declaration of Richard H. Waring. Instead, scientific research has clearly documented that the proposed actions would harm forest resilience and ecological integrity, and increase the risk and extent of severe fires in the project area.

The agency's interpretations of scientifically controversial research addressing regional forest ecology is based upon the selective and contextually inappropriate misuse of a combination of limited scientific studies and agency assumptions. Although not stated in the FEIS, it appears that timber volume targets may be driving this project.

While there is emerging scientific consensus concerning pre-European settlement era forest stand compositions and varied historical fire patterns in the region, the Forest Service has largely misapplied scientific conjecture in this project's interpretation of "historic conditions" and in developing its planned actions within the planning area. The resulting project is a hodge-podge of only partially accurate historic stand assumptions mixed with erroneous and misapplied scientific interpretations. Consequently, the logging will result in far more ecological harm than benefit to the area's complex ponderosa pine, western larch, spruce, Douglas and grand fir, and lodgepole pine mixed conifer forest ecosystems and their dependent wildlife, native plant, and aquatic species.

Agency contentions regarding "historic forest stand conditions" are simplistic, inaccurate, and largely incapable of accurately representing area plant associations and forest conditions that occurred prior to human manipulation of the environment.

Forest stand "overstocking" is a term that applies to lower elevation frequent fire cycle forests, not mid and high elevation mixed conifer forests, mixed fire severity forests, and moist forests, which are naturally more structurally varied and dense. Due to

past logging in the area, what "overstocking" actually exists occurs only within dry ponderosa pine dominant stands; primarily among young understory trees that have little if any merchantable timber value. Significant portions of the project also contain areas with unnatural logging created openings, old logging skid trails, far too many resource damaging unmaintained logging created roads, and overall degraded forest ecosystem conditions due to a combination of past and ongoing management, including logging, road building, fire suppression, invasive plant introduction and spread, and livestock grazing, and OHV use and abuse is also a growing concern.

Past and recent logging projects have exacerbated current fire risk throughout the area by removing fire resistant old growth, mature, and maturing trees, leaving high levels of logging slash in piles and spread across the forest floors. Fire resistant trees removed by logging have and are being replaced relatively quickly with more fire prone vegetation including grasses, invasive plants, shrubs, forest vegetation, and small seedling and young trees.

As past high-grade logging removed many of the largest diameter trees, significantly altering the area forests, much of the project's forest stands are still in the process of natural recovery from past over-logging. Old, mature, and maturing trees, including many of those planned for logging removal, play an essential role in the ongoing natural recovery process of the area's forests. As many of the area's old growth and large mature trees have been removed during past logging, the area's remaining trees greater than 12" to 15" diameter provide essential forest stand structure for wildlife habitat viability and the long term ecological integrity and recovery of the area. Removing even more of the project area's inherently fire resistant maturing trees as planned would be in contravention to the recommendations of the majority of scientific research studies and to the purported ecological portions of the project's purpose (above).

As noted by scientific research, trees begin to exhibit fire resistant characteristics as they mature, with increased height of branches, thickening bark, vigorous growth, deepening roots, and greater moisture capacity retention. Varying somewhat by tree species and localized conditions, inherent effective fire resistance of growing trees begins to be attained between 5" to 10" diameter. Former Forest Service Chief Dombeck has been quoted as stating there is no valid rationale for removing trees greater than 12" diameter to meet fuels and fire risk reduction goals.

For example, recent analysis by the Deschutes National Forest on a similarly premised eastside forest project, the Sisters Area Fuels Reduction Project FEIS, confirmed that a 12" dbh cutting limit was capable of accomplishing fire risk reduction goals in the area's ponderosa pine forest mosaic spanning from complex old growth to younger even aged stands. Scientific research confirms that such fire severity reduction objectives are not feasible in mixed conifer stands, such as the majority of forest stands found in the Farley project area.

As noted herein, removing too much of an area's basically fire resistant maturing tree forest stand structure actually increases the risk of fire severity and extent of spread,

due to greater solar drying, higher wind speeds, and greater prevalence of fire prone brush, vegetation and small diameter trees that soon replaces the more fire-resistant shade-providing/moisture retaining trees removed. Additionally, logging slash and debris that remains in the forest increases the risk and extent of severe fires far above the pre-project implementation risks. Yet this alleged "fuels reduction" project fails to adequately disclose or address cumulative issues of logging slash from other past and current projects, as well as project generated "fuels" that currently exist or will exist post-project in the area. Removal and/or reduction of existent logging and thinning generated fuels where appropriate should have been effectively addressed by the FEIS, especially given the purported purpose and need for the project.

As planned, the project would further harm the ecological integrity of the area by its planned removal of far too many of the area's old and mature trees, including the scientifically insupportable logging in mid and high elevation mixed conifer forests, and the logging of inherently fire resistant mature and old growth trees. This kind of scientifically and ecologically unwarranted logging will seriously degrade existent wildlife habitat, jeopardizing the viability of forest-dependent species of concern throughout the greater project area.

The agency's premise that it can somehow improve upon the natural recovery processes that forests have undergone for millennia by authorizing thousands of acres of logging is scientifically controversial in mid- to high- elevation mixed conifer forests and largely insupportable when weighed in light of the full extent of credible peer reviewed scientific research

The Appellants raised issues regarding scientific controversy early on in the scoping process and again when the Appellants submitted comments on the FEIS. Appellants requested that these studies and recommendations be addressed and incorporated into the project documents. The agency must found its NEPA projects upon the best available science and expert advice and develop a full range of varied alternatives based upon pertinent science.

The Farley Project FEIS and ROD failure to disclose and address pertinent science, and develop a full range of credible scientifically supported alternatives, is similar in many respects to the Umatilla NF's North Fork John Day District's refusal to disclose and address science pertinent to burned forest ecosystems in its Big Tower Project in the late 1990's, where the timber sale was found by federal court to be in violation of federal environmental policy law in large part due to the agency's failure to disclose and address scientific ecological issues of the then relatively new Beschta Report. *Blue Mtns. Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir 1998). Similarly, the Farley Project violates NEPA federal environmental law regarding the USFS failure to disclose and address pertinent science specific to the forest types of the project area, their dependent wildlife species habitat needs, salmonid aquatic systems, and climate change and carbon sequestration of forests.

The agency may not arbitrarily selectively pick only among the limited scientific studies that appear to support its logging plans. It may not just merely list scientific studies, as if these were all incorporated or consulted. The analysis within the FEIS failed to disclose which studies were incorporated in developing its proposed actions, and failed to also disclose which studies recommend against such actions, providing the public and decision-maker with NEPA's requisite scientifically and meaningfully informed analysis on which to weigh the impacts, benefits and harms, and efficacy or lack thereof, of proposed agency actions.

The chosen alternatives must reasonably include a range of actions substantiated by the varied research, so the public and decision-maker can choose which actions may be most effective or desirable in the long-term in a given project area. The project however, only developed action "alternatives" which involved extensive commercial logging that differ only by the number of acres logged. The FEIS does not contain an action alternative that is based upon the preponderance of credible peer reviewed ecological science.

9. Failure to Insure Scientific Integrity of the Discussions and Analyses.

The NEPA regulations require the Forest Service to "insure the professional integrity, including scientific integrity, of the discussions and analyses" in the NEPA documents that it prepares. 40 C.F.R. § 1502.24. Furthermore, the Forest Service must disclose the extent to which the impact of the proposed action is scientifically controversial. See id. §§ 1508.27(b)(4), 1508.27(b)(5).

The project claims that it will reduce fuel loadings through mechanical fuels treatments by engaging in thousands of acres of commercial logging. However, the mechanical fuels treatments would actually degrade and destroy habitat in both the short and long-term. The planning area includes diverse stands of forest that are green, healthy and thriving. The project area is home to a diverse array of species, many of which depend upon complex interior forest. The Forest Service's decision "to improve health, vigor, and resilience" of forest wildlife habitat in the future by destroying wildlife habitat in the present fails to make ecological sense, and is scientifically insupportable.
The Forest Service never presents credible science showing that wildlife habitat and biodiversity is benefited in the future by destroying habitat in the present. To the Forest Service, the theoretical risks of fire, insects, and other disturbances are just as great as the actual impact of logging. Where is the science to support this hypothesis?

Simply misrepresenting scientific research out of context, utilizing inaccurate site-specific and HRV conditions, and merely listing science that largely – if read – clearly recommends against the planned logging, fails the legal requirements of the NEPA. The Forest Service's plan to protect forest habitat with mature, late, and old-structured stands and mature and large trees is to cut them down. The actual planned action is, then, inherently antithetical to its stated purpose.

Part of the stated purpose and need of the project is to meet the land designation for the area which is set aside as land that will provide for fish and wildlife habitat. However, the project does the exact opposite. The activities planned for this sale may cause both a short-term and a long-term degradation of suitable habitat. Area forest species of concern; including lynx, wolverine, wolves, salmonid species, goshawk, marten, pileated and three toed woodpeckers, neotropical and migrant native bird species, and others; require extensive connective forests with mature and late-successional characteristics, including large diameter trees and healthy functioning watersheds and water systems. (Lint, 2005) It is these forests that are most fire resistant, as they have moist interiors, a complex canopy, and are impenetrable to wind. (Rhodes, 2007 and others – see below) Commercial logging the area's mature and old fire resistant trees up to 21 inches in diameter threatens to irreparably degrade wildlife species of concern and listed-species habitat, including connectivity, and increase the risk of fire.

The Forest Service fails to address cumulative impacts properly, and fails to provide any science showing that destroying viable mature and old mixed conifer and pine forest habitat in the present benefits the area's many diverse forest species of concern in the future. Without protection today, the future viability of the area's listed species and species of concern is absolutely uncertain. In light of the new scientific information revealing the importance of forest connectivity and evidencing population declines of numerous old and mature forest dependent species, the Forest Service makes a very risky move to further stress these populations in the present with this project's planned logging.

Additionally, ongoing scientific research has confirmed that many old growth dependent species of concern continue to use even severely burned forest habitat, while other research concludes that many forest species of concern are deterred from utilizing forest habitat that has been degraded by commercial logging and thinning. Research concludes that logging extirpates and harms populations of goshawks, marten, lynx, eagles, osprey, wolverines, wolves, great gray and other owls, and many other species of concern, as well as populations of their prey species. The failure of the project FEIS to disclose and address this pertinent information in its analysis deprives the public and the decision-maker of essential information critical to designing a reasonable project with a likelihood of accomplishing its purpose and need goals. The project is premised in large part on the perceived need to protect area forests and wildlife habitat from the effects of severe fire(s) (as well as unspecified levels of naturally occurring insects and disease).

Given this purpose, it is extremely important that project analysis address scientific research that indicates affected species of concern are not extirpated from forest habitat from fire – and comparatively assess scientific research that indicates these species are extirpated from forest habitat from commercial logging and thinning. The failure to include this analysis within the FEIS, and the failure to include a restoration alternative based upon relevant scientific research violates the NEPA, precluding a legally acceptable decision.

Similarly, the project is premised in part on an assumption that the forests need to be protected from unspecified levels of insects and disease, and that logging is the answer to achieving such protection. However, insects, disease, fire, natural pathogens, and disturbances are integral components of natural forest ecosystems. The FEIS and ROD fail to present verifiable compelling evidence that the area's forests are outside of the range of natural variability for insect, disease, and other natural pathogens and disturbances. Forest wildlife and ecological systems are well-adapted to inherent pathogenic and disturbance events and endemic fluctuating levels. Wildlife are not generally extirpated by such natural processes. Indeed, when bark beetle insect populations rise and peak cyclically, populations of predator species from woodpeckers to small mammals to invertebrates such as arthropods and hymenoptera benefit, with an abundance of high protein forage and new habitat opportunities in the making.

The Forest Service must adequately assess and disclose these and other related issues. As such the ROD fails to meet the analysis requirements of the NEPA and must be withdrawn.

10. Plan for Reducing Fire Risk and Insect Outbreak Does Not Include Readily Available Scientific Information and is Scientifically Controversial.

There is ample scientific controversy about whether mechanical fuels treatment reduces fire risk in the mid- to higher-elevation forests targeted by the Farley Project. Mature, old-growth stands have dense, moist interiors and little wind, which inhibit the spread of wildfire. (Morrison and Smith, 2005; Rhodes, 2007) Fuels treatments that reduce stand density and open up the forest actually enhance fire spread, as fire moves more readily through an open environment. (Morrison and Smith, 2005; Rhodes, 2007) An opened forest allows fuels to dry out faster and winds to blow through the stand. (Morrison and Smith 2005; Rhodes, 2007) Thinning the understory is more effective at reducing fire risk than thinning the overstory. (Carey and Schumann, 2003) Complex and varied canopies may actually prevent the spread of wildfire better than dense, young, single-storied canopies. (Morrison and Smith, 2005)

The Forest Service's plan to disturb the canopy and interior forest conditions of mixed conifer forests is not based in the best available science. "Although the assertion is frequently made that reducing tree density can reduce wildfire hazard, the scientific literature provides tenuous support for this hypothesis." (Carey and Schumann, 2003, page 14). At the very least, the Forest Service must disclose and respond to the very lively scientific controversy about the role of mechanical fuels treatment in reducing the risk of fire in an EIS for this proposed project. See Declaration of Richard H. Waring, Declaration of Jonathan J. Rhodes.

There is no scientific support to show that commercial thinning reduces fire risk. (Carey and Schumann, 2003) Despite the stated intention to protect habitat, the project FEIS focuses more heavily on commercial logging than it does on needed restoration and protection actions. Commercial thinning is especially controversial when the permitted diameter limit allows the logging of fire resistant mature and old trees, and maturing trees

essential for forest ecological integrity, resilience, wildlife habitat, and watershed functioning.

This project allows the logging of mature trees up to 21" dbh. The science tells us that logging mature fire resistant trees does not reduce the risk of fire and actually can contribute to more intense fires. (Brown et al 2004; Carey and Schumann, 2003; Noss et al, 2006; Rhodes, 2007; Morrison and Smith, 2005; Baker et al, 2006)

The Forest Service apparently erroneously concludes that commercial logging of mature fire resistant trees is the only way to reduce the risk of fire in the planning area. The Forest Service does not need to cut trees between 12" and 21" dbh or for that matter to cut any trees in mixed-conifer mixed-fire severity mid to high elevation forests – especially trees that evidence fire resistant mature and old characteristics.

The FEIS never "disclose[s] the extent to which the impact of the proposed action is scientifically controversial," regarding the Forest Service's proposal to reduce fire risk by commercially thinning mature stands of mixed-conifer forest. 40 C.F.R. 1507.27(b)(4).

A significant portion of the commercial thinning and fuels reduction will occur in mixed-conifer forests. Scientific research has repeatedly concluded that thinning is not needed, effective, nor ecologically beneficial in mixed-conifer forest to prevent fire. Mixed-conifer forests are wetter and have a mixed-severity fire regime. (Noss et al, 2006; Rhodes, 2007) The mixed-conifer stands have developed with long-term cyclic fluctuations of low, mid, and high-severity fires; thus there is little verifiable support to show that the stands' fire regimes have been significantly altered. If the fire regime is not altered, then fuel "treatments" do not help to reduce the risk of severe fire or restore the stand to its natural fire behavior. (Rhodes, 2007) The FEIS does not present any proof that mixed-conifer forests are at "uncharacteristically severe levels" with their fuel load. The Forest Service claims are largely based upon projected assumptions that fuels are outside their "desired condition," so a large fire is expected. However, the forest is not outside of its desired condition unless the current time period without fire is longer than any time period in the areas' history. (Rhodes, 2007)

Recent research on mixed-fire severity forests shows that fire intervals and severity levels vary greatly over the course of centuries. Prolonged periods of predominantly cool-moist climate with significant vegetative growth are interspersed with periods of hot-dry weather patterns, with significant landscape scale fire severity mosaic patterns. The cool-wet era of the early to mid 1800's was followed by a gradual warming period, culminating in widespread severe fires in the late 1800's and early 1900's.

This was followed by a gradual return to more moist and cool years. The late 1900's and early 2000's were again a period of warm/hot-dry weather years, with a rise in landscape scale sever fires similar to that of the early 1900's. Factors of climate change

may be having varied and as yet uncertain influence in the region's millennial fluctuating fire severity patterns.

However, human-induced climate change remains largely unpredictable in its impacts and variations, more akin thus far to shorter-term extreme fluctuations resembling "fever-chill" patterns than a predictable gradual escalation of hot-dry periods. While insect impacts and populations are indeed documented as moving towards higher elevations, with prolonged activity, these patterns too are still likely within the range of natural variability over the long-term of time, with many other variables influencing such impacts. Ultimately, whether climate change brings greater risk of severe fires or higher levels of moisture remains a field of scientific speculation and ongoing debate. Yet, the FEIS and ROD fail to address or disclose any of these issues.

Fire suppression efforts largely were limited until the late 1940's through the 1960's. Prior to the recent era, fire fighting equipment and methods were relatively primitive and primarily limited to areas near human communities. The project area is relatively distant from residential communities, and likely did not experience effective fire suppression efforts until the mid to late 20th century. At most fire frequency patterns have been absent for 30 to 50 years, though it is likely that in much of the project area fire cycles have not been missed at all. Surveys of project units have documented evidence of relatively recent fires, contrary to the agency's claims within the FEIS. While Ponderosa pine dominated forest types are typically more frequent fire ecosystems and, as a result, they may have missed two to three fire cycles in some adjacent locations, the logging units do not focus on these areas. Instead, the project is located inappropriately in mixed-conifer mixed fire severity forests, and cool-moist forests, which are well within their historical range of variability in fire cycles, vegetative growth, and insect and pathogen levels, as verified by surveys of units throughout the project.

Based upon the recommendations of the best available science, and the site specific conditions in the project area, the mixed-conifer forests in the project timber sale area do not require logging or 'fuels' management, especially when the "treatment" will destroy important old and mature connective forest habitat for regional species of concern and ESA listed species. Fire is a natural and inevitable component in a functioning forest ecosystem, and the mixed-conifer forests in the project area are within their natural range of fire behavior. The Forest Service has not based its analysis and decision to alter the natural fire regime of the mixed-conifer forests in the best available science.

11. The FEIS Fails to Disclose Key Differences Between the Chosen Range of Alternatives, Fails to Present an Adequate Range of Alternatives and Misstates the Benefits of One While Overstating the Costs of Others in Relation to Fire, Insect Outbreaks and Climatic Change.

Analyzing alternatives is "the heart of the environmental impact statement." 40 C.F.R. 1502.14. An agency is required under NEPA to "rigorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. 1502.14(a) (emphasis added). An agency may not decline to evaluate an alternative simply on the grounds that it is not

a "complete solution" to the agency's goals. *Citizens Against Toxic Sprays, Inc. v. Bergland*, 428 F. Supp. 908, 933 (1977). Furthermore, an agency should use the NEPA process to "identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." 50 C.F.R. 1500.2(e).

The explanations of the developed alternatives considered in the Farley FEIS are inadequate. The FEIS presents a skewed assessment of the impacts of fire, insect outbreaks and climate change in its no action alternative as compared to its action alternatives. Furthermore, a restoration-only alternative is certainly a reasonable alternative to consider for this purported fuels and fire/disturbance risk reduction project, especially considering that the stated needs of the project are to improve health, vigor, and resilience to fire, insects, and disease in upland forests that are outside their historical pre-fire suppression conditions for species composition (including hardwood species), structural diversity, stocking densities, and fuel loads. This can be done while still providing a measure of sawlogs and wood fiber products for utilization by regional and local industry.

Mechanical fuels treatments alone are not enough to reduce the risk of severe fire; treatments must be accompanied by efforts to remove the underlying causes of fire risk, like logging and fire-suppression. (Rhodes, 2007). In this light, a complete disclosure of the differences among the alternative and the inclusion of a restoration alternative would focus on maintaining the "ecological integrity" of a forest ecosystem, upholding the overall goals of the NFMA, the Umatilla LRMP, the ESA, and the Eastside Screens.

Ecological integrity means ecological wholeness and would consider actual mid to high elevation mixed-conifer forest natural range of variability; forest integrity; fire patterns, cycles, and natural risks; and natural roles and fluctuating patterns of insects and disease; protecting and restoring wildlife or fish habitat; and hydrologic condition and functioning. (Brown et al, 2004) This kind of project would not remove irreplaceable mature and old trees, nor further fragment area forests with logging, roads, skid trails, landings, openings, and impacts. "The essence of maintaining ecosystem integrity is to retain the health and resilience of systems so they can accommodate short-term stresses and adapt to long-term change." *Id* at 19. None of the action alternatives focus on scientifically supported restoration of the area's mixed conifer forest ecosystem, even though restoration is the best approach for maintaining the wholeness of the forest and its habitat and reducing fire risk in the both the short and long-term.

The action alternatives focus largely on commercial logging. However, commercial logging is an ecologically damaging, ineffective, scientifically controversial way to reduce the risk of natural disturbances. Commercial logging has, in fact, not been shown in any scientific literature to reduce the incidence of large-scale fire. (Carey and Schumann, 2003) Commercial logging in important habitat does not make sense in light of the objective to protect habitat. Cutting maturing and mature and old trees not only degrades wildlife habitat, but it exacerbates wildfire severity. (Brown et al, 2004; Carey and Schumann, 2003; Noss, et al 2006; Rhodes, 2007; Morrison and Smith, 2005)

(Additional studies are included with this appeal and others provided with our comments).

Public forests have been set aside to support ecologically appropriate fire regimes and forest resiliency as well as viable populations of species. (Noss, et al 2006). The Forest Service must at least fully consider and develop a reasonable range of alternatives that are capable of truly protecting important habitat without destroying it to "save it."

Furthermore, all of the action alternatives proposed by the Forest Service would result in significant degradation to sensitive riparian areas from the introduction of sediment. The Forest Service again vastly under weighed the benefits of the no action alternative with respect to sediment deposition and the ability of streams to continue to provide habitat for ESA listed fish species and failed to consider a reasonable range of action alternatives.

Federal law requires the agency develop science based alternatives, including a restoration-only alternative, as well as a robust discussion of the costs and benefits of the selection alternatives. As the project contains logging units within contiguous viable habitat for species of concern, immediately adjacent to or within old growth, roadless, and wilderness, logging within project units would degrade potential habitat for ESA listed and other imperiled species of concern, disrupting forest connectivity and available habitat. The FEIS and ROD fail to adequately disclose and address this significant issue, and instead plan to compound existent cumulative impacts habitat degradation with even more logging harms.

Throughout the region the Forest Service has employed dubious fire models to claim that commercial logging is the only way to serve the Forest Service's needs. These models do not give, nor can they give, an adequate explanation of how mechanical fuels treatment can reduce the risk of fire. (Morrison and Smith, 2005; Veblen 2003; Carey and Schumann, 2003, and new science studies by Veblen, Rhodes, and others attached to this Appeal) The NEPA regulations allow the agency to explain why a particular option is not feasible, or otherwise not reasonable, and hence eliminate it from further consideration. 40 C.F.R. 1502.14. However, the reasons given must be adequately supported. *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 813-15 (9th Cir. 1999). An alternative which would limit actions to non-commercial thinning would sufficiently reduce the risk of fire and could meet three of the four project goals. To be considered, an alternative does not need to meet all of the project goals. Yet the agency failed to consider other reasonable alternative options, including limiting felling to trees ≤12, 14, or even 16" dbh (as called for by a range of scientific research addressing wildlife habitat needs of imperiled avian species in the region, and by other research addressing restoration, fire risk reduction, and resilience).

Without fully analyzing a restoration alternative, the Forest Service and the public will never know how the forest will be affected without commercial logging. Similarly, as the FEIS failed to assess a range of alternatives capable of achieving ecological

objectives, the public and the decision-maker have been deprived of more capable, scientifically supported, and ecologically protective alternative options.

Each developed action alternative significantly degrades viable mature and old forest habitat in mixed conifer mature and old forests, adjacent to old growth areas, roadless areas, salmonid watersystems, and wilderness. The FEIS claims that forest habitat is at risk of destruction by uncharacteristic fire, but does not disclose that old and mature forest habitat and connectivity are certain to be irreparably injured under this project. The effects to the interior mature and old forest dependent wildlife under this project are immediate and certain, while the risks the project is attempting to avoid are distant, hypothetical, and largely scientifically insupportable. Undisturbed mature forests require little or no restoration. (Baker et al) Passive restoration is the best way to return forests back to the condition first perceived by the European settlers. (McIver and Starr, 2001)

At a minimum, the Forest Service must withdraw the FEIS and ROD and analyze an alternative that would exclude the most important mixed conifer and pine mature and old forest habitat from ecologically harmful active forest management actions and protect the area's connective forest habitat, especially surrounding and linking old growth, roadless, salmonid waterways, and wilderness with adjacent mature and old forest, and high elevation forest habitat. The FEIS only analyzes "alternatives" that are virtually identical to each other. The Ninth Circuit has found that an FEIS/EIS that analyzes a no-action and other virtually identical action alternatives violates NEPA. *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 813-15 (9th Cir. 1999). The Farley FEIS and ROD take this very same approach with this project's action alternatives.

There are other reasonable alternatives to wide-scale commercial logging in mature and old pine and mixed conifer forest habitat set aside for the protection of inland native trout and salmonids. In an FEIS, the Forest Service has a duty to fully consider alternatives to the wide-sweeping logging impacts that are posed by this project. The Forest Service is required under the NEPA to conduct analysis that includes a sufficient range of scientifically credible alternatives in order to provide a basis for sound forest management decisions.

As demonstrated above, the Farley FEIS and ROD fail to provide a reasonable range of developed alternatives that include scientifically and ecologically sound management proposals. The Forest Services cites to the purpose and need as the reason for artificially constraining the alternatives and, in so doing, pre-determined the decision prior to NEPA analysis. See *EPIC v. USFS*, No. 05-17093; D.C. No. CV-04-0175-GEB (stating that similar action alternatives do not meet the requirement of a reasonable range of alternatives and a narrow purpose and need statement is impermissible).

A basic requirement of NEPA is that federal agencies must consider a reasonable range of alternative actions in an EIS. 42 U.S.C. ß 4332(2)(c)(iii); 40 C.F.R. ß 1502.14; *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223 (9th Cir. 1988), cert. denied, 489 U.S.

1066 (1988). The range of alternatives should "sharply [define] the issues and [provide] a clear basis for choice among options by the decision-maker and the public." Id. Under NEPA, alternatives analysis must:

(a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated. ...

(c) Include reasonable alternatives not within the jurisdiction of the lead agency. 40 C.F.R. § 1502.14 (a) and (c). *See California v. Block*, 690 F.2d 753, 765-69 (9th Cir. 1982) (reversing EIS for failure to address reasonable range of alternatives); *see also Muckleshoot Indian Tribe v. USFS*, 177 F.3d 800 (9th Cir. 1999) (reversing EIS for failure to address reasonable range of alternatives).

In the FEIS and ROD, the Forest Service indicates that it considered but dismissed a range of other action alternatives. The Forest Service dismisses these as if they are the only other alternatives. However, there are other scientifically sound alternatives and a significant range of credible pertinent scientific research that the FEIS failed to disclose or assess in addressing and developing reasonable ecologically capable action alternatives.

12. The Forest Service Has Illegally Vaunted Timber Targets Above The Restoration & Resource Needs That Apply to these Specific Land Allocations.

NEPA requires that federal agencies "to the fullest extent possible . . . use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." 40 C.F.R. § 1500.2(e). NEPA also requires the Forest Service to "study, develop, and describe appropriate alternatives to the recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses." 40 C.F.R. § 1501.2 (c). Environmental analysis documents must "[r]igorously explore and objectively evaluate all reasonable alternatives" to the project. 40 C.F.R. § 1502.14(a).

The Council on Environmental Quality (CEQ), which promulgated the regulations implementing NEPA, characterizes the discussion of alternatives as "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. A decisionmaker must explore alternatives in sufficient enough detail to "sharply focus the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public." Id. § 1502.14. All reasonable alternatives must receive a "rigorous exploration and objective evaluation..., particularly those that might enhance environmental quality or avoid some or all of the adverse environmental effects." Id. § 1500.8(a)(4). The analysis of the alternatives must be "sufficiently detailed to reveal the agency's comparative evaluation of the environmental benefits, costs and risks of the proposed action and each reasonable alternative." Id.

The Ninth Circuit stated in *California v. Block* that "[a]s with the standard employed to evaluate the detail that NEPA requires in discussing a decision's

environmental consequences, the touchstone for our inquiry is whether an EIS's selection and discussion of alternatives fosters informed decision-making and informed public participation." *California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982). The purpose of requiring the agency to consider a number of reasonable multiple alternatives is to insist that no major federal project be undertaken without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means. *Environmental Defense Fund v. Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974); *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810 (9th Cir. 1987), rev'd on other grounds, 490 U.S. 332 (1989).

To comply with NEPA, "the discussion of alternatives 'must go beyond mere assertions' and provide sufficient data and reasoning to enable a reader to evaluate the analysis and conclusions and to comment on the EIS." *Citizens Against Toxic Sprays v. Bergland*, 428 F. Supp. 908, 933 (D. Or. 1977). A detailed and careful analysis of the relative merits and demerits of the proposed action and possible alternatives is of such importance in the NEPA scheme that it has been described as the "linchpin" of the environmental analysis. For this reason, the discussion of alternatives must be undertaken in good faith; it is not to be employed to justify a decision already reached. Id.
The Forest Service failed to include a reasonable range of science based alternatives; and as such this legally non-compliant FEIS and ROD must be withdrawn. Among scientifically reasonable alternatives not developed, though they were noted in previous comments and summarily dismissed without addressing scientific controversy and supporting scientific research recommendations, the Forest Service must consider an alternative in its analysis which consists of treating small-diameter fuels in only ecologically appropriate forest locations (lower elevation ponderosa pine dominant – frequent low intensity fire plant association group forests) to reduce fire risk – outside of designated and uninventoried ecological roadless areas and higher elevation mixed fire severity mixed conifer forests (which should be left to nature's time proven and scientifically recommended processes). If the FEIS is accurate in its statement that there are no such forest types within the project area, then this project – lacking any credible scientific foundation - must be withdrawn in its entirety or revised as a scientifically-founded non-logging restoration project.

Additionally, when the Forest Service is faced with a choice of providing the timber industry with short term economic gain and providing for the forest's overall ecological integrity and long-term habitat viability, the Forest Service has a duty under the mandates of the NEPA and management plan direction for the lands at issue to prioritize habitat and salmonid waterway protection and recovery objectives. Umatilla LRMP designations, objectives and intent clearly uphold this priority throughout much of the Farley Project area. The presented alternatives must comply with scientific recommendations and existent LRMP-eastside screen requirements.

Functioning watersheds, diverse wildlife, and healthy soil that will sustain large-diameter tree growth in the future provides significant ecological and economic benefits to the regional and local economies, including recreation, environmental quality, water

quality, and recovering salmonid populations and watersystems over the long-term. However, the myopic focus on timber as the only viable economic reality violates NEPA's mandates to meaningfully address economics issues and impacts as they relate to the proposed action. By placing economics within the purpose and need, the agency must thoroughly disclose and address this issue. Current economic downturns and significantly reduced societal need for wood products, coupled with an over-abundance of unsold supply and consequent mill shut downs evidence that the purpose and need inclusion of wood products within its economic objectives is unfounded.

The FEIS and ROD must substantiate the claimed needs and actions. There are many other more viable economic contributions and societal needs that may better meet local needs than extracting logs from the forest. Employment could be provided by conducting the needed restoration described above, like road removal, invasive plant prevention, and watersystem restoration. And economic value is derived from natural recreation, non-timber forest products, tourism, and other natural forest uses. By failing to include developed non-commercial logging alternatives other than "no action" the FEIS and ROD violate the requirements of the NEPA, APA, and the NFMA, and must be withdrawn.

13. Influence of Timber Volume Targets.

Over the past years, conservation efforts have achieved many negotiated changes, upholding federal laws and limiting timber sales to protect old growth, forest ecosystems, wildlife, and fish. Beginning in late spring of 2007, negotiation efforts have been detrimentally affected as Forest Service staff throughout the Pacific Northwest region acknowledge they are expected to meet the elevated timber quota targets adopted by the agency in April 2007. Apparently these ecologically harmful Bush-era timber volume targets have not yet been rescinded by the new Obama administration USDA-Forest Service, despite the recent 2009 memorandum reaffirming that NEPA projects must be based in scientific integrity.

Due to the expected quota contribution to timber volumes from local national forests and ranger districts, the ability of agency planners and decision-makers to modify timber sales to lessen harms to wildlife, salmon, and other important ecological concerns has been unreasonably severely reduced. Yet agency NEPA project documents continue their failure to disclose the significant determining role timber quotas have in shaping projects, or the effect these quotas have in discouraging agency decision-makers from modifying the logging extent of projects if such modification would reduce final timber volumes.

The region's Forester at the time, Linda Goodman, wrote the following internal agency letter (included italicized in full below), confirming the existence of board foot volume targets driving the region's timber sales. This has been further confirmed and the process accurately described by the Umatilla National Forest's retiring timber planner Phil Musgrove (see below following Linda's letter).

Apparently, the agency still believes it has the discretion to impose unfounded timber volume quotas. However, continuing to issue logging project "purpose and need" statements, and analysis documents that fail to publicly disclose timber volumes are a major purpose behind the region's projects, violates environmental policy laws. NEPA requires that the public as well as the decision-maker have all pertinent information concerning proposed projects. As these quotas exist, the agency must comply with environmental policy laws and clearly disclose their existence, the specific timber target goals for the affected forest and district, and the percentage of these the particular project is expected to contribute.

The failure of the NEPA analysis to disclose the existence of Pacific Northwest Regional timber volume target quotas, and their expected local national forest and ranger district percentages, driving agency projects and influencing the development and selection of alternatives violates the clear disclosure requirements of the NEPA. The failure to disclose that decision-makers are influenced in their selection of an alternative by the expectation that their forest must meet its expected contribution to the region's timber quotas violates the requirements of the NEPA. Issuing FEIS's and ROD's such as this one, wherein undisclosed quotas set the parameters limiting the development and focus of alternatives, and the decision-maker's ability to modify a project, violates the NEPA, violates agency compliance with environmental policy laws, and violates agency accountability to the nation's public.

NEPA requires unbiased, scientifically-based, objective analysis and a full range of reasonable scientifically-sound alternatives. The existence of undisclosed quotas unduly influencing this project towards meeting predetermined agency timber volume targets violates the requirements of the NEPA. Quotas sabotage agency projects, illegally predisposing agency analysis towards developing ecologically unwarranted logging-driven alternatives, such has been done with this FEIS and ROD. This predisposes decision-makers to approve scientifically controversial or unfounded logging that is likely to result in significant harms to imperiled wildlife and biodiverse forest ecosystems. Such is the case with this project analysis and decision, which fail to disclose the existence or influence of timber volume quotas.

Written in "obfuscate-speak" style, one doesn't have to work hard to read between the lines of the former Regional Forester's April 2007 internal letter to understand timber corporation economics trump wildlife and ecological concerns in Pacific Northwest Region Forest Service projects. Yet such economics are largely no-longer even relevant, given the dramatic downward crash of the nation's and world's economies, and the lack of a current or even foreseeable projected demand for wood products.

Among the ever-growing ranks of harmful logging sales spawned by timber quotas are: Five Buttes, Snow Fuels, Lava Cast, South Bend, EXF, BLT, Black Crater, and GW in the Deschutes; Spears, East Maury, Upper Beaver, and Canyon in the Ochoco; Thorn, Knox, Black Rock, Crawford, Egley, Green Ant, and Jane (as originally proposed) in the Malheur, Wildcat, Loon, Monument, Skull, Flat, Sugarbowl, and Otter

Fire in the Umatilla. Together these and other sales total many thousands of acres and millions of board feet. The logging they plan to implement would harm wildlife and salmonid spawning habitat, destroy listed species habitat; harm pileated, black-backed, and white-headed woodpeckers; degrade habitat for marten; wolverine; lynx; wolves; goshawk; neotropical migrant and native birds; pygmy, flammulated, and great gray owls; and many other biodiverse native species of concern.

As noted in the letter from Linda Goodman (Exhibit B attached hereto), eastside forests are expected to meet westside NFP timber targets – jeopardizing eastside wildlife and forests as well. This approach is illegal, as eastside volume must be based upon LRMPs and site-specific project analysis, not westside timber volume targets which have no relevance or legal bearing on eastside national forests. The agency's blanket requirement of the region's forests to meet arbitrary timber targets violates federal environmental policy laws. Failure to disclose and analyze the impacts of this additional timber directive violates the NEPA.

Perhaps this letter from Linda Goodman is just an interesting footnote from quite a different time. However, now that President Obama has asked for a reality-based treatment of our nations' public lands and waterway, the Forest Service cannot continue to treat forests as "closets" or pursue the Bush Administration's agenda which was more on mythology (faith) than scientific reality.

Forests are an integral part of Earth's interwoven ecosystems, supporting biodiversity and the numerous species that are part of that biodiversity. The forests supply clean water and provide all the wondrous beauty of untrammeled nature. The new stimulus plan dollars could be employed for legitimate restoration, forest protection, and recovery of imperiled species – and not used to simply profit one interest and extract one value (timber) to the detriment of all others.

The agency must begin to responsibly address the failure of their Northwest Forest Plan and Eastside Screens provisions to prevent the continuing serious decline of ESA threatened-listed species, and a host of other imperiled forest species of concern. The agency must address the failure of their Eastside "Screens" provisions to adequately protect and recover the populations and habitat of numerous old growth forest dependent species of concern. A scientifically and ecologically based restoration project needs to be developed for the project analysis area, and the current legally non-compliant logging project needs to be withdrawn.

The timber quotas the agency is still yoked under must be removed. Public lands forests must be cared for responsibly, protecting and restoring the ecological integrity, biodiversity, species habitat and abundance for current and future generations. The Bush-era of egregious ecological harms must be replaced by proactive agency efforts to protect and restore the land; and for that matter, the integrity and responsibility of federal land management agencies to uphold the environmental policy laws of the nation.

The reality of the Umatilla's Pacific Northwest Region USFS allotted timber targets, and the need to achieve timber quota "accomplishments" is best described as follows (notes from a lengthy May 26, 2009 conversation with the now retiring Umatilla S.O. timber department head Phil Musgrove, augmented by additional communication with the region's forest planners and decision-makers):

A. USFS Pacific NW Region "Timber Targets"

Timber targets are issued annually for each fiscal year for each specific Forest from the Regional Office. These are found in the agency's specific Forest annual budgets. Many of the Region's individual Forests divide up the target quotas and corresponding funds evenly by District. Target volumes are given by the Regional office in Cubic Centimeter Foot (CCF) figures, which then have to be converted to Million Board Foot (MMBF) totals.

Timber target volume is comprised of a mix of: a. Small diameter and/or stewardship thinning; b. Biomass; c. Firewood; d. Post and poles; e. Hazard trees; f. Saw logs; g.Chips; h. Ad-ons from landings, skid trails, and roads. Generally 'a' through 'e' above comprise ⅓ of the target amount, with 'f' through 'h' the greater remaining ⅔ of the target volume.

B. Umatilla National Forest.

The Umatilla has an average annual 32 MMBF timber target for the last 7 or 8 years (down from 50 MMBF over a decade ago). The Umatilla's general conversion rate from CCF to MMBF equates to approximately .52 CCF per 1 MMBF. The Umatilla operates differently than other forests in Region 6 (beginning about 15 years ago). The Umatilla distributes the timber quotas and funds according to particular project volume targets likely to be completed in a given year in each District. Due to the length of time it takes the two southern Umatilla District's (the Heppner and N. Fork John Day Ranger Districts) to bring a project through analysis to Decision completion, these two Districts generally alternate annually in timber target contributions and corresponding funding levels. Average annual timber targets are:

* North Fork John Day RD 10 million board feet (mmbf);
* Pomeroy RD 8 to 9 mmbf;
* 5 to 6 mmbf each for both the Heppner and North Fork John Day Districts (tending to average 6 to 8 mmbf on a given year for one of these, while the other contributes additional target volume largely from firewood, small diameter thinning and biomass, and post and poles).

The Umatilla's annual timber targets generally include an average of 10± MMBF from a mix of non-timber sale, non-saw log, and 'ad on' timber sale sources:

- 4 MMBF from firewood;
- 2 to 4 MMBF from stewardship fuels;
- 2 to 4 MMBF from biomass;
- 2 MMBF from 'ad on' skid trail and landings volume;

Generally 21± MMBF is needed annually from Umatilla NF timber sales to complete the timber target volume (the average timber sale is comprised of 25% non-saw timber). District timber target quotas are determined yearly at the beginning of each fiscal year based upon potential projects completion dates and final budget advice to the Districts, as 'timber shop agreements' in the budget information. The Forest operates on these interim projected budgets for a period of months, until Congress assess annual operating budgets for the USFS anywhere from December to as late as March in some years; and until the USFS designates the final budget amounts (to which the targets correspond), often as late as June.

All of the above is recorded in USFS record keeping systems ("PITSAR"). Total annual accomplishment reported in this system for saw timber volumes are reportedly clear, while other volume sources are difficult to ascertain. The timber target specifics and 'rules' are reportedly "not written in one spot."

The Umatilla NF timber shop notes "6 Gates" for any project: 1) project initiation; 2) signed record of decision, close of appeal period, and no litigation filed; 3) sale marked and cruised; 4) contract drawn up and sale appraised; 5) sale advertised and auctioned; 6) contract awarded. This "6 gate" process involves time expectations. Additional "gates" needed that Agency time and resource limitations largely do not permit reportedly include: 7. implementation; 8 sale closure; and 9 post project monitoring.

The Umatilla's 'timber shop' prefers not to auction and award timber sale contracts until appeals have been resolved and there remains no threat of litigation. They "do not put under contract" unresolved sales as if these are halted by judicial review they could cost the Umatilla's operating budget 15% of the log value paid to the sale's purchaser as damages.

If timber targets are not met in a given year the unmet quota is carried over into the subsequent year, added to the total timber target, but without additional funds to accomplish this, as the Agency considers the project already funded the previous year. In situations where additional analysis is required, such as an EIS in the case of a prior legally deficient FEIS or a Supplemental EIS, carry over can stress an affected Forests budget and resources.

The above details are from a May 26, 2009 conversation with Phil Musgrove, Umatilla National Forest timber planner & "timber shop head."

C. PNW Region Forests: Ochoco and Deschutes National Forests – Timber Targets.

Additional USFS communication notes that the Lookout Mountain Ranger District Ochoco NF has a 12 MMBF annual timber target (from Rob Rawlings, District silviculturalist); appeal resolutions on the Deschutes and Ochoco have met quota

limitations noted informally by District Rangers and/or Forest Supervisors (Bill Queen, and Art Currier before him, Lookout Mountain RD, Ochoco NF; Mike Lawrence, Paulina RD, Ochoco NF; Christine Frisbee, Crescent RD, Deschutes NF; and referred to by various agency personnel in the Umatilla, Malheur, Ochoco, and Deschutes National Forests).

From communication with USFS decision-makers and staff throughout Oregon's eastside forest region (who have requested anonymity for career continuity reasons), it is plain that funding for individual National Forests is dependent upon meeting timber target "accomplishment" goals. Failure to meet these goals results in reduced available funding and a carry over of timber quota NEPA work into subsequent years. Various USFS regional decision-makers and staff have stated "off the record" that career advancement and continuity are in-part dependent upon being a "team player" in meeting agency timber goals. The failure to publicly disclose this foundational driving force behind timber sale projects disguised as "forest health" violates the disclosure requirements of the NEPA. The FEIS and ROD must be withdrawn, and either the USFS must withdraw its timber target quota and timber accomplishment based funding of the region's forests, or it must openly disclose this as a driving factor behind its management projects.

14. The FEIS and ROD Violate the NFMA Planning Regulations.

The Forest Service needs to withdraw the FEIS and ROD and conduct a new EIS analysis that complies with the 1982 rules. On the same day that the Forest Service issued the final EIS and ROD for Farley, the 2008 NFMA planning regulations were vacated by a federal court as legally noncompliant with the requirements of NFMA. *Citizens for Better Forestry v. USDA*, 2009 U.S. Dist. LEXIS 55510 (N.D. Cal. June 30, 2009).[1] The Forest Service, however, has failed to re-evaluate its NFMA conclusions for the Farley project using its 1982 planning rules. The agency needs to withdraw the EIS and ROD and conduct a new EIS analysis that complies with the 1982 rules and it needs to do so while providing for full public review and meaningful public involvement.

Appellants request that the Forest Service utilize the 1982 NFMA regulations because while the *Citizens for Better Forestry* decision does not clearly direct the Forest Service to implement either the 1982 rule or the 2000 rule in replacement of the 2008 rule, it is clear that the substance of this judicial decision emphasizes legal analysis requirements that are more clearly met by the 1982 rule requirements regarding MIS species surveys, and population and habitat viability. Additionally, appellants strongly caution against the utilization of the ecologically negligent 2000 rule as a replacement for the legally invalid 2008 rule, as the 2000 rule was a step backwards in terms of resource protection and managing effectively for biological diversity from the more credible requirements of the 1982 rule. Continued reliance on faulty analysis procedures and ineffective scientifically flawed rules would be likely to invalidate agency projects through additional judicial action yet again.

[1] This decision is posted on the Umatilla website therefore, the Forest Service was clearly aware of it, *see* http://www.fs.fed.us/r6/uma/blue_mtn_planrevision/documents/6-30-09%20SJ%20Order.pdf

15. Impacts to Terrestrial Wildlife Species Must be Fully Disclosed.

Wolves - The FEIS and ROD fail to adequately address the projects detrimental impacts on wolves that may utilize the project area, as wolf populations are known to be returning to Oregon and have been reported within the Umatilla National Forest's northeastern Oregon Ranger Districts. The project area may play a critically important key role as contiguous connective habitat between the wilderness and the roadless area for wolves. Wolves prefer large roadless undeveloped forest areas and natural ecosystems such as found in the greater project area. Wolf presence in Eastern Oregon and the Umatilla NF has been recognizably increasing over the past few years, with reports of wolf sightings growing exponentially. It is well known that management actions that remove forest cover, degrade natural ecosystems, and allow for more human visibility and movement, significantly decrease returning wolves chances for survival. Logging the Farley Project would subject any current or future wolves in the area to increased risk of death from illegal human shootings. Ongoing logging and management action disturbance throughout the lengthy duration of project implementation will disrupt wolf pack and prey species movement patterns, and fragment now connected territory. Project actions are likely to drive wolves from the area, and scatter prey species and pack members, potentially exposing ESA protected wolves to harms and area ranch livestock to depredation as displaced wolves attempt to locate sustenance and safe territory free of logging and management disruption, noise, and impacts.

Lynx - Among our many concerns is that of this project's effect on lynx. Based on data from the U.S. Fish and Wildlife Service's (USFWS) Portland office, there have been past sightings of lynx in the Oregon Cascades region, including the Umatilla NF. Historic evidence of lynx in these areas includes positive occurrence records, lynx bounty claims, and Forest Service Wildlife Statistical Reports. Positive reports of lynx occur as far south as Modoc County, California. As this is the case, the project area may be important to lynx recovery. It is plausible that lynx are rare in the project area (and in Oregon on the whole) due to bounties, aerial poisonings, and other efforts to eliminate them (and other predators) that were performed systematically for decades, and not due to a lack of habitat, as is the current situation with wolves as well. However, surveys of the area by Appellants discovered suitable lynx habitat and abundant prey species throughout significant portions of the project and surrounding area.

The USFS should have adequately addressed how further fragmentation of the planning area will affect lynx. It is clear that lynx habitat is very fragmented, and that large blocks of intact forest are required to maintain viable populations of the species. Without these large blocks, lynx may need larger ranges to survive. The project is located in the North Fork John Day District's mountain forests, in and within range of mixed conifer forest habitat known to be preferred by lynx, including mixed conifer forests, and connective forest habitat with roadless and wilderness areas. The proposed logging in the planning area may adversely affect whatever lynx recovery is occurring, as lynx may use portions of this area for both nocturnal foraging as well as migratory and dispersal routes and refuge. Continuing to squeeze lynx out of their habitat range by intensively managing

the land runs afoul of NFMA's requirement that the agency maintain viable populations of wildlife that are well distributed across the landscape. 36 C.F.R. § 219.19. The USFS has an obligation to accurately assess the impacts of its project on lynx.

Next, it is clear that data is lacking on the food habits of lynx in Oregon's forests, which represents a critical research need. Ruggiero, 1999b; Aubry, 1999. It is well accepted that lynx are dependant on snowshoe hares as a prey base, but in the southern portions of lynx range squirrels, other rabbits, small rodents, birds and other wildlife may always be an important part of lynx diet. Some of these same prey species may also be important to raptors and other wildlife species of concern. It is critical to understanding how this project may impact lynx to examine how it will impact lynx prey.

Snowshoe hares, squirrels, and other mammals have different habitat needs, but many of these species could be negatively impacted by the fragmentation, logging, road building, and other actions associated with this project. Most of these prey species require adequate cover (USFWS, 1999), especially conifer cover in winter (GTR-RM-254), and foliage that is accessible during winter snowpack conditions. Hares, squirrels, and forest-dependent species are typically associated with dense forest cover, including shrubs and "dog hair" thickets of small trees. McKelevey, 1999a. Many of these prey species also perform important roles in the recovery of fragmented forest habitat, helping to spread seeds of forest plants and trees, distributing nutrients throughout area soils, and loosening compacted soil areas—none of which was sufficiently disclosed or addressed in the FEIS.

Edge areas within and adjacent to dense mixed conifer forests provide viable habitat for many species, including potential prey species for lynx. The adjacent wilderness and roadless areas also provide potential habitat, and the project area likely serves as dispersal and migration corridors, as well as supplemental habitat for lynx that may occur within, or traverse through, the project area. The selected action alternative, and the FEIS's two developed action alternatives, would log connective mature and old forest habitat, resulting in significantly further reducing needed cover for wildlife, jeopardizing both lynx and their prey species viability across the area—in violation of the NEPA, NFMA, and the ESA.

Different timber harvest methods can have detrimental impacts on many of these species, including squirrels, rabbits, rodents, and birds, as well as snowshoe hares. Koehler and Brittell (1988) predict that it may take up to seven years after logging an area for hares to recolonize the site and up to 25 years before they reach their highest densities. Bull (1999) examined the results of a variety of harvest prescriptions on hares and found that in lodgepole stands, the number of snowshoe hares decreased in all types of harvest. She reports that mixed conifer stands appear to be "no longer suitable for hares after harvesting." This same is also true for many of the other forest-dependent species which comprise the lynx's diet.

Squirrels have different habitat needs than snowshoe hares and are associated with mature, cone-producing forests. Ruggiero, 1999a; Buskirk, 1999b; McKelvey,

1999a. They tend to reach their highest densities in late-successional, closed-canopy forests with substantial quantities of course woody debris. The FEIS fails to adequately address potential impacts this project may have on squirrels, and ignores an important component of lynx diet. The discrepancies and deficiencies of FEIS assertions further underscores the failure of the agency to adequately disclose and analyze this important issue.

The FEIS failed to provide a thorough examination of how the project will impact both hares and squirrels, as well as other wildlife species which are potential lynx prey. Without complete analysis of how these prey species will be impacted, it is impossible to quantify and qualify the impacts to lynx. The FEIS failed to adequately analyze the cumulative impacts of this project on lynx prey in association with other projects on the District, Forest, and surrounding lands.

In sum, The Lynx Conservation Assessment and Strategy (LCAS) clearly asks that the Forest Service perform project specific analysis for each project. The lack of project specific analysis has been a long-standing problem with the Forest Service. The USDA Office of the Inspector General in its January 1999 report (No. 088001-10-At.) tries to correct this problem but the Forest Service has ignored the recommendations of this report. The LCAS executive summary states:

Plans that incorporate the conservation measures, and projects that implement them, are not generally expected to have adverse effects on lynx…. However, because it is impossible to provide standards and guidelines that will address all possible actions, in all locations across the broad range of the lynx, project specific analysis must be completed.

It is clear that the Forest Service has not completed NEPA required accurate analysis and therefore is in violation of the LCAS, as well as the ESA and NFMA. The FEIS and ROD make little mention as to any site-specific to protocol recent surveys supporting the agency's determinations, fail to adequately disclose surveys or survey protocol, methodology, areas or frequency. In this regard, the FEIS and ROD planned logging actions, and inference of non-significance is arbitrary and capricious and therefore illegal. The FEIS and ROD must be withdrawn and a new EIS conducted which addresses and corrects these analysis deficiencies and illegalities.

Wolverine – Appellants submit that wolverine may use the planning area as part of their seasonal and nocturnal foraging and territorial wandering patterns. Winter season surveys by our organization over the past decade have found likely wolverine snow tracks within the region's forests. Wolverine are known to have a 150 square mile or more winter range, and are also known to utilize roadless and wilderness areas—including the areas surrounding and linking these preferred places. It is also well known that human disturbance related to the project activities is likely to alter the movement patterns of wolverine and other wildlife species. Failing to adequately and accurately address the likely impacts to wolverine by the Farley project actions, given the large

home ranges of these animals, and the likelihood of wolverines in the project area, violates both NEPA and NFMA.

The FEIS fails to adequately analyze how wolverine will be affected by the planned project. Because it is probable that the species utilizes the project area for some life cycle needs, the USFS is required to accurately address how the commercial logging and road building projects will affect those needs and the species itself. The FEIS's failure to do so, and its irresponsible dismissal of the project's likely adverse impacts to wolverine, including the project's likely incremental role in ongoing trends pushing this species towards uplisting under the ESA, violates NEPA and NFMA. 40 C.F.R. § 1502.16 (environmental consequences); 36 C.F.R. § 219.19 (fish and wildlife resources).

Given the sensitive nature of this species, it is likely that the project will decrease Wolverine viability through the actual loss of connective travel, nocturnal, and seasonal foraging habitat, and possible loss of individuals. This is inconsistent with the Forest Plan as amended and NFMA because the project would contribute incrementally to Wolverine populations trend towards listing, 36 C.F.R. § 219.19.

Wolverine are already listed as "Sensitive" in Oregon by the Oregon Department of Fish and Wildlife, however the Forest Service fails to adequately address this within the FEIS, or disclose any consultation with ODF&W regarding recovering and protecting wolverine and their habitat. These failures are in violation of the requirements of the NEPA, and in contravention to the necessary cooperative interagency efforts needed to begin the recovery of this species and its required habitat.

Recently, researchers in eastern Washington near Mount Adams and the Yakima Nation wildlands photographed wolverines. Documented wolverine presence exists in the Umatilla's North Fork John Day Ranger District, and near Fossil, Oregon as well. It is highly probable that wolverine use and depend upon the Farley Project area as connective refuge and habitat.

American (Pine) Marten. – The FEIS does not adequately consider the effects of the proposed project on American marten in the planning area. The forests of the Umatilla including the Farley Project area have historically provided marten habitat. It is likely that at least some of the greater project areas still provide marten habitat—both for denning and foraging, as well as dispersal and travel corridors, as recent scientific research confirms that old forest dependent wildlife species are well adapted to the cyclic natural disturbance changes in the region's fire ecology forests ever changing mosaic patterns. Research has also documented that martens and other forest-dependent species are not adapted to logging and road disturbance however, and that these management actions can extirpate and harm marten populations and habitat. The FEIS fails to adequately and responsibly address this issue.

The agency has an obligation under NEPA to assess the direct, indirect, and cumulative impacts to all species that will be affected by the project actions. 40 C.F.R. §§ 1502.16. The Forest Service also has an obligation to obtain missing information or

state why it could not be obtained if that information is necessary to make an informed decision. Id. § 1502.22. Finally, the agency has a duty to prepare a new EIS when there are unknown risks to the environment—and its current FEIS is deficient in addressing these issues. Id. § 1508.27.

In this case, the Forest Service failed to accurately and adequately assess how the proposed timber sale(s) and road construction into mature and old forests, into connective habitat between roadless and wilderness, and in previously unroaded areas, will impact marten. The Umatilla NF clearly is not meeting the requirements of NEPA and NFMA as they apply to pine marten, and is precluded from any further action on the proposed project as a result. The FEIS and ROD as such must be withdrawn and a new legally responsible EIS must be prepared.

16. Impacts to Avian Species Must be Fully Disclosed.

Eagles – Eagles utilize the greater area and may at times be found within the project's units and adjacent areas. As these and other raptors rotate their nest locations over time, it is possible that project units and adjacent areas could be used by eagles for roosting, nesting, and hunting territory. Surveys throughout the region's forests over the past 16 plus years by our organizations have frequently found eagle nests within interior forest areas, often several miles from their salmonid hunting and roosting sites. The FEIS and ROD violate the NEPA by their lack of meaningful and accurate analysis, and requisite meaningful scientific disclosures and conclusions regarding eagles.

Northern Goshawk and Other Forest Raptors - Appellants have several concerns regarding Northern Goshawk, and related concerns to other forest raptors in the area, including osprey, eagles, sharp-shinned and Cooper's hawks, and others. Goshawks currently are utilizing the forests of the project and surrounding areas for nesting, fledgling, and foraging. Goshawks, similar to many predatory species, rotate their nesting and foraging territories over time, so as to not deplete their prey species populations and thus maintain their viability over the long-term. Given this, to ascertain potential Goshawk use, agency surveys must be conducted seasonally each year to determine the rotational patterns of Goshawks for the project and adjacent area forests. Goshawks also have an extensive foraging territory. It is likely that nesting pairs may utilize significant portions of the project area's mature and old forest areas, as well as adjacent wilderness, old growth and mature areas, and roadless forests. It is also known that forest edge areas may be utilized as foraging territory by this species. It is also been demonstrated in scientific research that logging within goshawk territory, including anywhere near PFA's and nest buffers – even though outside of these areas - generally results in adverse impacts to goshawk viability, including the abandonment of nests, and the mortality of fledgling young and/or parents. The FEIS fails to adequately address impacts to this species such as how logging removal of forest canopy cover, and further fragmentation of the area's forests, will affect adult and juvenile goshawks and other raptors, or other direct, indirect, or cumulative effects to goshawks and other raptor species. The FEIS fails to adequately address impacts to Goshawk nesting areas, including sufficiently assessing historic nesting areas, within or adjacent to the proposed

logging project. Similarly, the FEIS fails to adequately address potential direct and cumulative impacts harms to existing raptor nests of other species in the area.

Several scientific studies exist regarding significantly detrimental logging impacts to Goshawks due to logging within or near Goshawk PFA's, as well as from fragmentation of natural forest habitat. (Reynolds et al, 1982, 1989, 1991; Moore and Henry, 1983; Fleming, 1987; Hall, 1984; Saunders, 1982; Crocker Bedford et al, 1988, 1990, 1991; Patla, 1991; Hayward and Escano, 1989; Kennedy, 1988; Shuster, 1980; Speiser and Bosakoski, 1987; Woodbridge et al, 1988; Bendire, 1892, Bull, 1988; Hargis et al, 1991; Bryan and Forsman, 1987; Andeson and Shommer; among others). Some of these studies were conducted for the agency. However the FEIS violates the NEPA by failing to adequately and accurately disclose or assess this pertinent information. As such and the agency fails to uphold its responsibility to address these issues thoroughly as required by both the NEPA and the NFMA. The FEIS fails to address the cumulative impacts of the project along with past, present, and reasonably foreseeable future actions, in violation of NEPA, 40 C.F.R. § 1508.7.

Appellants are concerned about the affect of the planned transformation of the commercial logging units from mature and old mixed-conifer multi-storied forests, to more open forest areas preferred by other raptors such as red-tailed hawks, which could extirpate goshawks from logged unit areas. It is known that suitable goshawk habitat contains a mix of dense multi-storied stands for nesting – such as currently exists in the project area. The project will remove necessary foraging, fledgling, and nesting habitat, which may result in the loss of potential Goshawk nesting habitat, as these features are inextricably linked within the greater Goshawk territory, thus resulting in fewer pairs of nesting birds within the area, or a loss of either or both fledgling juveniles and/or adults to predation or other mortality associated with logging impacts. The failure of the project's action alternatives, including the selected action, to protect goshawk habitat would further reduce potential nesting and foraging habitat and thus violate NFMA's requirement to maintain viable populations of these and many other forest canopy-dependent species, 36 C.F.R. § 219.19. It is clear that the agency must prepare an EIS to deal with this issue legally and adequately.

Neotropical Migrant and Native Birds - Neo-tropical migrant and native forest-dependent birds (as well as numerous other forest species) are in serious decades-long population declines due to the adverse cumulative impacts from over a century of commercial logging in Oregon (see "Avian Population Trends" by Brian Sharp). The FEIS for this planned project fails to fully and adequately disclose the current population status and trends of native forest dependent Neotropical migrant and native avian species within the analysis area and adjacent forest. Compliance with both the NFMA and the MBTA requires that all alternatives presented within the FEIS, including the selected alternative, must be capable of protecting forest habitat for these many native forest species, and of reversing any current downward population trends. Such a course of proactive protective action is also required by the ESA and the NEPA, Presidential and USFS directives, and the Migratory Bird treaty Act, as well as credible conservation science and ethical integrity. However, in violation of these legal and ethical

requirements, the FEIS presents action alternatives which would degrade habitat and further imperil neotropical and native avian species populations, resulting in both individual mortality to these species as well as irreparable habitat and population level harms.

The Farley timber sale(s) would significantly impact migratory birds in violation of the Migratory Bird Treaty Act, 16 U.S.C. §§ 703—712 (1994). It is well known amongst the conservation-science community that many migratory birds which are currently experiencing severe population decline trends are "strongly associated" with old and mature interior forest and related habitat. The project's commercial "thinning" logging would likely directly kill nesting and fledgling migratory birds. The project logging would significantly reduce existing mature and old forest-dependent migratory bird habitat, which has already been significantly diminished due to the cumulative impacts of past management throughout much of the Umatilla National Forest, including the project area.

The project logging units would irreparably fragment migratory bird habitat. Areas that were not logged would also be negatively impacted by generalist bird species favored by the environmental conditions created in highly fragmented logged forests. Other avian and predator species more adapted to open logging thinned forests would move into the project area, further adversely impacting interior mature and old forest dependent neotropical and migrant avian species. The impact these abundant and highly competitive bird species would have on sensitive bird species dependent on less fragmented forests should have been adequately disclosed and evaluated in the FEIS. The adverse impacts that the project logging would have on migratory birds are supported by multiple scientific studies.

Forest fragmentation, including loss of viable nesting habitat within central and eastern Oregon's national forests, is considered to be a primary cause behind declines observed in many forest songbird species. Further loss or fragmentation of habitat could lead to a collapse of regional populations of some forest birds (Robinson et al. 1995). As landscapes become increasingly fragmented, regional declines of migrant populations may result (Id). In the Pacific Northwest, researchers have found that old growth forests and natural forest processes (including natural fire-recovery) are integral to the survival of migratory birds. The past and continuing logging-oriented management of the forests of Oregon and Washington, which provide nesting and fledgling habitat for numerous migratory birds, has resulted in severe ongoing population declines in forest canopy-dependent migratory and native birds. (reference: "Avian Population Trends in the Pacific Northwest" by Brian Sharp). Among the many avian species experiencing population declines due to Forest Service logging projects are: band-tailed pigeon, rufous hummingbird, olive-sided flycatcher, winter wren, song sparrow, golden-crowned kinglet, pine siskin, solitary vireo, willow flycatcher, tree swallow, red-eyed vireo, yellow warbler, yellow-breasted chat, and others as well. This information was not adequately addressed in the FEIS despite the obvious direct adverse impacts to many migratory and native bird species from the removal of forest canopy cover and forest structural continuity which would occur with the implementation of this project. Failure

to sufficiently disclose and comprehensively analyze this pertinent, essential, scientific information violates provisions of the NEPA. Implementation of this project would violate both NFMA and the Migratory Bird Treaty Act. As such the FEIS and ROD must be must be withdrawn, and an EIS must be prepared which addresses these issues.
In August 1999, the FWS outlined what it perceived to be the agency's legal obligation in terms of migratory birds and timber harvest. FWS stated that agencies should take "an extremely cautious position with respect to the intentional take of migratory birds by federal agencies." Letter from Acting Director, United States Fish and Wildlife Service, to Regional Directors, Regions 1–7 and Assistant Director, Refuges and Wildlife (August 17, 1999), 3. FWS also cautioned that "the Service should not assert in any communication or correspondence that federal agencies are not covered by the prohibitions of the MBTA [Migratory Bird Treaty Act]." Id.

In July 2000, the Eighth Circuit Court of Appeals held that federal agencies are required to obtain a take permit from FWS prior to implementing any project that will result in take of migratory birds. *Humane Soc'y of the United States v. Glickman*, 217 F.3d 882 (8th Cir. 2000). Due to this litigation, the FWS is operating under the assumption that the Migratory Bird Treaty Act applies to the Forest Service and its activities. 16 U.S.C. § 703 et seq. The Act states that "it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill . . . any migratory bird." 16 U.S.C. § 703.

In January 2001, President Clinton signed Executive Order 13,186 that outlined the federal government's responsibility to comply with the Migratory Bird Treaty Act. Exec. Order No. 13,186, 66 Fed. Reg. 3,853 (2001). President Bush did not rescinded this Order, and it is likely President Obama will continue to honor, and may even strengthen it. Recent legal analysis confirms that the Forest Service must actively prevent the take of migratory birds, or obtain a permit for incidental take of individual species. Helen M. Kim, Chopping Down the Birds: Logging and the Migratory Bird Treaty Act, 31 Envtl. L. 125 (2001).

The Forest Service has failed to comply with these legal and scientific obligations. Until the agency can demonstrate that it has complied with the requirements of the Migratory Bird Treaty Act, the current deficient FEIS and ROD for this project must be withdrawn and an EIS must be prepared.

Further, the FEIS did not accurately address the direct, indirect and cumulative impacts that the project would have on migratory birds. The USFS has on record a study by Brian Sharp ("Avian Population Trends in the Pacific Northwest" as cited above), which concludes that commercial logging in public forest lands in Oregon plays a significant role in the continuing population declines of several neotropical migrant bird species. The failure to disclose the full conclusions and implications of this study in the FEIS is particularly egregious in that the study was done for Region 6 of the Forest Service specifically on Central/Eastern Oregon forests. The lack of adequate scientific assessment of this study in the FEIS fails to meet NEPA's requirement for high quality scientific analysis that would satisfy the "hard look" standard. *Robertson v. Methow*

Valley Citizens Council, 490 U.S. 332, 353 (1989); *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208 (9th Cir. 1998) cert. denied, *Ochoco Lumber Co. v. Blue Mountains Biodiversity Project*, 119 S.Ct. 2337 (1999).

17. Impacts to Salmonid Waterways, Habitat, & Aquatic Resources.

The project area includes headwaters and tributaries to the area's salmonid waterways. The rivers and streams in the area are listed as water quality impaired on Oregon State's 303(d) list, for water temperature, sedimentation, and dissolved oxygen.

Listed, proposed, and sensitive aquatic species have been confirmed in affected rivers and creeks in the area. The FEIS does not contain sufficient information on site-specific stream surveys within the project area, failing again to note why or when these may become available. Despite the lack of this necessary information, the agency has issued a ROD with plans to move forward with the Farley project based on deficient information and analysis in the FEIS rather than responsibly conduct an EIS for this project, and obtain and assess the requisite missing information.

Listed imperiled aquatic species include: Snake River steelhead (ESA Threatened), Snake River spring/summer Chinook salmon (Threatened), Snake River fall Chinook salmon (Threatened), Columbia River bull trout (Threatened), Snake River Sockeye salmon (Endangered & Extirpated), Coho Salmon (Threatened & Extirpated), Redband trout (Region 6 Sensitive), Pacific lamprey (Region 6 Sensitive & maybe extirpated), Margined Sculpin (Region 6 Sensitive).

Given the number of listed and regionally sensitive aquatic species in and downstream of the project area; the number of species that have already been extirpated due to cumulative degradation of natural habitat and watersystems; the extensive management actions proposed in stream reaches and upper tributary headwaters to the greater watersheds 303(d) listed waterways; and the apparent complete lack of surveys assessing the water quality status and habitat conditions within project area creeks and streams; it is clear that an EIS, not an FEIS, is required for a project of such scope and impacts.

The FEIS fails to adequately address or disclose issues of soil stability, displaced soil movement patterns, erosion channels and cumulative impacts issues, sedimentation, airborne sediments from logging activities, stream headwaters and reaches, peak flows, water quality recovery concerns and objectives, salmonid populations and spawning areas, and other concerns. Beyond a mere list of listed-species and species of concern, and unsubstantiated findings (that the project is not likely to contribute sediment or degrade water quality or adversely affect species, etc.), the project NEPA documents fail to disclose sufficient information and analysis to substantiate project action impact determinations, mitigation provisions, and claims. The FEIS fails to disclose adequate substantive information regarding riparian associated wildlife and plants, and recent surveys for aquatic habitat conditions and/or species of concern that may be in, near, or downstream of the project areas.

It is clear from surveys of similar logging and fuels projects in salmonid watersheds, and from pertinent scientific research, that the project as proposed will likely result in significant measurable irreparable harms to the area's salmonid waterways, habitat, and populations. The FEIS fails to adequately and accurately analyze whether the Farley project is consistent with the standards and guidelines of INFISH and PACFISH. The agency has failed to conduct, assess, and disclose the necessary to protocol aquatic system surveys within the affected project area watersystems to reach any conclusions on the actual and/or potential impacts of this project. Because the FS has failed to reasonably demonstrate that the Farley sale is not inconsistent with either INFISH or PACFISH, its selected actions are arbitrary and capricious, and likely to result in irreparable harms, and as such the ROD and FEIS must be withdrawn.

Aquatic Species and Watershed Habitat/Water Quality Issues:

Chinook Salmon, Steelhead, Redband Trout, Bull Trout, Lamprey, Sculpin
The FEIS fails to accurately disclose to protocol ongoing and/or recent surveys for these and/or other aquatic species in the affected watersheds, or to explain why this has not occurred and when these surveys may be done. The FEIS fails to present convincing evidence that it may arrive at its conclusions of minimal to no impact to these species and their habitat from such a widespread logging, roading, and burning project, given the lack of area waterway surveys and any verifiable project location information pertaining to waterway status, habitat, and localized aquatic species presence and population trends. Absent this pertinent site-specific survey information, and in contravention to a wealth scientific research addressing the many known adverse impacts of logging and road building on salmonid species populations, habitat, and water system quality, the FEIS and ROD authorize extensive harmful logging and road construction, with the Forest Supervisor selecting the most extensive logging alternative of the Farley Project's similar logging action "alternatives." Despite significant scientific documentation that steelhead and bull trout are among the most critically sensitive imperiled fish species, the FEIS concludes the project is not likely to result in significant or apparently even cumulative harms. The FEIS fails to accurately disclose and address how the project will affect both short and long term bull trout, chinook salmon, steelhead, and redband trout recovery objectives in and downstream of the project area.

The analysis presented, and lack of verifiable information, fails to support the FEIS's impacts conclusions, and fails to address pertinent scientific research and recommendations for salmonid habitat and population recovery. The FEIS and ROD fail to disclose the range of scientific controversy concerning logging and road building actions in salmonid waterway forests in violation of the NEPA. The project if implemented would likely violate the NEPA, NFMA, CWA, and ESA with respect to salmonid species and their habitat, and likely result in further significant incremental harm to these species. The action as proposed fails to comply with the Forest Plan standards. In particular, the project threatens violations of the Clean Water Act by increasing the temperature of streams that are already water quality limited for temperature; by failing to maintain habitat for steelhead; and by not contributing to the goal of increasing anadromous fish runs in the Columbia River basin.

Steelhead are an MIS and the Forest Service has failed to ensure their viability. NMFS even acknowledges that the Middle Columbia River distinct population segment ("DPS") is not viable. The Forest Service must at least "cite[] published scientific studies conducted by qualified scientists" and rely "on its own wildlife biologist's evaluation" and then "explain[] how it reached each of the viability conclusions, and discuss[] the associated issues." *Native Ecosystem Council v. Kimbell*, No. 07-35360, 2008 U.S. App. Lexis 27199, *5 (9th Cir. Dec. 19, 2008).

The FEIS and ROD as such must be withdrawn and an EIS conducted that responsibly addresses these issues, with a range of restoration alternatives capable of protecting and restoring these imperiled species and their habitat.

18. Endangered Species Act & Magnuson Stevens

The section 7 consultations regarding the effects of the Farley project on ESA listed fish species are inadequate. With respect to the bull trout and Mid-Columbia River ("MCR") steelhead consultations are faulty because (1) the agencies did not take into considered the effects of the temperature increases that will be caused by the project; and (2) the agencies failed to adequately analyze the impacts of the sediment that will be deposited in bull trout habitat from the Farley project on the fish including on their ability to use the habitat for spawning.[2] The project effects are not temporary but will occur over the course of three to five years if not longer.

The Forest Service's failure to disclose and analyze the impacts from the project as discussed in this appeal and the attachments means that the agencies' jeopardy, adverse modification, and incidental take conclusions are unlawful. Without analysis of the actual impacts from the project, the FWS and NMFS's no jeopardy determinations, incidental take decisions, and NMFS's no adverse modification conclusions are not defensible. Nor have FWS or NMFS adequately accounted for the overall impacts of the project to fish when determining the level of take that will occur. Between the degradation of spawning areas, decreased water quality in fish habitat that supports other life functions, as well as moving fish and otherwise disturbing them, the Farley project will result in a high level of take of listed species.

The scope of the action area and the baselines used to determine the effects of the project on listed fish species and their habitat are also faulty because the FWS and NMFS used parameters that were too narrow. The Appellants question how NMFS can on the one hand acknowledge that the Middle Columbia River DPS of steelhead is not viable but then allow a project to go forward that will further deteriorate the utility of the watershed for ESA listed fish. Both agencies' deferral to RHCAs to remove sediment from runoff is not sufficient mitigation, because scientific study has shown that RHCAs are not as effective at removing sediment as the agencies believe.

[2] In light of these impacts, the Forest Service and the FWS should have engaged in formal consultations.

Appellants remind the Forest Service of its independent obligation to insure that the activities it is authorizing are not likely to jeopardize the continued existence of listed species or result in adverse modification of designated critical habitat. Additionally, the Forest Plan mandates that the Forest Service meets "l[l]egal and biological requirements for the conservation" of ESA listed species and the Forest Service is not complying with that requirement with the Farley Project.

With respect to the mitigation measures imposed by NMFS due to its conclusion that the project "may adversely affect" designated essential fish habitat ("EFH") for Chinook salmon, these measures are inadequate because they fail to address all the impacts to Chinook salmon from the project. The impacts result from sediment delivery due to ground disturbing activities in RHCAs, from road construction and re-construction, landing construction, and other sources were not mitigated nor were the impacts to water temperature addressed. In the end, the NMFS has failed to require sufficient mitigation measures to address the project's adverse effects on EFH.

19. Project logging and associated activities will cause cumulative impacts that violate PACFISH and INFISH.

The Farley project threatens violations of PACFISH and INFISH. The project will likely have impacts on riparian habitat that have not been adequately disclosed by the Forest Service or analyzed by the agency thus hampering the ability of RMOs to serve their purpose.

Large logs are an essential feature of healthy complex aquatic habitat, because they armor stream banks, provide pool habitat, help store sediment, help dissipate energy during high flows, and physically partition habitat. Large wood is contributed from both inside and outside the riparian habitat conservation area. Large wood in upstream, upland forests plays critical roles in the long-term stability of forest soils and surface topography. Eventually, as sediment moves downslope over time, increased erosion and sedimentation resulting from logging openings and soil disturbance impacts will reach area salmonid waterways, resulting in both short and long-term cumulative degradation to the area's aquatic systems. Logging will remove large wood that in time would otherwise contribute to complex stream habitat as well as upland slope soil stability, and therefore violate PACFISH and INFISH prohibitions on actions that would retard attainment of riparian management objectives. The project as planned is inconsistent with the biological opinion foundations of PACFISH with respect to salmonid species recovery and habitat protection.

The FEIS relies on faulty models absent localized information. Use of the WEPP model to analyze soil erosion has serious limitations that are not fully disclosed in the FEIS, such as: WEPP can only consider one "slope" at a time, and one "activity" at a time and does not adequately integrate multiple slopes and activities. Importantly, the FEIS aquatics cumulative impacts analysis fails to disclose the total cumulative effects of past management activities, including recent and past fires, past postfire salvage logging, burning and other fuels reduction actions, timber sales, previously clear cut areas that are

young planted stands, the reopening of closed roads, road maintenance, landings, pile burning, biomass removal, log hauling, livestock grazing, OHV use and growing impacts – including areas within the project that evidence resource degradation, etc.

In its analysis of sediment delivery, water quality, and future large wood input the FEIS failed to adequately consider and disclose steepness of slope issues, which has a direct bearing on the inevitable movement of soil and wood toward streams.
In its analysis of sediment delivery and water quality, the FEIS failed to consider the fact the RHCA buffers may be compromised by fires, ORV use, livestock grazing, and future projects, or disclose and address areas where there are existent cumulative impacts within these buffers.

In its analysis of sediment delivery and water quality, the FEIS failed to consider the fact that the removal of trees and future downed logs from upslope areas will reduce the landscape capacity for sediment storage. Standing trees and medium to large logs on the forest floor act as sediment traps, but if they are removed that function is eliminated. The FEIS failed to address cumulative impacts from livestock grazing or to disclose alternative provisions for the removal of livestock from logged and burned areas for a minimum of five or more years to allow the areas to recover post project.

The FEIS analysis of large wood and sediment failed to consider the impacts of removing hundreds of hazard trees from miles of haul roads. Since the FEIS allows removal of large logs that are felled across roads or outside RHCA boundaries, fallers are motivated to fall hazard RHCA trees toward the "money spots" (roads and upslope away from RHCAs) and away from streams where they would naturally fall and do the most good. By failing to address the incentive to log RHCAs inconsistent with the RMOs the FEIS underestimated project impacts.

Road reopening, maintenance, and log hauling will also unavoidably retard attainment of RMOs in violation of PACFISH/INFISH. BMPs are inadequate and do not assure that impacts will be avoided.

Large areas undisturbed by roads, landings, burned slash piles, and logging help protect watershed values such as soil conservation, nutrient cycling, water infiltration, and uninterrupted flow of water and materials from uplands to streams. This in turn helps ensure high quality water for listed and unlisted fish and other aquatic organisms. Logging and slash burning in uninventoried roadless and mature and old forest areas will degrade watershed values by disturbing soils and increasing erosion, disrupting nutrient cycles, and depriving streams of potential large structures. The FEIS failed to adequately disclose the full effects of logging and how it will degrade unroaded areas, mature and old forests, and aquatic systems.

With respect to water quality and salmonid populations and habitat, the FEIS alternatives, analysis, and conclusions, and the resultant ROD fail the NEPA's high quality science, reasonableness, cumulative impacts, and site-specific accuracy requirements, and as such must be withdrawn.

20. Forests & Fires – Myth and Reality

Forests throughout the Umatilla and the greater region have evolved with fire as an integral component of the forest ecosystem. The FEIS and ROD project actions pertaining to fire issues are premised upon broad brush assumptions that are not only unsubstantiated, but fail to accurately present site-specific conditions, and fail to employ high quality scientific and expert recommendations pertaining to the area's forest types and conditions.

While much of the area's forests have been significantly altered from historical ecological conditions through decades of logging, road building, and grazing, the FEIS's claim that "majority of current forest stands originated as a result of fire disturbances occurring over one hundred years ago, and they have not experienced fire since then" fails NEPA's accuracy and reasonableness requirements, and violates NEPA's expert, science, and site-specific requirements. The FEIS's assertion is unsubstantiated, with little evidence within the FEIS of the requisite site-specific surveys and methodology needed to determine whether there has been any fire occurrence in the project area within the past 100 years, or whether the area's mixed-conifer, mixed severity fire forests truly have significantly altered fire patterns. It is clear from Appellants surveys in the project unit forests that at least some fires have occurred in the area during the latter half of the 20th century, as evidenced by fire scars on standing snags and downed logs. Generally, fire cycles in more remote forest stands were not significantly altered by fire suppression actions until the late 1940's through the 1960's. Most existent mature and old characteristic trees, have generally survived one or more fires in frequent fire areas, or grown where fire cycles were naturally less frequent and extensive. The FEIS however, fails to provide such site-specific discerning information in its analysis.

The FEIS also fails to address the natural beneficial role of large-scale fires, including severe fires, and the natural mosaic patterns of large burns. Forests do not vanish from existence whole-scale due to fires. Large fires historically burned over a period of days to months. Differing wind, moisture, temperature, and weather patterns; times of burn from nocturnal to afternoon; locations of affected stands and available moisture, general topography, natural fuels breaks or high fuels levels; etc. all play integral roles in determining the mosaic of fire-caused tree mortality levels and the forest structural mosaic left in fires' wake.

Similarly, long-term cycles of moisture and climate determine the high points and low periods of fire intensity and severity as well as tree vigor and vegetative growth. These overarching patterns span not just decades, but centuries and epochs. The FEIS and ROD fail to incorporate scientific research addressing these overarching patterns, which otherwise could help put current patterns and processes into better perspective, allowing the feasible development of alternatives that work with, and not against, nature. Again, an EIS is needed for this project.

21. Restoring Resiliency.

Mature and old trees are natural components of the area's forest ecosystems, and should be retained to provide forest resiliency. The amount of old growth on the Umatilla National Forest is severely depleted well below the historic range. Retaining old growth is the best known method to accomplish the agency's stated goal to restore resiliency. Indeed, old growth develops best naturally, and despite years of efforts, there has been little if any documentation of successful management efforts to replicate, or improve upon, nature's time-proven processes for old growth "recruitment." NEPA requires the agency provide scientific support for its project actions and objectives, however, the science and evidence supporting this stated goal are lacking from the FEIS and ROD, and are at best scientifically controversial and largely already disproven.

22. Lodgepole Pine & Insects, Fires, and Natural Disturbance Processes

The FEIS premises a significant portion of its action plans on the presumed "need" and capability of logging to "restore" or otherwise positively influence lodgepole pine forest stands. However, the FEIS fails to disclose the range of scientific recommendations and research pertinent to lodgepole pine forest systems and their dependent wildlife, or for that matter any substantive science supporting the proposed logging plans. See Declaration of Richard H. Waring.

Scientific research addressing lodgepole pine ecosystems, and the role of insects was ignored by the FEIS, though such information is critical to the stated purpose and need ecological objectives. One USFS study that addressed logging to reduce the impacts of insects over a thirty year period (1920's to 1950's) concluded that these actions were infeasible as they would have to "destroy the forest to save it." See Declaration of Richard H. Waring.

Lodgepole forests' natural cyclic patterns involve a dramatic initial cycle of growth followed by increasing stand density. That is followed by corresponding insect activity and induced tree mortality and then growing levels of deadfall and fuels buildup. Indeed lodgepole pine is known for its 'jackstraw' layers of dead trees criss-crossed one above another sometimes reaching upwards of four feet or more from the forest floor. Lodgepole forests are also known for their infrequent high intensity severe fires with often near complete stand mortality. Finally, following fire, these stands naturally regenerate. Lodgepole pine are prolific seed producers, with seeds and cones well-adapted for fire survival and fire-induced seed release. The fire revitalizes soil nutrients and provides a flush of energy for the remaining vegetation. These processes are all important parts of the ongoing recurrent cycles of lodgepole pine stand regeneration and stand vigor.

Lodgepole adapted systems are unfavorable to other tree species, due to the fire and soil nutrient patterns, and the often extreme variations of localized climate, temperature fluctuations, and moisture patterns that hardy lodgepole has adapted to survive and thrive within, where other tree species cannot. As such attempts to 're-make'

nature by replacing lodgepole pine with other tree species largely are fated to failure over time. Lodgepole pine forests support a full range of natural biodiversity, with species adapted specifically to such stands. Logging and management tampering with lodgepole pine natural cycles invariably harms forest biodiversity, species viability, soils, and ecological integrity.

Yet with the Farley FEIS and ROD, the agency repeats past failed logging projects to reduce the risk of insects and fire in lodgepole pine forest systems where naturally growing stand density, insect mortality, corresponding fuels buildup, and high severity stand replacement fires are the natural ecological cyclic patterns. The area's interfacing mixed conifer and ponderosa pine forests have evolved with and adapted over time to the area's lodgepole pine stand patterns. These species edge and interface areas fluctuate in ongoing dynamic cycles of natural variability. However, the FEIS fails to disclose or address research pertinent to these patterns and issues.

The FEIS fails to assess, and needs to disclose and analyze, the consequences of disrupting natural disturbance processes in lodgepole pine and mixed conifer forest ecosystems. The agency must address pertinent scientific research assessing the costs and impacts of altering natural processes in the project's lodgepole pine and mixed conifer forests. The agency must incorporate and disclose scientific research and management recommendations pertinent to lodgepole pine systems and to mid to high elevation, north aspect, moist fir-dominant forests with less frequent but still recurrent mixed and/or high severity fire patterns. A reasonable informed legal decision approving the proposed actions cannot go forward under provisions of the NEPA absent these imperative scientific analysis disclosures and considerations.

23. Climate Change, Natural Forests Cycles, & Carbon Sequestration.

Appellants work regionally to address the current ecological problems spanning the earth. Current and future generations are suffering from the cumulative and growing repercussions from global climate change, ranging from rising sea levels, disappearing glaciers, increasingly severe frequent storm systems, and regional patterns of recurrent drought, short winters, high intensity fires

The Forest Plan has set aside these lands for what they provide to the regional ecological integrity and functioning of this ecosystem for fish and wildlife. Globally nations and people must act to protect tropical rainforests, arctic tundra, the stratosphere and the coral reefs and oceanic systems. Regionally, the Forest Service is charged with maintaining and enhancing the ecological integrity of public lands forest ecosystems

The forests of the Pacific Northwest provide for significant levels of carbon sequestration which are critically important in maintaining the natural carbon flux. Forest soils as well as forest stands are critically important carbon storage reserves. Logging and soil disturbance and exposure significantly diminishes carbon storage capacity, while natural fires and disturbance do not.

The FEIS contains a flawed, one-sided analysis that lacks objectivity or breadth. The myopic focus on timber economics will only serve to further incrementally unravel the natural ecosystems and does not ensure sustainable outputs of the multiple uses for which these public lands must be managed.

A. Introduction to Climate Change.

Recently there has been an increasing interest in using forests as a way to remove carbon from the atmosphere and store it over the long-term as part of a greenhouse gas mitigation strategy. US forests currently remove an equivalent of 12% of this nation's carbon dioxide emissions; there is excellent potential to increase and maintain this carbon "offset" as part of a bridging strategy.

The following comment sets forth, in terms as simple as possible, how the forest system stores carbon, the issues that need to be addressed when assessing any proposed action, and some common misconceptions that need to be avoided. These comments directly address numerous shortcomings in the analysis of the commercial logging aspects of the Farley project.

In testimony to Congress, Dr. Mark Harmon from Oregon State University has underscored the key carbon truths that the Forest Service must consider in analyzing climate change under the National Environmental Policy Act.

First, forests are leaky carbon buckets and are made susceptible to carbon loss through management, particularly through commercial timber harvest.

Second, forests can play an important albeit limited role in sequestering carbon.

Third, all carbon pools need to be examined when thinking through the impacts of a particular management action or policy decision.

Fourth, to increase the sequestration of forest carbon, we need to either increase carbon inputs, decrease carbon outputs, or put forest carbon somewhere else.

Fifth, forests are best seen as a bridging strategy in carbon mitigation.

Sixth, seemingly "good" forest carbon ideas when examined at the stand level at a point in time dissipate when looked at the forest level over time.

B. The Basic System: Forests as Leaky Carbon Buckets (Fig. 1-2)

Carbon is stored in multiple ways in the forest system: in the forest itself and the carbon harvested from the forest. Living plants store carbon above- and belowground. The longer lived the plants or their parts, the more that they store. This is why forests contain more live carbon than grasslands: their parts have longer lives. When plants or their parts die they start to decompose, but some carbon can be stored as dead biomass.

The slower the decomposition rate, the more that will be stored. This is why dead wood in a forest can be an important carbon store. Decomposition of dead plants eventually leads to the formation of soil carbon, which due to its relatively slow decomposition rate can accumulate to high levels. So despite a low live carbon store, grassland can store a great deal of carbon in the soil because it produces many dead roots that end up as soil. Harvest of wood and bark can also store carbon, but as with other parts of the forest system, it is subject to carbon losses, specifically during manufacturing, use, and disposal. In the case of biomass energy, the harvested carbon is theoretically stored as unused fossil fuel carbon. Given the longevity of carbon dioxide in the atmosphere and the fact that this fossil fuel carbon may be eventually burned, "carbon" biomass energy must delay the use of fossil fuels for many decades to be an effective storage mechanism.

Photosynthesis, respiration, and combustion are the major processes that control how much carbon enters and leaves the forest system. These processes interact to control the carbon store of forest systems. Forests are biological systems and as such are "leaky" with regards to carbon. That is. there is one way in which carbon comes in (photosynthesis) but many ways it goes out (respiration of plants, decomposers, and consumers, combustion, leaching, and erosion). A key concept to understand is that leaky systems can store carbon, but the amount they store is related to the amount that is coming in versus the proportion that is leaking out. By analogy a bucket with leaks can store water, but to do so it needs a constant input of water. However, the larger the leaks the less water that is stored regardless of the amount of flow into the bucket. The same can be said of a bank account; one can spend money and still accumulate wealth as long as money is put into the account. Returning to the forest system, photosynthesis is constantly causing carbon to flow into the bucket or account. Increasing the input of carbon by increasing the rate of photosynthesis will increase the average forest carbon store. Decreasing the respiration rate of plants or decomposers or the losses from combustion will also increase the average forest carbon store. However, regardless of cause these net increases will eventually slow and then cease as the forest system comes to a new balance.

Disturbance, be it natural or human-induced, influences the balance of carbon several ways. Some disturbances, such as fire, directly release carbon to the atmosphere. All disturbances convert living plant biomass into dead biomass, subjecting the forest system to additional respiration losses (essentially more leaks). Disturbance temporarily reduces photosynthesis; which means that the average carbon input to the system is decreased by disturbances because it takes some time to restore the photosynthetic capacity of forests. The effect of disturbance depends on the frequency and the severity (i.e., amount of carbon removed) of the disturbance. The more frequent disturbances appear in forest systems, the more that is removed, and hence less carbon is stored on average. Decreasing the interval between disturbances effectively increases the number of leaks in the bucket. The same effect is true for disturbance severity; the more severe the disturbance is in directly removing carbon, the less stored on average. Increasing disturbance severity effectively increases the size of the leaks in the bucket.

C. The Effects of Natural Disturbances versus Harvest (Figure 3).

Whether trees killed by fire or windstorm are logged (post-fire, post-disturbance) makes relatively little difference in carbon storage. Whenever there is a natural disturbance it is often suggested that harvesting dead trees will release less carbon than letting them decompose naturally. This is based on the assumption that natural processes will rapidly release carbon and timber harvesting will not. This assumption is not supported by the likely rates of carbon release from these two processes.

Setting aside the fact that harvest and transport of wood currently requires carbon-based energy, there is an inevitable release of carbon during the manufacturing and use of forest products.

Depending upon the type of wood product produced, the amount of carbon released during manufacturing is equal to 25-50% of the harvested amount. In many cases harvested forests are burned for site preparation, a process that removes approximately 5-10% of the forest's carbon. Combined with manufacturing losses, this means that timber harvest reduces total forest carbon stores by 10-25%.

The analysis for the Farley logging project does not account for these losses or fairly disclose and compare the effects of the No Action alternative as compared to all the action alternatives.

When products are in use, their life-span has a wide range from less than several decades to centuries. This yields a rate of loss of between 1 and 10% per year. While surprising, these values are not that different for natural disturbances. Consider the amount of loss during a fire, the natural disturbance that removes the most carbon.

A common misconception is that much of the wood burns in a fire, although if that were true there would be no debates about salvaging wood. Analysis after fire indicate that, while small material can be totally consumed, it is rare that harvest sized wood is consumed. Losses from roots and the soil are minimal.

Taking all the carbon stores of a forest into consideration, the range of carbon losses from fire consumption is roughly between 5 and 15%, generally lower than range for timber harvest and products manufacturing.

After the fire, the newly killed trees decompose. For the US, the range of wood decomposition rates for the size of material harvested is between 1 and 10% per year. That is very similar to that of forest products! Although all these numbers are approximate, they do indicate that salvaging fire-killed trees is not substantially better for carbon storage than simply allowing the trees to decompose, and in certain situations might be considerably less effective in storing carbon.

D. Meaningful Analysis of Carbon and Forests.

There are a number of general things that should be examined whenever an action regarding carbon and forests is considered. Unfortunately this has not always been the case.

> All the relevant carbon stores need to be examined. Many projects are considered from the point of view of just live carbon. This may be quite natural to do as we have the most data and understanding of live trees. However, it must be realized that other important carbon stores in forests do not behave the same as live trees. Dead trees, for example, often reach their highest store after disturbance, whereas live trees reach their lowest store at that point. By only considering live plants it is highly likely that the rate of forest carbon uptake is overestimated, in some cases by substantial amounts. A related issue is that the changes in all the carbon pools need to be considered for a total accounting. For example, harvesting wood does increase stores in the wood products pool, but it also decreases stores in the live and dead wood pool in the forest.

For the Farley Project, this means that the Forest Service must consider the effect of harvest on the pool of carbon stored in the soils. The soils store carbon for far longer than the forest vegetation does. The analysis for the Farley logging project does not disclose or analyze this readily calculable parameter.

> The starting conditions are key but often ignored. The starting and end points need to be specified. Often a proposed action gives the end point, but not the starting point. This would be similar to describing a trip by only giving the destination. One will have no idea of the direction or the distance to be traveled. For example, if one is planning on establishing a short-rotation forest plantation on agricultural land, then more carbon will be stored. Establishing the same type of plantation by converting an old-growth forest will result in a net loss of carbon to the atmosphere.

For the Farley Project, this means that the timing of the removal is critical. Otherwise, the Forest Service is using flawed accounting and the consideration of logging is skewed to favor logging when the scientific reality is that logging punches holes in an already leaky carbon bucket.

> Our actions to increase carbon stores can take decades to have a positive effect. Not every action in forests leads to an “instantaneous” response. It takes time to implement policy actions because the area involved is quite large. This means that the effect of any proposed policy needs to consider the long-term: many decades to centuries. Once treated forests take many years to adjust to any action that is imposed.

For the Farley Project, this means that it takes years to decades for a planted forest to establish full photosynthetic capacity. It also takes years to decades for the dead material created by a disturbance caused by nature or humans to decompose away. This means that temporal lags can be expected in any projected gains. Thus, it may be eventually possible to gain carbon by converting an older forest to a younger biomass

energy plantation, but it may take many decades or even centuries for this to occur. This is time we do not have.

> Forests are potentially renewable, but this is not a fixed property of forests. It is generally assumed that forest related carbon in the form of wood and biofuels are renewable. There is logic to this in that trees can be harvested and can regrow. Resources that can regrow are potentially renewable, but a resource is not renewable automatically because it is grows or is a tree. To determine if a resource is renewable we need to compare the regeneration and removal rate. We also need to understand that removal of trees can and does affect carbon pools other than trees like the pool of carbon contained in the soils.

For the Farley Project, this means that the agency should take into account how much the soil declines when trees are harvested. Given that the agency cannot just consider the trees, but must assess the impacts on the entire forest system, the agency must compute how harvesting a renewable resource likes trees leads to a non-renewable loss elsewhere in the carbon system.

> Forests are systems that have feedbacks which can strongly influence carbon effects of actions. For example, increasing the growth rate of trees can lead to higher carbon stores in forests, but a larger live tree store also means that more plant material will die during the course of forest growth or harvest. More dead plant material means more losses via decomposition or combustion if there is a fire or harvest.

For the Farley Project, this means that the gains from increases in forest growth feedbacks to result in decreased net carbon increases in time. As another example, it has been stated that forest fire frequency and severity will increase in the future. That may be the case, but it also should be noted that it is generally difficult to increase the severity and frequency of fires for any length of time, in part because more frequent fires eventually lower the fuel level, and fuel level is related to fire severity.

There is plenty of readily available scientific literature on this topic.

> Estimating carbon effects of policies need to look at whole forests over time, not single stands at a point in time. The way a forest system behaves depends on how large an area that is considered and how long a time period it is considered. Perhaps no other issue, termed scale by ecologists, has lead to so much confusion and frankly wrong-headed notions in terms of forest carbon management.

For the Farley Project, this means that while the agency may acknowledge that young forests of a certain age do remove more carbon in a course of a year than an older forest. However, this would only be useful information if forests never changed their ages. The high rate of uptake of some young forest occurs because even younger forests have lost carbon. Since one can not have a young forest without have an even younger forest, comparing the just one year in the life's forest is completely misleading. Recall that when forests are disturbed by nature or humans the forest initially loses carbon. Over

a long time period forests gain carbon and eventually lose some of it when disturbed again. If the average carbon stores of a young forest is compared to that of an older forest, then one finds that the older forest stores a good deal more carbon. Therefore one is unlikely to gain carbon from the forest site if one converts from an older to a younger forest system.

The analysis of the Farley logging project makes this flawed assumption and bases its management choice on this flawed assumption. When one considers a small plot of land, the carbon balance seems to moving from losing to gaining to losing carbon over time. However, when one considers many plots of land that are going through these cycles at different times, then one sees a relatively steady store of carbon.

This is analogous to a bank in which one person puts in funds and another removes them. As long as there is not a run on the bank, the amount of funds is relatively constant (at least that is the hope). This is quite relevant in terms of carbon policy, because land owners will see boom and bust cycles in their carbon stores and this may make buying their carbon credits very unappealing. If many owners aggregate their carbon projects, then it is possible for the buyer to see a steady store or supply of carbon.

E. Using Forests to Sequester Carbon from the Atmosphere: Increase Carbon Inputs, Decease Carbon Outputs, or Put Forest Carbon Somewhere Else.

Forests in the United States are currently removing carbon from the atmosphere and are likely to remain doing this for some time, perhaps decades. Eventually, as in all leaky systems, the rate of carbon removal is likely to slow and eventually cease. At this point the forest will be in rough balance with the amount coming in about equal to the amount going out. This "saturation" behavior is one reason forests are considered a bridging strategy and not a lasting solution to the problem of reducing greenhouse gas emissions.

To continue and enhance the removal of carbon by forests, it will be necessary to take direct actions. Put simply, to remove more carbon from the atmosphere with forests it will be necessary to increase the average amount of carbon that forests store or increase the efficiency or manufacture of wood products and the length of their storage in use. As stated above, the average carbon store as well as the carbon balance of any forest is controlled by the amount input via photosynthesis versus the amount lost via respiration (e.g., plants and other organisms such as decomposers) and the amount lost via combustion. Both the average carbon store and the carbon balance vary over time, in part, because the factors controlling photosynthesis, respiration, and combustion vary over time. Therefore it is useful to distinguish between short-term and relatively minor variations in forest carbon caused by yearly variations in climate versus those caused by changes in policy or long-term changes in climate. It is the latter two that will change the balance and store of carbon in the long-term.

Before presenting the range of possible management options it is worth reminding ourselves that carbon is not the only reason we manage forests. Forests provide humans clean water, habitat for many animals, plants, and other organisms, harvested goods of all sorts, recreation, and many intangible benefits. Not all these objectives will be compatible with maximizing carbon stores in forests. Moreover, there are certain management actions such as thinning certain forest types (e.g., lower elevation dry type Ponderosa pine as opposed to moist mixed conifer and sub-alpine fir types) that may be necessary to maintain these forests despite the fact that carbon stores will be decreased. We can not be so single minded about carbon that we create a host of other problems.

There are many proposed steps and multiple viable strategies and that can be taken with regard to increasing forest carbon. Admittedly this can be confusing for those looking for a "one-size fits all" approach. On the other hand it does offer flexibility that will allow one to tailor approaches with specific situations on the ground. Essentially one can increase carbon stores of by increasing the input to the forest, decreasing the output from the forest, putting the carbon from the forest somewhere else, or some combination of these.

F. Top Environmental Concerns Regarding Climate.

The United States forests are currently removing carbon from the atmosphere and in offsetting greenhouse gas emissions. Within this context, Appellants point out several key concerns which the Forest Service has not disclosed or analyzed in the FEIS.

To have forest play a greater role than they do currently, we will have to do something different than business as usual. We must assure that additional carbon is stored due to new actions, a concept usually called "additionality." Despite the need for this concept, it must be acknowledged that it means those with practices that have lead to the lowest carbon stores have the most to benefit from changing their practices. The role of those that have already changed practices or have always managed in a manner to keep carbon stores high has to be recognized and encouraged. Little will be gained if the only way to have carbon store increases counted is to first lower carbon stores. Given the time lags inherent in the forest system, this will be totally counterproductive.

Making sure carbon stores are real: the need for a national accounting, verification, and monitoring system. Appellants submit that the Forest Service should prepare itself to be able to measure whether any gains in forest carbon stores are real. If the agency cannot even get the basic carbon truths right then how can it field monitor or ever verify its strategies both in the short- and long-term?

The Forest Service needs to do so at two levels. The first would be at the level of specific projects. The second would be at a national level, which would involve more than simply adding up all the projects, in part because there will be many forest areas without carbon projects that need to be considered in the national balance sheet. The often stated claim that methods do not exist to monitor changes in forest carbon is completely puzzling given that scientists developed these methods decades ago. There

are many existing methods and systems that can be modified to achieve the goal of monitoring and verification. While these methods could be substantially improved with further investments, there is readily available information to start the process now.

National guidelines or protocols, similar to those developed by California, would greatly aid in assuring monitoring and verification is trustworthy. At least at the project level, where the goal is to support a carbon credits market, these protocols can be flexible as long as there are discounts or deductions for uncertainty about how much additional carbon is being stored. That way the project managers can decide the tradeoff between the gain in carbon by lowering uncertainty versus the cost of a more expensive and comprehensive measurement program. It should also be noted that these estimates of carbon gains need to be conservative, because failing to count storage will do far less environmental harm than over-counting.

Despite the potential for forests to contribute to the challenge of reducing our nation's greenhouse gas emissions, Appellants do recognize the forest system's limits in this regard. Even if we could double the current rate that forest's are removing atmospheric carbon, it would amount to approximately 20% of the current fossil fuel release of carbon dioxide. This is quite important, especially since it can be achieved with largely with today's technology. Plainly stated, Forests can not be used to solve the entire problem.

The greatest concern for the Umatilla National Forest is that with continued warming forests can shift from being part of the carbon solution to being part of the carbon problem. Forests are currently storing considerable carbon in the United States and are currently offsetting approximately 10% of the nation's carbon dioxide emissions. Forest systems can be managed in a wide range of manners to sustain and perhaps even increase their ability to remove carbon from the atmosphere. Some of the actions being proposed will definitely not store more carbon in forests, but there are many that will.

To assure that forest projects in fact remove atmospheric carbon, it is essential that the actions proposed in the Farley project conform to rigorous scientific principles. The proposal in Farley does not provide assurance that that increases of carbon stores will be realized over time.

Forest systems can be a good share of the nation's solution to decreasing the accumulation of carbon dioxide in the atmosphere, but they can not be used alone. It is highly likely that unless other steps are taken that the positive role that forest could play will become diminished and even switch to a negative one. The Forest Service has a duty to make sure that actions taken to increase the role of forest as carbon stores does not create other problems in terms of what we expect forests to do for us. Rather than using value laden terms like "forest health" Appellants submit that the Forest Service should disclose and apply the best available science, which informs the public that:

> Reducing the amount of fuels to try to reduce losses from fire reduces carbon stores. Why? Because the fuel is carbon and the soils are impacted by roads, landings and pile burning!

> A forest with dead trees, fungi, fire and insects is healthy in that it is full of biodiversity and supports fish and wildlife.

> A burned forest is a biodiversity hotspot and enhances fish and wildlife.

> Active forest management also releases carbon!

> Actively managed forests also burn!

> Very young forests release carbon and do not start taking up carbon on a net basis for 5-50 years.

Appellants ask the Forest Service to disclose and analyze the losses that occur from managing the system through commercial logging and not downplay the carbon uptake from the natural unmanaged. Otherwise, the agency is cooking the books. Appellants have included the best available peer reviewed sources from top scientists for your reference.

The Farley Record of Decision claims that due to the lack of federal standards, regulatory policy, and federal statutes it is impossible to determine the impacts of the Farley Project on climate change and carbon sequestration. The FEIS must be withdrawn, and new requisite analysis conducted that responsibly addresses the readily available scientific information on climate change, forest vegetation and soil carbon sequestration.

The Figures 1-8 (attached hereto) plainly illustrate the key issues in considering climate change, forests, and carbon sequestration in relation to this project. These figures are from "Testimony before the House Subcommittee on National Parks, Forests, and Public Lands…" delivered by Mark Harmon, PhD, March 3, 2009 (Complete testimony included). In this vein, the following table shows a summary of possible actions to increase carbon stores in forests. For those actions with large ranges, the underlying factor causing the range is noted. The Forest Service should provide a similar table in comparing the analyzed alternatives.

Action	*Odds of Positive Result*	*Potential Area Involved*	*Pairs Best with*	*Trades off with*
1. Slow deforestation	High	Low to Moderate	3, 4	7, 8, 9
2. Afforestation on former forest lands	High	Moderate	7, 8, 9	6
3. Lengthen interval between Harvest	Moderate to High Depends on time added	Moderate to High	1, 2, 4	7, 8, 9
4. Reduce amount	Moderate to High	Moderate to High	1, 2, 3	7, 8, 9

harvested	Depends on degree			
5. Increase growth of trees	High	High	3, 4, 7, 8, 9	
6. Fuel reduction on wildlands	Low	Moderate	7	3, 4
7. Wood-based Biomass energy	Low to High Depends on starting point	Moderate	2, 5	1, 3, 4
8. Wood products	Low to High Depends on starting point	Moderate	2, 5, 9	1, 3, 4
9. Substitution of wood for other materials	Uncertain	Moderate	2, 5	3, 4

The absence of disclosure of climate change implications of a federal project renders the analysis legally deficient under NEPA. For example, in November of 2007, the Ninth Circuit Court of Appeals held that a federal agency, the National Highway Traffic Safety Administration (NHTSA), had violated NEPA by failing to consider - in its environmental analysis document - the cumulative impact of carbon dioxide emissions on global climate change. The Court stated that "[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct." Ctr. for Biological Diversity v. Natl. Hwy. Traffic Safety Administration, 508 F.3d 508, 550 (9th Cir. 2007) replaced by Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1217 (9th Cir. Cal. 2008). In the subsequent case, the Court made the same ruling regarding the need for federal agencies to consider the impact of greenhouse gas emissions on climate change and global warming.

The Court did not find persuasive the agency's argument that many other factors outside of its control are causing climate change. On the contrary, the Court stressed the importance of addressing individual incremental actions that foreseeably and collectively contribute to climate change. Notably, the Court relied heavily on National Forest jurisprudence for its analysis. Id. The Ninth Circuit's decision followed a similar district court decision holding that the U.S. Fish and Wildlife Service violated the Endangered Species Act by failing to consider the environmental impacts of climate change in its environmental assessment document (the Biological Opinion). *Nat. Resources Def. Council v. Kempthorne*, 506 F. Supp. 2d 322 (E.D. Cal. 2007).

The Ninth Circuit's decision also followed only months after the U.S. Supreme Court acknowledged the reality of global climate change in a decision holding that the

U.S. Environmental Protection Agency had authority to regulate greenhouse gas emissions under the Clean Air Act. Massachusetts. v. Environmental Protection Agency, 127 S. Ct 1438, 1459-60 (2007).

Noting the "enormity of the potential consequences associated with [human-caused] climate change," the Supreme Court stated: "While it may be true that regulating motor-vehicle emissions will not by itself reverse global warming, it by no means follows that we lack jurisdiction to decide whether EPA has a duty to take steps to slow or reduce it. A reduction in domestic emissions would slow the pace of global emissions increases, no matter what happens elsewhere." *Id*. at 1458.

The guidance from President Obama on Scientific Integrity and the applicable guidelines from CFR 1502 require a harder look at this key issue.

To assist in your consideration we have included the Declaration of Richard H. Waring and the associated scientific works that are available on his website and our undoubtedly housed by the Research Station arms of the Forest Service. Appellants urge you to carefully consider the implications of:

- Avifaunal Response to Fire, N. Kotliar et al, 2007
- Oregon Biodiversity in a Changing Climate, J. Lawler et al, 2008;
- Public land, timber harvests, and climate mitigation: quantifying carbon sequestration potential on US public timberlands, Depro et al, 2007;
- Testimony before the House Subcommittee on National Parks, Forests, and Public Lands… M. Harmon PhD, March 3, 2009;
- Forest fuel reduction alters fire severity and long term carbon storage in three Pacific Northwest ecosystems. S. Mitchell, M. Harmon, K. O'Connell;
- 50 Year Trend in June Temperature, 1951-2006, E. OR, E. CA, ID, S.W. MT, NV, UT, W. WY
- *Impacts of timber harvesting on organic matter*, M.F. Jurgensen, 1996;

Appellants refer you to the recently released government science report on climate change: http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/. The readily available data on climate trends and the readily available data on actual carbon release from management disturbance as compared to natural disturbance must be disclosed and analyzed in the alternatives considered in the FEIS.

24. Fire Management.

The FEIS and ROD fail to meaningfully incorporate utilizing scientifically recommended strategically placed land area treatments – SPLATS (or SPOTS, etc.). Without fully analyzing an alternative that minimizes the extent of acreage manipulated by management actions, and thereby save limited resources while protecting natural habitat, the Forest Service and the public will never fully know how the ecological

objectives of the project actions could be attained without widespread commercial logging. The Forest Service cannot make an informed decision without full analysis of small diameter strategic SPLATS-style thinning and restorative actions.

25. Fire Regime Condition Class Inherent Failures

The Forest Service uses models are not based in best available science. It relies heavily on Fire Regime Condition Class (FRCC), which is a highly controversial method of determining the ecological status of a forest. (Morrison and Smith, 2005) The FRCC model is overly simplistic and is based on subjective estimates and guesses about the general fire regime over a large landscape. *Id*. "The use of the FRCC model as the primary basis for forest and landscape planning is an oversimplification of complex systems and does not make use of the best available science." *Id* at 9. The FRCC model also assumes that a land manager can reduce the risk of fire by changing the condition of the forest to Class 1. "However, this idea does not have adequate support in practice and is currently the subject of much scientific controversy." The FEIS fails to adequately address the scientific controversy surrounding the use of Fire Regime Condition Class or the model methodology used in its fire risk modeling for this project.
The FEIS states the following unverified premise based upon FRCC:

"Fire regime condition classes, which describe deviation from natural fire regimes in terms of fire return intervals and vegetative change from historical composition and density, have been modified in the project planning area due mainly to past harvest history and fire suppression. Approximately 40 percent of the project planning area has changed from a historical fire regime (Class 1) to a moderately altered fire regime (Class 2) and 10 percent of the area has changed to a significantly altered fire regime (Class 3)."

It is notable that even given the inaccuracies ascribed to using FRCC, the FEIS acknowledges that only 10% of the area has changed to class 3, with 40% only moderately altered from original fire patterns, leaving half of the area within class 1. Even without consideration of the flaws inherent in using FRCC, this calls into serious question the "fire-risk" reduction "need" for this project at all – especially given more priority WUI areas nearer human communities, and limited agency and public resources.

Fire-regime condition-class (FRCC) is a measure of increasing departure from natural conditions due to altered fire regimes (missed fire cycles). In this respect, increasing departure merely means that the forest has had more time to grow since the last fire, and the agencies assume that this means that fire hazard has always increased, which may or may not be true. Forest growth may cause either higher or lower fire hazard.

Column A –factors indicating <u>increased</u> fire hazard due to forest growth	**Column B –factors indicating <u>decreased</u> fire hazard due to forest growth**
More surface fuels	Taller trees with higher canopies out of the way of surface fire
Increased mortality	Self pruning of lower branches that raises canopy base height
Increased growth of shade tolerant ladder fuels	Trees with thicker bark
Increased canopy bulk density	Increased canopy cover that suppresses growth of surface and ladder fuels
Increased fuel continuity	Increased canopy cover that reduces temperatures in the understory
	Increased canopy cover that reduces wind speed
	Increased canopy cover that increases humidity
	Increased canopy cover that maintains fuel moisture
	Increased canopy cover
	Mortality and canopy gap dynamics that increase spatial heterogeneity and discontinuity of fuels

The agencies apply FRCC in a way that assumes that the factors in column A always outweigh the factors in column B, so that missed fire cycles and increased forest growth always leads to increase fire hazard, but this is assumption is almost never questioned and is clearly not always the case. According to the FRCC definitions, fire behavior and effects may be "more or less" severe with increasing departure. http://www.nwcg.gov/teams/wfewt/message/FrccDefinitions.pdf

Furthermore, there is direct evidence from northern California to support the idea that fire hazard actually decreases rather than increases with time since fire. Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, California. Conservation Biology 18(4): 927-936. http://nature.berkeley.edu/moritzlab/docs/Odion_etal_2004.pdf

26. The FEIS Fails to Identify the "Best Available Science" That Supports Logging in LOS Stands That are Barely Within HRV to Convert Multi-Storied Old Growth Forest to Single Storied Stands.

The National Forest Management Act's (NFMA) implementing regulations require the consideration of the "best available science" for all site-specific projects. 36 C.F.R. § 219.11 (2008); 36 C.F.R. § 219.35(d)(2000). Under the 2008 NFMA regulations, this requires documenting "how the best available science was taken into account in the planning process within the context of the issues being considered;" and "that the science was appropriately interpreted and applied." 36 C.F.R. § 219.11(a). The FEIS does not identify what the "best available science" is or entails, with respect to the Forest Service's decision to log multi-story old growth stands, which are only barely

within the HRV threshold for that forest type, in order to convert those stands to a slightly more deficient forest type. The FEIS must demonstrate how the "best available science" standard was considered with regards to this proposal. Numerous courts, including the Ninth Circuit have held Forest Service decisions to be arbitrary and capricious where there was nothing in the record that explained what "best available science" entails or how it was considered in developing aspects of the challenged timber sales. *Bark*, 2007 U.S. Dist. LEXIS 21272 at *19-20; *Forest Watch v. U.S. Forest Serv.*, 410 F.3d 115, 117 (2nd Cir. 2005); *Ecology Ctr., Inc. v. U.S. Forest Serv.*, 451 F.3d 1153, 1191, 1195 (10th Cir. 2006).

27. The FEIS and ROD Failed to Thoroughly Discuss the Scientific Uncertainties Associated with Logging in LOS Stands to Convert Multi-Storied Old Growth Forest to Single Storied Stands.

The Forest Service's attempt to approximate some historic condition may not be appropriate for this environment due to overall changes across the forest as a result of past logging and other management; other variables, such as continued fire suppression, may impact treatment outcomes; and treating old growth is fundamentally different from and may disrupt natural processes. As a recent study from the PNW Research Station points out, "[w]hile historical information offers insight into one resilient forest condition, there may be other equally resilient targets that managers may choose, particularly given the fact that the future climate may not resemble the past." Youngblood, PNW Research Station, Science Findings (September 2008).

Our organizations have commented on numerous projects that reflect the Forest Service's recent policy trend to log in Eastern Oregon's old growth stands based on the purported need to convert multi-story old growth to single-story old growth. The FEIS and ROD fail to acknowledge and discuss the high level of uncertainty with respect to the long-term ecological consequences of this management prescription for LOS stands, particularly given that most areas are also deficient in multi-story old growth (as seen with many recent projects calling for amendments to the Eastside Screens to "treat" these areas) or are just barely within the HRV for this forest type (as is the case here). This discussion is essential in order for the Forest Service to demonstrate that it took the requisite "hard look" at the environmental consequences of its proposed action under NEPA. The Ninth Circuit has held that the Forest Service's failure to disclose the scientific uncertainty of its decisions to "treat" old growth forest violated NEPA. *Ecology Ctr., Inc. v. Austin*, 430 F.3d 1057, 1065 (9th Cir. 2005); *Lands Council v. McNair*, 2007 U.S. App. LEXIS 15749, *13 (9th Cir. July 7, 2007).

In *Ecology Center*, the Forest Service sought to "correct uncharacteristic forest development resulting from years of fire suppression." *Id*. at 1063. This "treatment" was "designed to leave most of the desirable old-growth trees in place and to improve their health." *Id.* Although treatment may be designed to restore old-growth to 'historic conditions,' . . . this can be a misleading concept: for example, information regarding historic conditions is incomplete; altering particular sections of forest in order to achieve "historic" conditions may not make sense when the forest as a whole has already been

fundamentally changed; many variables can affect treatment outcomes; and the treatment process is qualitatively different from the 'natural' or 'historic' processes it is intended to mimic. *Id*. (*citing* Plaintiffs' arguments).

The Ninth Circuit concluded that the Forest Service violated NEPA because it "treat[ed] the prediction that treatment will benefit old-growth dependent species as a fact instead of an untested and debated hypothesis" and it failed to "'address in any meaningful way the various uncertainties surrounding the scientific evidence' upon which the decision to treat the [] old-growth rests." *Id*. at 1065. Although, the Ninth Circuit recently overruled *Ecology Center*, to the extent it suggested that the Forest Service always violates NEPA every time it fails to address some scientific uncertainty in its analysis, it reaffirmed that the agency must at least acknowledge and respond to comments by outside parties that reasonably state such uncertainties exist. *Lands Council v. McNair*, 537 F.3d 981, 1001 (9th Cir. 2008).

Leaving aside whether there is actually severe deficiency in single-story old growth or the validity of the proposition that stands that were historically single-story may have shifted to more multi-storied conditions due to past management and fire suppression, what remains unconvincing is whether logging in LOS stands that in this case are barely within HRV in order to convert multi-storied old-growth forest to single-story stands is the appropriate solution, particularly when both forest types are lacking and the latter is stated simply to be more severe. However, this conclusion lacks substantiation in the FEIS. Further, given the agency's clear misrepresentation of site specific HRV conditions of most of the project area, where these are instead multi-strata mixed conifer and including moist mixed conifer, rather than single strata, such conclusions are highly suspect as to their veracity. Again regardless of this, as we have suggested in past comments, this logic is akin to "robbing Peter to pay Paul."

The FEIS acknowledges that while species that prefer more open, single-story old growth habitat may benefit from this conversion, it would likely be to the detriment of other species that are more associated with multi-storied old growth, such as pileated woodpeckers, goshawks and pine marten. Furthermore, the FEIS admits multi-story forested stands are important to elk because of their heavy use throughout the year, but it does not integrate these costs into its decision.

The agency has been taking a piecemeal, project-by-project approach. When this approach is coupled with unknown future climatic changes, this approach gives rise to significant uncertainties in terms of broad-scale, long-term ecological consequences. The NEPA process is intended to ensure "that important environmental consequences will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." *North Buckhead Civic Ass'n v Skinner*, 903 F.2d 1533, 1539-40 (11th Cir. 1990).

28. Reduced Habitat Connectivity.

The FEIS indicates that patch size and arrangement of old forest stands have been reduced in the past 50 years. Wildlife species associated with this habitat likely have larger home ranges, are more susceptible to predation, and expend more energy for survival. Nevertheless, the selected alternative calls for extensive thinning within connective corridors which would further reducing satisfactory cover to the minimum Forest Plan.

Wildlife survival depends on movement – whether it be day-to-day movements, seasonal migration, gene flow, dispersal of offspring to new homes, recolonizing an area after a local extirpation, or the shift of a species' geographic range in response to changing climatic conditions. For most animals and plants, all of these types of movement require a well-connected natural landscape. See Western Governors' Association's, Wildlife Corridors Initiative (June 2008 report), p. 2. There is abundant scientific evidence that loss of habitat connectivity has profound negative impacts on fish, wildlife and plant populations. Id. at 3 (citing Wilcove et al. 1998, Crooks and Sanjayan 2006). Alarmingly, habitat loss and fragmentation is a cause of decline for about 83% of U.S. species that are becoming more rare. Id. at 4 (citing NatureServe and TNC 2000).

This vital role that habitat connectivity plays in ensuring long-term species' viability and the disastrous effects of habitat fragmentation has inspired a growing call to action to address these issues through big-picture collaborative efforts. A primary example is the Western Governors' Association's (WGA) recent adoption of Policy Resolution 07-01 (adopted February 27, 2007), Protecting Wildlife Migration Corridors and Crucial Habitat in the West and preparation of the Wildlife Corridors Initiative (June 2008 report).

This growing concern over connectivity and further habitat fragmentation gives rise to the need for federal land managers to look beyond meeting minimum forest plan standards for individual projects, as the case seems to be here. Rather, the Forest Service should assess how each project has the potential to affect wildlife connectivity on a broader scale, meaning at least at the forest-wide level. Connectivity concerns are heightened in this area due to the fact that the project planning area is near Wilderness areas and inventoried roadless areas. While the FEIS claims Eastside Screens direction for connective corridors will be met, it fails to substantiate such claims by either accurate site-specific information or applicable scientific research pertaining to the cover needs of imperiled interior forest species.

29. Roads, Soils, and Invasive Weeds.

Among major environmental concerns are the amount of road building and reconstruction involved in the selected decision to log the area. Roads, even if "temporary" by description pertaining to use, have significant long-lasting harmful affects on the environment. There is abundant science dealing with the adverse affects of

roads on wildlife and watersheds. Such impacts include habitat fragmentation, soil compaction/erosion, sedimentation, introduction and spread of invasive weed species, increased likelihood of off road vehicle abuse, and increased risk of fire, to name a few.

Road density is correlated with wildlife habitat effectiveness and quality of fish habitat; the more roads, the greater the likelihood for sedimentation, disruption of hydrology, and the elimination of wildlife security. While it is helpful to an extent that this project does not plan logging activities within RHCAs, and claims to provide adequate stream buffers, research on the actual impacts of such logging does not support the agency's findings of no significance or no adverse harms. Despite such measures however, the FEIS acknowledges:

"Roads have deleterious effects on habitat effectiveness by taking habitat out of production (1 mile = 4 acres of land), reducing the effectiveness of cover, and increasing disturbance to elk and other wildlife. Elk have been found to select habitats preferentially based on increasing distance from open roads (Rowland et al. 2000). Vulnerability and hunting mortality have been found to be higher in stands with greater road densities and less hiding cover (Weber et al. 2000)."

Open road densities are already fairly high in the planning area. Moreover, the UNF has been using an outdated model for determining open road density standards, which only counts permanent roads open to full-size vehicles. However, with respect to resource impacts, it makes far more sense to apply a methodology that accounts for all motorized routes—that is, one that includes so-called "temporary" roads as existent skid trails, "ghost roads" existent but not on system maps, as well as roads/routes only accessible to ORVs. This approach is supported by an abundance of scientific evidence demonstrating that temporary roads are not temporary in impact and that roads only open to ORVs can contribute to equal or even greater adverse impacts than roads only open to full-size vehicles.

Elk tend to avoid areas near open roads and ATV routes (Edge and Marcum 1991, Wisdom 2007). Recently, another study reported preliminary results suggesting the ATVs are causing a shift in the spatial distribution of elk in Oregon (Wisdom 2007).Elk vulnerability and mortality from hunter harvest, both legal and illegal, increases as open-road density increases (Unsworth 1993; McCorquodale et al. 2003). In areas of higher road density, elk exhibit levels of stress and increased movement rates (Rowland et al. 2005).

Humans often continue to use these roads long after the supposed expiration of their temporary nature. Soil compaction/ disturbance and sedimentation impacts may continue to persist. The natural recovery process can take decades. In the interim, once a road has been established, it is likely to continue to be used, resulting in significant environmental impacts.

The FEIS purports to disclose road impacts, but Appellants do not believe that these figures include recent "temporary" roads that are still impacting the landscape in

terms of their effects, even if they have been administratively closed to use. And although some roads are now "closed," the action alternatives call for reopening miles of closed roads. Of even greater concern is the selected alternative's authorization of miles of temporary road construction. This combination of reopening old unused roads and "temporary" road construction will result in further habitat fragmentation and remove areas of vegetated wildlife security. See Declaration of Jonathan J. Rhodes.

As a result of these road associated adverse effects, the Forest Service should have focused actions on reducing these impacts through decommissioning and true restoration, turning more road miles to trail miles, not building new roads. This project, and many others like it, is largely supported by the alleged need to reduce the risk of wildfire, insect outbreaks and disease. To a limited extent, these concerns may warrant some degree of a proactive response in certain cases, such as within appropriate plant association groups and within scientifically supported parameters. Yet the agency acknowledges within their FEIS that PAGs where limited thinning may be beneficial do not exist within the project area's units. Further,, the Forest Service focuses too heavily on those risks that are purportedly met with timber harvest prescriptions, and thereby produce commercial timber products (i.e. insects, mistletoe, wildfire), while at the same time downplaying the fact that the logging it "prescribes" to "treat" those risks, gives rise to a whole suite of other risks—among major concerns being detrimental soil impacts, fragmentation, habitat degradation, increased fire risk, and the spread of invasive weeds, etc. The Forest Service should not lose sight of these concerns because of its interest in logging. Indeed, healthy soil is the foundation of a healthy forest ecosystem (Coleman, et al. 1992; Klopatek, et al. 1993).

Invasive weeds have the potential of being an even greater serious problem in the planning area and the problems posed by their introduction and spread in general are well documented. Central to solving this problem is halting activities that further perpetuate the conditions where invasive weeds thrive. Logging equipment and exposed soil mean more vectors for invasive plants. Once introduced, they are very difficult to eradicate. This issue should have been given serious attention, particularly given the level of livestock grazing, the high influx of vehicles and humans, and the extent of ground disturbing logging and related project actions that the agency plans within the project area. The FEIS and ROD note a list of measures to mitigate these risks, but fail to disclose the effectiveness and applicability of such measures. The new EIS must identify the success rate of these measures and substantiate claims with verifiable supporting data.

30. Soils Provide Foundational Communities.

The FEIS and ROD failed to sufficiently recognize the importance of mycorrhizal fungi on forest growth and productivity. The FEIS failed to adequately discuss how mycorrhizae will be impacted by the planned logging project. The FEIS failed to sufficiently assess how logging has affected mycorrhizae in areas nearby the analysis area. Mature and old growth forests within the project area are rare within the Umatilla, and must be protected from adverse logging impacts. Scientific evidence suggests that mycorrhizae and other soil organisms and processes are extremely important and are

easily destroyed by ground-based logging, including thinning using BMPs as well as post-logging subsoiling, which devastates subsurface soil microbial communities upon which healthy functioning forests depend.

Affected wildlife species, including prey species for raptors and predators also rely on the fungi, but there is no discussion of how the project will affect this important food source for these species. Without an adequate discussion of the impacts to soil mycorrhizae, including the harmful impacts of ground-based logging, subsoiling, and ineffectiveness of BMPs; the public and the decisionmaker are precluded from making an informed decision regarding the proposed project, and the USFS cannot assert that there will be no permanent impairment of the soil. 30 C.F.R. §§ 219.27(a)(1), 219.14(a)(2) (prohibiting activities unless technology is available to prevent impairment of soil or water resources).

Soil research and surveys of similar projects confirms the project will have detrimental impacts on soil, including destruction of microbiotic organisms, soil compaction, and soil erosion. The FEIS and ROD fail to fully address these harms. Use of low impact light equipment in appropriate areas is also not adequately addressed or incorporated in project actions. As the major purpose and need premise for this project is recovering forest resilience, protection and restoration of ecologically foundational forest soils should have been a paramount priority for this project. The FEIS and ROD must be withdrawn and a new EIS conducted.

31. Biomass.

The FEIS fails to adequately address and disclose the extent of potential adverse impacts from excessive biomass utilization as part of this project. Short-term scientifically non-controversial restoration methods should be the only basis for biomass inclusion in this project. Limited, ecologically beneficial biomass utilization should not result in adverse harms to forest ecological integrity, functioning, and/or wildlife habitat needs. Additionally, in areas where whole tree yarding is planned, and elsewhere where the mix of commercial logging and non-commercial thinning would generate significant quantities of pile concentrated slash, the FEIS and ROD failed to address the adverse impacts of such piles, and the infeasibility given the economic realities of both the chip and biomass markets, and the distance of the project area from production facilities. Piles if left concentrated in the forest, or scattered throughout the forest floor, will significantly increase the risk of severe fires throughout the project area and surrounding forests. If burned, large piles carry an inherent risk of fire spread. Pile burning sterilizes forest soils, requiring many decades to centuries for soil community recovery. The FEIS and ROD authorize project actions that are inconsistent with the ecological objectives of the stated purpose and need, and must be withdrawn.

32. Benefits of Insect Presence.

Fire is a natural part of the ecosystem, especially in the drier forests found east of the Cascade crest. Decades of fire suppression and mature and old growth logging have

contributed to dense, overstocked forests that may be more susceptible to catastrophic wildfire. However, when a mature tree is removed by logging, it is replaced by fire-prone brush and small diameter trees. The project's logging would repeat these past errors, increasing the risk of severe fire in this area.

Bark beetles are natural processes that have benefits in the natural succession of the forests. *See* Logging to Control Insects, Scott Hoffmann Black, 2005

The FEIS failed to address the important natural roles and benefits of these components. Instead beetles are being used as scientifically insupportable excuses for excessive harmful logging actions. The FEIS needs to correct these inaccuracies and revise the project to provide for the appropriate of insects.

33. Understanding the Importance of Snags.

The Forest Service now recognizes that current methods and assumption concerning snag habitat are outdated. Oregon Wild has submitted an appeal with extensive and detailed information on this problem and the Appellants hereby incorporate those reasons by reference into this appeal.

The agencies need to consider a replacement method for maintaining species and other values associated with dead wood. This is especially critical because adequate dead wood is recognized as an essential feature of healthy forests and the Forest Service has identified numerous "management indicator species" associated with dead wood habitat. This suggests the current direction of managing for 100 percent population potential levels of primary excavators may not represent the most meaningful measure of managing for cavity-nesters and that these snag levels, under certain conditions, may not be adequate for some species.

Other forms of decaying wood, including hollow trees, natural tree cavities, peeling bark, and dead parts of live trees, as well as fungi and mistletoe associated with wood decay, all provide resources for wildlife, and should be considered along with snags and down wood in management guidelines. The ecological roles played by wildlife associated with decaying wood extend well beyond those structures per se, and can be significant factors influencing community diversity and ecosystem processes. Rose, C.L., Marcot, B.G., Mellen, T.K., Ohmann, J.L., Waddell, K.L., Lindely, D.L., and B. Schrieber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management, Chapter 24 in Wildlife-Habitat Relationships in Oregon and Washington (Johnson, D. H. and T. A. O'Neil. OSU Press. 2001)

For guidance on how the Forest Service might proceed see Exhibit G.

34. The Farley FEIS and ROD Fail the Scientific Integrity Requirements of the NEPA and the directives of President Obama's Memorandum of March 9, 2009.

President Barack H. Obama recently issued a memorandum which further re-affirms the mandates of federal environmental laws. The President has ordered all federal agencies to provide credible scientific research and established scientific recommendations in support of their proposed actions. What the President has affirmed is especially important in the aftermath of eight years of Bush administration-directed malfeasance guiding federal agencies, including the United States Forest Service, in systemic management failures violating the scientific and accuracy requirements of NEPA and other federal environmental policy laws. It is necessary for unlawful projects such as Farley, which began their development under the Bush era, to be reassessed and revised to meet the legal requirements of NEPA and other federal policy laws.

The Farley Project FEIS and ROD lack scientific basis, and fail to disclose the full range of credible scientific recommendations pertinent to the project's purported purpose and need ecological objectives. These significant scientific, ethical, and legal issues have been clearly articulated in this appeal and in our prior comments on the FEIS as well. The Forest Service was provided with a wealth of pertinent scientific studies, and explanations in our comments concerning these issues, and chose to ignore the requirements of NEPA rather than responsibly respond to these issues and disclose and incorporate credible pertinent scientific research recommendations.

The Farley FEIS and ROD must be withdrawn and brought into compliance with the mandates of the NEPA and President Obama's scientific integrity directive. See President Barack H. Obama's Executive Order Regarding Scientific Integrity.

35. Natural Quiet as a Resource.

"Natural quiet" has become increasingly scarce on public lands throughout the Western U.S. Its scarcity is a result of many factors, including the increase in both commercial and military air traffic, the wide-ranging use of multi-year mechanized management actions across public wildlands – such as this proposed logging project, and an increase in the use of all-terrain vehicles (OHVs). Given the growing scarcity of natural quiet coupled with the beneficial effects of natural quiet to most wildlife populations and the recreational experience of forest visitors, the Farley Project NEPA documentation failed completely to address issues of natural quiet, disclose this as a resource worth protecting, and modify alternatives or assess how planned logging and associated actions will affect natural quiet throughout the project area during the extensive duration of the Farley project implementation. The FEIS's proposed alternatives failed to address and incorporate an objective of retaining natural quiet (to the extent within the Forest Service's control) in important landscapes and watersheds, or "soundsheds."

National forests across Oregon's eastside are magnificent in natural wonders and beauty. From the tumbled geology of Northeastern Oregon's weathered Blue Mountains, to the volcanic wonderlands of the Cascade's rain-shadow, our forests are home to a wealth of biodiversity. The Farley Project area is not an exception to this natural beauty and serenity. Instead, the greater Farley area is an amazingly complex natural forest, watershed, and topographical-geologic mosaic wonderland. Alive and vibrant with gorgeous wildflowers, birdsongs and canid howls, seasonally cascading streams and falls, incised canyons, weather carved rocks, and varied wildlife; the region's complex ancient forest mosaics are sculpted by fire, climate, moisture, and time. People in the region, from transitory visitors to long-time residents, come to these forest wonderlands to enjoy and experience the serenity and inspiration of untrammeled nature.

In our increasingly mechanized society, public wildlands are among the only remaining places where people can get away from the incessant noise and intrusions of industrial machines. The Farley Project's planned logging brings the widespread intrusion of industrial logging machines, with their far-reaching noise and harmful impacts, into some of the project area's scant remaining natural forestlands; destroying the serenity and natural quiet of the area, while significantly impacting the wildlife, plants, soils, and waterways of the greater project area.

Given the incompatibility of mechanized logging impacts with natural serenity and other critically important natural resources; including ecological integrity, wildlife habitat, and natural recreational qualities on public lands; the alternative action "choices" presented by the agency to the public really comes down to that of either extending intrusive logging ever further into the Umatilla's remaining forest wildlands.

Outside of a few disparate roadless and wilderness areas, there exists scant little forest throughout the District which has not suffered significant cumulative short and long-term harms from widespread sequential logging. The Farley FEIS fails to address the significant irreparable environmental consequences of the District's sequential logging actions to overall scientific recommendations and agency admonitions to proactively protect and restore abundant wildlife, inland native trout and salmonid populations, and natural recreational qualities throughout the District's forests.

The new EIS for the Farley Project must disclose the full extent and cumulative impacts to natural quiet and natural resources and amenities from the sequential spread of logging projects across nearly the entirety of the District's forests. Overall, Farley and other projects must be reduced in size and extent, utilizing scientifically appropriate management actions, to effectively ensure the area's remaining natural resource qualities are protected. Logging and mechanized management actions damage wildlife habitat, water-systems, old growth and roadless areas, and areas relied on by wildlife and people alike for their biodiversity and serenity.

36. Management Indicator Species.

According to NFMA, the Forest Service must provide animal and plant diversity in the national forests. 16 U.S.C. § 1604(g)(3)(B). USFS regulations implementing this requirement direct the Service to manage forests for viable populations of native vertebrate and desired non-native species. 36 C.F.R. § 219.19. The regulations define viable populations as a population that has "the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area." Id.

To ensure that viable populations are maintained, the Forest Service regulations also require that the Service identify management indicator species (MIS) and that "[p]opulation trends of the management indicator species will be monitored and relationships to habitat change determined." 36 C.F.R. § 219.19(a)(6). This monitoring is "essential to verify and, if necessary, modify the forest plan's assumptions about the effects of timber harvesting and other management activities on wildlife…In order to meet the monitoring requirement, planners will need to obtain adequate inventories of wildlife populations and distribution." Charles F. Wilkinson and H. Michael Anderson, Land and Resource Planning in the National Forests, 304 (1987).

The Ninth Circuit has stated that the duty to ensure viable or self-sustaining populations "applies with special force to "sensitive" species." *Inland Empire Public Lands Council v. United States Forest Serv.*, 88 F.3d 754 (9th Cir. 1996) *citing Oregon Natural Resources Council v. Lowe*, 836 F.Supp 727, 733 (D.Or. 1993). NFMA clearly directs the Forest Service to create regulations to "insure research on and (based on continuous monitoring and assessment in the field) evaluation of the effects of each management system to the end that it will not produce substantial and permanent impairment of the productivity of the land." 16 U.S.C. § 1604(g)(3)(C); Sierra Club v. Martin, 168 F.3d 1 (11th Cir. 1999).

In light of this direction, NFMA's regulations require inventorying and monitoring on the National Forests under 36 C.F.R. §§ 219.12(d) and (k) as well as 36 C.F.R. §§ 219.19(a)(6), 219.26, and 219.19(a)(2). The regulations state "each Forest Supervisor shall obtain and keep current inventory data appropriate for planning and managing the resources under his or her administrative jurisdiction." Id. § 219.12(d). The regulations further require that "at intervals established in the plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied." Id. § 219.12(k). To ensure biological diversity, the regulations specifically require that "[i]nventories shall include quantitative data making possible the evaluation of diversity in terms of its prior and present condition." Id. § 219.26.

Although NFMA clearly requires the monitoring of MIS populations, the Forest Service has traditionally relied upon the availability of suitable MIS habitat, rather than population surveys, to meet NFMA's viable populations requirement. *Inland Empire Public Lands Council v. United States Forest Serv.*, 88 F.3d 754 (9th Cir. 1996).

Recently, however, the Ninth Circuit has revisited its holding in Inland Empire, and held that if the Forest Service utilizes a "proxy-on-proxy" approach to meeting the agency's NFMA obligations, any habitat models must be grounded in fact and field verified. *Idaho Sporting Congress v. Rittenhouse*, 2002 U.S. App. LEXIS 19108 (9th Cir. 2002). The court also acknowledged that other courts have expressly disavowed the holding in Inland Empire, casting additional doubt on the validity of that case. *See generally, Sierra Club v. Martin*, 168 F.3d 1 (11th Cir. 1999), *Utah Environmental Congress v. Zieroth*, 190 F. Supp. 2d 1265, 1272 (D. Utah 2002) (holding that § 219.19 unambiguously requires collection of population data), *Forest Guardians v. U.S. Forest Service*, 180 F. Supp. 2d 1273 (D.N.M. 2001) (same).

Given this developing reinterpretation of the legal requirements attendant to management indicator species, it is clear that the multiple mandates in NFMA and its implementing regulations requiring population monitoring and surveying are not being even minimally met for the Farley project. An EIS must be conducted for this project that complies with these requirements.

This project will have adverse impacts on several terrestrial and aquatic Management Indicator Species, but the FS lacks monitoring data which would tell them whether the cumulative effects of this project and all other past, present, and future projects might be pushing these indicator species toward some threshold of concern for population viability. USDA policy does not allow the Forest Service to take actions that would cause trends toward listing species under the Endangered Species Act. Relevant policy directs the Forest Service to: "1. Manage 'habitats for all existing native and desired non-native plants, fish, and wildlife species in order to maintain at least viable populations of such species.' 2. Habitat must be provided for the number and distribution reproductive individuals to ensure the continued existence of a species generally throughout its current geographic range." FSM 2620.1 and USDA Department Regulation 9500-4 (August 22, 1983. Forest Service objectives are to "provide a sound base of information to support management decision-making affecting wildlife and fish, including endangered, threatened, and sensitive animal and plant species, and their habitats." FSM 2620.2. Forest Service policy is to "use management indicators to address . . . species habitat through all planning levels." FSM 2620.3. The USDA also requires that the Forest Service "avoid actions which may cause a species to become threatened or endangered." DR 9500-4(3)(d).

The Forest Service manages Management Indicator Species as surrogates for habitats that were likely to be limiting in the future (in short supply either in total acreage or in distribution). There is an inherent assumption that MIS are "vulnerable" or represent a class of species that are vulnerable due to current or future habitat limitations. Id. The impacts of management activities on these vulnerable species is likely to be significant in a NEPA context, especially in the absence of clear monitoring information indicating that these populations are health and/or have an increasing trend.

The Forest Service has a choice to either monitor actual populations of Management Indicator Species, OR thy must develop and rigorously validate habitat

models that allow the Forest Service to use habitat as a proxy for populations of these species. We object to the use of proxy-on-proxy approach to wildlife management where the agency uses crude and unverified habitat modeling rather than actual population surveys as a means to ensure the viability of Management Indicator Species ("MIS"). We are not aware of any forest in the Pacific Northwest region that is using a credible and validated habitat model for MIS. If the Forest Service is not monitoring MIS populations directly, please explain in detail the model the Forest Service is using to correlate populations and habitat.

MIS are chosen to represent a suite of other species, but then MIS populations are not even monitored as required by NFMA and the LRMP. NFMA and its implementing regulations require the forest service to manage forests for viable populations of native vertebrate and desired non-native species. Diversity is assessed by identifying MIS, monitoring MIS, gathering inventory data on MIS, and analyzing the impacts of logging (and other management activities) on MIS, because MIS are an indicator of the overall diversity of the forest. 36 CFR § 219.19 et seq. NFMA regulation 219.19 requires that, "fish and wildlife habitat shall be managed to maintain viable population of existing native and desired non-native vertebrate species in the planning area." Further, the Forest Service Manual states the agency must manage "habitats for all existing native and desired nonnative plants, fish, and wildlife species in order to maintain at least viable populations of such species." FSM at 2670.12. In order to maintain viable populations of wildlife, "habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area." 36 CFR § 219.19.

NFMA, its implementing regulations, and subsequent case law require the Forest Service to know what the viable populations of MIS located in the project area are before management prescriptions are applied. However, the NEPA document and the underlying specialist reports never explain what the population levels are for the MIS. This is despite the fact MIS habitat will be negatively affected by this project.

As noted above, the 9th Circuit also does not approve of the "proxy on proxy" approach favored by the Forest Service where indicator species are chosen to represent a suite of other species but then the indicator species populations are not even monitored—instead the agency monitors habitat levels that may or may not reflect populations levels. The Forest Service must refrain from destroying habitat until they have completed population monitoring and documented viable populations of native species. *See Idaho Sporting Congress* and *Alliance for the Wild Rockies v. Rittenhouse*.

The 10th Circuit just recently affirmed the Forest Service's duty to quantitatively measure changes in MIS populations and not just habitat trends. *UEC v. Bosworth*, 10th Circ. June 23, 2004 (http://www.kscourts.org/ca10/cases/2004/06/03-4080.htm):

> "In keeping with the reasoning of the Eleventh Circuit and the district courts of this circuit, we conclude that § 219.19 requires the Forest Service to use actual, quantitative population data to effectuate its MIS monitoring

obligations. Section 219.19 mandates that as part of forest planning, "[f]ish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species." Further, forest management "[p]lanning alternatives shall be stated and evaluated in terms of both amount and quality of habitat and of animal population trends of the management indicator species," § 219.19(a)(2); similarly, "[p]opulation trends of the management indicator species will be monitored and relationships to habitat changes determined," § 219.19(a)(6). Plainly the regulations require that the Forest Service monitor population trends of the MIS in order to evaluate the effects of forest management activities on the MIS and the viability of desired fish and wildlife populations in the forest more generally."

A related case, *UEC II*, elaborated on the MIS requirements:

"UEC I makes clear that "the regulations anticipate application of § 219.19 to project level as well as plan level management actions." 372 F.3d at 1225. As we noted in UEC I, this approach is consistent with other circuits. See Sierra Club v. Martin, 168 F.3d 1, 6 (11th Cir. 1999) (recognizing "that the regulations refer to the formulation of Forest Plans rather than to specific projects proposed under already enacted Forest Plan" but that "the planning process does not end with the Forest Service's approval" and "continue[s] throughout the Plan's existence"); Inland Empire Pub. Lands Council, 88 F.3d at 760 n.6 ("Because any district contained within the boundaries of a forest having a plan would be an 'area . . . covered by a . . . forest plan,' it would [] also be a planning area governed by Regulation 219.19.") (quoting 36 C.F.R. § 219.3). Thus, the Forest Service's obligations under § 219.19 apply to the Project.

Second, we decided in UEC I that the Forest Service must use "actual, quantitative population data" to meet MIS monitoring obligations under § 219.19. 372 F.3d at 1226. "[T]o effectuate its MIS monitoring duties under the language of its regulations, the Forest Service must gather quantitative data on actual MIS populations that allows it to estimate the effects of any forest management activities on the animal population trends, and determine the relationship between management activities and population trend changes." Id. at 1227; see also Martin, 168 F.3d at 6 (examining § 219.19(a)(6) and concluding that "[i]t is implicit that population data must be collected before it can be monitored and its relationship determined")....

Under a plain reading of § 219.19 and UEC I, we conclude that the Forest Service must select an MIS with some evidence that it is "present in the [project] area." The Forest Service must then collect "actual, quantitative population data," id. at 1226, to monitor population trends and to determine relationships to habitat changes. See 36 C.F.R. § 219.19(a)(6). It must also confirm, with "good faith efforts," the presence of the selected MIS within a

project area. UEC I, 372 F.3d at 1230. If no MIS representative is "present in the [project] area," the Forest Service must show good-faith efforts to confirm and explain the absence of selected MIS. It may be that the Forest Service selected an improper guild, or actions previously taken may have had a significant deleterious effect on the chosen MIS. "[W]here impossible, the Forest Service is not required by the applicable statutes and regulations to collect population data." Id. at 1229.

The Forest Service must select within each guild an appropriate MIS that is present in the project area. Selecting only one or two (or a few) acceptable MIS actually present in a project area cannot satisfy the overall monitoring obligations of § 219.19. See Martin, 168 F.3d at 7 (concluding that the Forest Service violated §§ 219.19 and 219.26 because it "ha[d] no population data for half of the MIS in the Forest and thus [could not] reliably gauge the impact of the timber projects on these species").
UEC v. Bosworth, Tenth Circuit No. 03-4251, Aug 17, 2005."

http://www.kscourts.org/ca10/cases/2005/08/03-4251.htm Determining effects on species viability requires consideration of cumulative effects on species populations, including identification of risk factors, species limiting factors, current threats, the relative contribution of private lands and federal lands to species conservation, monitoring results that elucidate the effectiveness of proposed management actions, and disclosure and response to diverse views, adverse opinions, and inconsistent data.

The NEPA analysis must explain the short-comings of the habitat monitoring approach and the risks of relying on habitat monitoring to fulfill its wildlife conservation mandates. Habitat monitoring alone has limited usefulness in predicting wildlife populations for several reasons:

- Scientific knowledge of wildlife-habitat relationships is poor for most species.
- Wildlife species may be affected by properties of the larger landscape, outside the area being measured.
- The habitat variables measured may be chosen for logistical reasons rather than because they are the best indicators of ecological conditions for targeted species. For instance, many woodpecker populations are known to be strongly influenced by the availability of nest cavities, yet nest cavities are not likely to be assessed in a general habitat monitoring scheme.
- The disturbance history (e.g. fire, timber harvest) of an area may influence population size, especially where wildlife species are not mobile and/or where populations are fragmented.
- Current disturbances, such as recreational use, may not affect the physical features of an area but can limit or exclude occupancy by species sensitive to human presence.
- The wildlife species of concern may be influenced by population size of other prey, predator, mutualistic, or competitor wildlife species.

- Population-limiting processes may occur elsewhere for migratory or seasonally mobile species.
- Intrinsic factors, such as disease or parasites, may cause declines in wildlife species that are not predicted by habitat. The general amphibian decline of the past several decades is a good example in which population changes would have been poorly predicted by habitat monitoring alone.

For the many reasons listed in the bullets above, a more informed understanding requires the Forest Service to effectively relate population data to habitat data. Where habitat and population data are being collected to refine our understanding of their relationship, several factors must be considered:

- Effects of external influences on populations, such as those mentioned above, are likely to introduce variability into the habitat/population relationship.
- Collection of habitat data must be consistent with the spatial scale at which species respond to habitat.
- Different levels of habitat data specificity may be needed for collection with different population measures:
  > Predictions of presence/absence for wildlife can be based on broad and correlative habitat variables;
  > Predictions of population change should be based on variables closely tied to factors inducing population change; and
  > Predictions for survival and reproduction should be based on habitat attributes thought to directly influence survival and reproduction, e.g., food availability.

See Holthausen, Richard; Czaplewski, Raymond L.; DeLorenzo, Don; Hayward, Greg; Kessler, Winifred B.; Manley, Pat; McKelvey, Kevin S.; Powell, Douglas S.; Ruggiero, Leonard F.; Schwartz, Michael K.; Van Horne, Bea; Vojta, Christina D. 2005. Strategies for monitoring terrestrial animals and habitats. Gen. Tech. Rep. RMRS-GTR-161. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 34 p. available at http://www.fs.fed.us/rm/pubs/rmrs_gtr161.pdf

37. Pileated Woodpecker, White-headed woodpecker, Pygmy Nuthatch, Lewis' Woodpecker, and other cavity excavators.

The Appellants have a strong interest in ensuring that the planning area supports viable populations of White-headed, Pileated, Lewis' and other woodpeckers and cavity excavators. The EIS fails to indicate substantive ongoing surveys, or comprehensive science, upon which it could reasonably base claims that the planning area is meeting 100% of the potential population for Pileated and other cavity excavators, as required by the amended Umatilla LRMP. The failure to survey and monitor for these species and substantiate compliance with the amended Forest Plan violates the NEPA, and the failure to meet forest plan standards violates NFMA. 16 U.S.C § 1604(i); 36 C.F.R. § 219.10(e).

It is well known that logging significant areas of interior old growth and mature forest adversely affects Pileated, White-headed and numerous other woodpeckers and cavity excavators. Given the fact that a great deal of timber harvest has taken place throughout the district and within this subwatershed that has had adverse impacts upon the availability of these species habitat, and that habitat elements either do not exist or are largely marginal quality at best, it is entirely feasible that these birds are in decline. Further, removing even more of this habitat through commercial logging will have a significant detrimental impact on the project area's cavity excavator species. The FEIS fails to adequately address or fully disclose the project's likely adverse impacts to cavity excavator species. As noted previously, when wildlife and indicator species populations evidence downward trends, the agency must act in order to stop such declines. 36 C.F.R. § 219.19. The planned commercial logging in the Farley area's over-logged and recovering forests will further exacerbate habitat availability and population trend problems for these and other forest-dependent wildlife species.

Snag retention formula utilized by the agency fail to account for the canopy closure or adjacent snag density requirements needed to maintain even minimum habitat viability for primary cavity excavators as well as known cavity nesters which utilize LOS and mature green forest mosaic habitats. The FEIS fails to address and disclose the full habitat requirements of cavity excavator species dependent upon the project area. Such planning and disclosures are necessary to meet the requirements of both the NEPA and the NFMA as well.

The action alternatives proposed violate both NEPA--for failing to disclose the full range of habitat needs of these species and accurately evaluating the project's likely impacts, and NFMA—for proposing logging actions that would further compound the already adverse cumulative loss of habitat and consequent population declines of forest-canopy-dependent species. A new EIS must be prepared which addresses these issues, and which proposes a range of restoration alternatives that would help recover these species habitat and long-term viability.

New information on Pileated Woodpeckers and other cavity excavators indicates Standards & Guidelines are Inadequate: Pileated woodpeckers and cavity excavators play a unique role in the forest ecosystem:

They excavate cavities in trees that are later used by numerous other species not just for nesting, but also for roosting and foraging. Benefited species include numerous avian species and their prey.

a. Their excavations accelerate wood decomposition, nutrient cycling, and fungi dispersal. Kerry L. Farris, Martin J. Huss And Steve Zack. The Role of Foraging Woodpeckers In The Decomposition Of Ponderosa Pine Snags. The Condor 106:50–59. The Cooper Ornithological Society 2004. http://www.sabp.net/woodpeckers&spores.pdf

b. The pileated woodpecker's ability to excavate large cavities in relatively sound trees that are in the early stages of heart wood decay, means that the resulting cavity trees may provide uniquely long-lasting habitat.

c. The combined foraging activities of pileated woodpeckers and all the species they assist tend to mediate insect outbreaks.

The NEPA analysis failed to consider significant new information on pileated and other woodpeckers including: pileated woodpeckers need more and larger roosting trees than nesting trees. They may use only one nesting tree in a year, but they may use 7 or more roosting trees. These and other cavity excavator species also depend upon forest canopy closure, mature as well as LOS forest stands, select for nest trees beginning at 15" dbh and above, and need a significant expanse of contiguous forest habitat. Determining pileated and other woodpeckers population potential based on nesting sites alone will not provide adequate habitat for viable populations of this species. This new information is not recognized in current management requirements at the plan or project level. The EIS must address this new scientific information. See Science Findings Issue 57 (October 2003) Coming home to roost: the pileated woodpecker as ecosystem engineer, by Keith Aubry, and Catherine Raley

38. Downed Wood, Forest Ecology and Viable Habitat.

Dead wood is an essential and under appreciated characteristic of healthy forests, but commercial logging unavoidably reduces current and future dead wood habitat because of hazard tree felling and "capturing mortality." The FEIS repeatedly offers assurance that dead wood species will be fine because the project will retain enough snags to comply with the forest plan and/or the eastside screens, but the FEIS fails to disclose that these are hollow assurances based on discredited standards and guidelines and that readily available science runs counter to these claims.

The FEIS discusses dead wood habitat within the framework of the Umatilla LRMP and the eastside screens both of which rely on an outdated and discredited "potential population" method of snag habitat analysis. The FS must prepare a plan amendment to consider a wide range of possible replacements for the potential population method. DecAID is one such method but it has many flaws and the FS cannot rely on it without conducting the NEPA analysis and plan amendment described above.

The snags and logs that die from all natural causes of mortality and remain on site provide very critical temporal links from one stand to the next. Under natural conditions, a forest hands down a large legacy of living and dead material from one stand to another whether it results from individual tree mortality or after an intense disturbance.

The snag retention standards overestimate habitat capability. The traditional snag habitat model used by the agency is based on outdated and discredited hypothesis that vastly overestimated habitat capability for snag-dependent species. The reason being that the previous standards failed to consider the following important factors: 1. The

importance of snag height; 2. Snag fall rates over time; 3. Snag recruitment rates over time; 4. Use of space by each species; 5. The need for roosting structures as well as nesting structures; 6. Numbers and sizes (dbh) of snags used and selected by secondary cavity-nesters often exceed those of primary cavity excavators; 7. The importance of retaining snags in clumps *and* in a dispersed manner to meet various species needs and ecological functions.

Ohmann, McComb, & Zumrawi; SNAG ABUNDANCE FOR PRIMARY CAVITY-NESTING BIRDS ON NONFEDERAL FOREST LANDS IN OREGON AND WASHINGTON; Wildl. Soc. Bull. 22:607-620, 1994
http://www.fs.fed.us/pnw/pubs/journals/ohmann-snagabundance.pdf

Rose, C.L., Marcot, B.G., Mellen, T.K., Ohmann, J.L., Waddell, K.L., Lindely, D.L., and B. Schrieber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management, Chapter 24 in Wildlife-Habitat Relationships in Oregon and Washington (Johnson, D. H. and T. A. O'Neil. OSU Press. 2001) http://www.nwhi.org/nhi/whrow/chapter24cwb.pdf Schulz, Joyce, Terri T., Linda A. A spatial application of a marten habitat model. 1992, Wildl Soc. Bulletin 20:74-83.

The Forest Service has recognized in other contexts that current methods and assumption concerning snag habitat are outdated. The agencies need to prepare a EIS to consider a replacement method for maintaining species and other values associated with dead wood. This is especially critical because adequate dead wood is recognized as an essential feature of healthy forests and the Forest Service has identified numerous "management indicator species" associated with dead wood habitat. The agency's analysis of snag retention and habitat for cavity dependent species is faulty at both a programmatic level and at a project level. The agency must withdraw its FEIS and decision on this project until it reviews all the available new information and amends its management plan standards to provide adequate snags for wildlife and all other ecosystem functions.

VII. Conclusion

The Appellants have raised a number of issues in this appeal. This appeal is and augmented and substantiated by the declarations provided by Richard H. Waring and Jonathan J. Rhodes, and our extensive appeal exhibits. The requirements of national environmental laws, the recent directives of the Obama administration and applicable case law provide strong support for the legal and scientific reasons that Appellants have set forth in support of Appellants' request that the agency withdraw the Farley Project FEIS and ROD, and associated documents. The Forest Service is quite capable of proposing appropriately scaled projects that focus on restoring ecological resilience while also providing a reasonable economic return from resource extraction in certain areas. Appellants urge the Forest Service to explore these possibilities.

Sincerely,

Ralph O. Bloemers, Staff Attorney, Crag Law Center
Submitted by and on behalf of the League of Wilderness Defenders – Blue Mountains Biodiversity Project ("BMBP") and the Oregon Chapter of the Sierra Club.

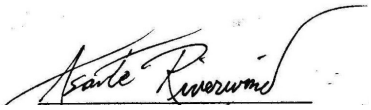
League of Wilderness Defenders Blue Mountains Biodiversity Project ("BMBP"):  Karen Coulter, Director 27803 Williams Lane Fossil, Oregon 97830 Tel. (541) 468-2028 office or 385-9167 voice mail	Oregon Chapter of the Sierra Club (the "Sierra Club")  Asante Riverwind, Eastern Forest Organizer POB 5534 Bend, Oregon 97708 Tel. (541) 322-4065, email asante.riverwind@sierraclub.org

Exhibit A
Recommended Solutions Outlined in Comments

1. Retain all inherently fire resistant mature and old characteristic trees regardless of diameter, condition, location, or height.
2. No logging, road building, and intrusive degrading management actions in undeveloped, unlogged, and/or unroaded areas. Protect ongoing natural ecological processes in uninventoried roadless areas as well as previously unlogged areas by dropping all such areas from logging-thinning units and plans.
3. No logging of any mature and old trees (living, dead, or dying) within aspen and other hardwood areas. As noted in our comments, and in corresponding science research sent as part of our comment exhibits, established mature and old growth conifers are not detrimental competitors with aspen, but rather ecologically symbiotic cohorts. Together these species provide the requisite habitat structure essential for native forest species associated with aspen stands and aspen/conifer forest transition-zone habitat. In the relatively rare locations where limited exceptions to this may be found: where moisture-responding fast growing large young-mature conifers exist, there are ecologically and legally significant reasons for retention of all mature and old characteristic trees. Given the overall habitat needs and declining population trends of native avian species associated with aspen and hardwood-conifer forest habitat, it is ecologically and legally appropriate to either leave these trees or at most turn some of the large mature trees into snags for additional snag-dependent species habitat. Methods employed for this could range from inoculating the selected conifers with pathogenic fungus (preferred for snag habitat), to girdling, felling in place as downed wood habitat, or top removal above 25 to 30 feet high. Current agency plans for commercial logging removal of medium to large diameter conifers in aspen areas (trees >15" dbh), are legally, ecologically, and scientifically insupportable. The FEIS and Record of Decision fail to adequately disclose and address the existent significant scientific controversy and range of applicable credible research concerning forest conifers and aspen stands ecologically symbiotic interface. The FEIS fails to present action alternatives that incorporate credible scientific research addressing the natural interwoven functioning of conifers within and adjacent to hardwood forest stands.
4. As ecologically appropriate, conduct no scientifically insupportable or controversial commercial logging in mixed severity fire forest areas, including north facing slopes, moist spruce and fir-dominant draws and locales, and higher elevation forests where relatively dense structurally complex mixed conifer forests naturally occur.
5. Conduct only low impact scientifically non-controversial restoration in previously logged and roaded forests adjacent to unroaded and unlogged areas, protecting forest continuity and the integrity of forest ecological structure and functioning.

6. Drop all mixed conifer, mixed fire severity forests from commercial logging, including all such areas identified in section V- C's (above) description of the Farley Project units, and noted in Appeal Exhibit B Survey Sheets. Utilize scientifically supported non-controversial non-commercial restoration methods only in these areas and in other mixed conifer mixed fire-severity forest habitat throughout the project area.
7. Road density throughout most of the project area is already in excess of forest plan standards and wildlife thresholds. Drop all plans for the construction of any new roads, including so-called "temporary roads." Ecologically "temporary roads" continue to adversely impact forest habitat quality, continuity, hydrological functioning, and native plants for decades to centuries post-project, and as such are not legitimately "temporary" in impact despite a limited duration of actual mechanical use. Do not build any roads in uninventoried roadless and unroaded as well as unlogged areas. Focus project road actions on reducing the mileage extent and number of roads in the greater project area; including removing roads adjacent to salmonid watersystems and adjacent to or within old growth forest habitat as possible.
8. Retain a minimum variable range of 25-40% of each action unit in untreated patches to provide viable hiding and foraging habitat for species associated with mature and old forest canopy closure, snags, down wood, forest vegetation and shrub cover; including predator species of concern such as goshawk and marten; and their prey species including cavity excavators, cavity users, neotropical migrant and native birds, small mammals, invertebrates, etc. These areas are essential for forest ecological continuity, hydrological functioning, viable undisturbed soil communities, native vegetation, biodiversity, and habitat quality. Retention areas should be selected based upon unit specific conditions and habitat preferences, including forest edge areas, stand areas adjacent to rock outcroppings, watersystems, meadows, around squirrel middens and ant hives, where these help slope stability, and within interior better-quality old and mature forest areas, etc.
9. As pileated and associated species habitat and population trends depend in part upon sufficient snag availability now and in the future, and on forest canopy and cover structure around nest snag areas; and as this is a snag emphasis area: retain more snags/acre and more green tree replacements in order to better mimic natural mortality processes. Until a plan amendment is approved, at a minimum adapt DecAID 80% tolerance levels as an approximation of the east side screens' 100% potential population requirement for snags.
10. Exclude commercial thinning and avoid management disturbance in known and potential Goshawk home territories.
11. Either conduct pre-logging and pre-burning nesting bird surveys for neotropical and native bird species of concern, or employ seasonal prohibitions/restrictions on the implementation of project actions during the vulnerable nesting and fledging periods for avian species of concern.
12. Avoid ecologically indiscriminate aerial ignition of controlled burns, as this unduly harms wildlife, invertebrates, avian species, watersystems, and forest ecological integrity.

13. Ensure project actions do not result in harmful impacts to aquatic species; reduce the number of stream crossings, prohibit applicable project actions during times of excessive soil dryness (airborne dusts/sediments) and during heavy moisture events (heavy rains, peak snowmelt, etc.). Employ effective restrictions and buffers as needed. Do not conduct logging and soil disturbing actions on slopes above salmonid waterways and their tributary systems.
14. Require light on the land low impact equipment for all ground/soil community disturbing actions, keeping these actions to the minimum necessary for ecological recovery.
15. Inventory and protect rare native plant populations and locations.
16. Prevent the spread and/or introduction of exotic invasive plants. Locate, inventory, and ecologically address existent invasive species locations.
17. Provide for Strategic Placement Of Treatments (SPOTS) helping determine unit locations, utilizing existing openings, roads, and geological features to assess and address future fire risks and management objectives. Provide for natural forest stand growth and future natural fire patterns, leaving significant portions of the area untouched by commercial logging.

Exhibit B
Excerpt from Linda Goodman Statement

"Linda Goodman - Regional Forester, Pacific Northwest Region:"

"As we get older, we accumulate things. Sometimes our closets show our life story by the old shirts, slacks or shoes that "hang out" in them. And sometimes, we face the need to downsize our closets and find the usable items that may have benefit to others. We often provide clothes, appliances and other useful items for the greater good of others.

Sometimes, our forests resemble those closets—a bit cluttered and in need of "tidying up." This tidying up not only aids the environment by creating a healthier forest, it also can provide benefits to our local communities. It takes money and time to do this. For a long time, we have known we didn't have the funds to get this work done. That has changed.

The President and Congress have given us an additional 24.7 million dollars to use for our fuels management and timber program. These dollars come with an expectation for us to increase our timber volume for the Northwest Forest Plan and also the east-side Forests. We're going to increase our timber offered program to 675 million board feet this year, and 800 million board feet in fiscal year 2008. That is up from 520 million board feet last year. We're going to do this in both young and mature stands to accelerate growth, reduce hazardous fuels, and improve wildlife habitat. This work will help us fulfill the requirements of the Northwest Forest Plan.

One of the key provisions of the Northwest Forest Plan is to provide economic stability to local communities. Unfortunately, due to a host of factors, the local communities have not seen the stability as envisioned by the Plan. By offering an increased volume of timber, local communities will benefit, both in terms of jobs, revenue, and healthy forests. I realize this work, so late in the fiscal year, won't be easy, and will require a united approach to handle the work. I've appointed Willamette National Forest Supervisor Dallas Emch to spearhead our efforts. Dallas will be working with Forests to make sure we can get the work done in a timely and efficient manner. We know you already had a full schedule of work so we want to look at a full range of options to assist employees in meeting our work. Our goal remains to do this work in a collaborative effort, with counties, partners and citizens all working together for the good of the land and the people "Tidying up" our forests and providing benefits to local communities makes good sense."

Exhibit C
Recommended Solutions.

The project must be revised to incorporate actions and protective provisions recommended by credible scientific research as follows:

1. Avoid commercial logging in mixed fire severity ecosystems, including mixed conifer, moist, and high elevation forests;

2. Remove project aspects that authorize logging, road building, and ecologically degrading disruptive management actions in uplands set aside for fish recovery and the remaining roadless areas;

3. Provide for viable dispersal habitat connectivity and forest structure for species of concern within and adjacent to the Farley Project area;

4. Maintain forest stand structure and ecological integrity specific to current and likely future natural plant association groups (and corresponding aspect, elevation, localized climatic patterns, and varied natural fire cycles);

5. Provide for the habitat needs and both short and long term recovery of wildlife, aquatic, and botanical species of concern throughout the greater project area;

6. Retain fire resistant (generally 12 inches DBH or higher) trees with mature and old characteristics throughout the project's ponderosa pine, mixed conifer, hardwood, and riparian system forests;

7. Utilize strategically-placed limited land area treatments appropriate for low and limited mixed fire severity ponderosa pine forests, allowing interior ponderosa pine, mixed conifer, mixed fire severity forests to undergo natural cycles and ecological processes;

8. Protect soils by requiring low impact light machinery and ecologically protective methodology in all forest areas where machinery is employed;

9. Protect riparian areas by prohibiting machinery use and commercial logging in and upslope of these locations, and by preventing sedimentation and erosion from project actions, including surface and airborne sedimentation;

10. Seasonal restrictions on project implementation protecting avian species during nesting and fledging periods;

11. Seasonal restrictions on project actions protecting terrestrial and botanical species during the vulnerable spring season;

12. Reduce road density to within LRMP standards and wildlife thresholds; eliminate all new road construction including so-called “temporary roads” which are only temporary as to their use, not their effects (this term is scientifically invalid and violates NEPA accuracy requirements);

13. Provide details on protection of the planned management action areas (landings, pile burning sites) from post-project disturbance to recovering soil communities, vegetation, riparian areas, and wildlife, including details on prohibiting livestock grazing in these locations at least one year pre-project implementation and five to ten years post-project completion with the proviso that the protection continue until the affected area evidences native species vegetative, soil community, and hydrological system recovery;

14. Protect the project’s more open forest terrain from ORV intrusions and abuse and other disturbance harms during and post-project implementation;

15. And any other provisions as ecologically appropriate and consistent with the points noted in this appeal.

Exhibit D
Climate Change & Carbon Truths
Management Approaches with Considerable Scientific Support

1. Slowing that rate of deforestation (i.e., the permanent removal of forests) will definitely slow the release of carbon to the atmosphere. Depending upon the period examined, deforestation is estimated to have added 20-30% of the increased carbon dioxide in the atmosphere since the dawn of the industrial revolution. While deforestation for agricultural purposes is generally low in the United States, considerable forest land is being converted to housing and industrial use, which can have the same effect as deforestation, particularly if clearing is extensive.

2. Planting new forests is generally a good practice to increase carbon stores, particularly on lands that once held forest many years ago. Much of our nation's current forest-related carbon removal from the atmosphere is associated with the reestablishment of forests in the eastern US after agricultural abandonment. The best opportunities are on marginal agricultural lands as the impact on food production is reduced. Planting forests on degraded agricultural land can increase the store of carbon both above- and belowground (i.e., soils). Forests can also be reestablished on lands with low stocking of trees after regeneration failures. Planting trees on what have been traditionally grassland systems can lead to reductions in soil carbon stores, in part because trees do not produce as many dead roots as grasses. Care needs to be taken in assuring that these losses belowground do not exceed those gained aboveground.

3. Biomass energy has the potential to offset fossil fuel use and hence reduce carbon release to the atmosphere under certain conditions. However, there are several factors that must be considered before this potential is realized. Biomass energy is not necessarily renewable; it is only renewable when the resource is allowed to fully regenerate. Forests, by their very long-term nature, take years to regenerate their biomass and one can not assume that all forest practices lead to a renewable resource. When using biomass energy, it must be borne in mind that one is substituting energy and not carbon. Because biomass contains less energy per unit carbon than fossil fuels, some fossil fuels are required to produce the same amount of energy, and so removal of one unit of carbon from the forest results in less than one unit of fossil carbon from being unused or stored. It therefore may take several cycles for carbon benefits to accumulate to the point that they offset losses in the forest. This is why the carbon benefits of biomass energy can be delayed if natural forests storing a more carbon are converted to plantations that store less carbon. This suggests that if biomass energy is to be part of a forest strategy, it is best employed with afforestation efforts or in forests that are already young. Although it is usually assumed that fossil fuel use is decreased when biomass energy is used, this is not necessarily true. Given the lifespan of carbon in the atmosphere, the delay in fossil fuel use has to be substantial to be effective. Simply delaying the use a few years does little to reduce the rate of overall carbon emissions. The argument that the increase in fossil fuel related carbon would have been worse without biomass fuels would have merit if the issue was to just slow the increase in these

releases. However, the issue that confronts us is how to decrease the current release rate of fossil fuel carbon.

4. Converting older forests to younger forests rarely stores more carbon. Such action increases the leakiness of the forest bucket (recall major losses discussed above in site preparation, manufacturing losses, and the increased frequency of disturbance). An exception is when a frequent natural disturbance is replaced by a less frequent harvest (which by the way rarely happens). Another is when an inherently very slowly growing natural forest is replaced by a much faster growing plantation. That too is fairly rare. Two of the best ways to store more carbon in forests is to extend the interval between harvests or take less per harvest. Basically both actions make the forest bucket less leaky. Depending on the length of the rotation or the amount of harvest, one can either enhance or reduce the store in forest products. While longer rotations can lower the average amount that is harvested, the material that is harvested tends to be more suitable for long-term use and hence may store more as wood products FOR LONGER.

5. It is possible to increase forest system carbon stores by increasing the growth rate of trees. Depending on the forest, this can be achieved by using superior genetic stock, planting faster growing species, fertilization, irrigation, or speeding the rate of tree regeneration. In most cases the increases in tree growth do not offset the losses from converting older natural forests, and in all cases it may take several harvest intervals before gains are fully realized in wood products stores. Usually the goal of increasing the growth rate of trees is to shorten the interval between harvests. If this practice is followed, then the gains of carbon in the forest itself will be minimal. On the other hand it may result in increased wood products stores, but that depends on the types of products produced. It should also be noted that thinning of forests does not increase the rate carbon is added to forests. It does allow the remaining trees to grow faster and become larger faster, but one must remember that it does this for fewer trees. The claim that thinning increases forest production is really based on the amount harvested, not the amount of carbon entering the forest: these are two completely different things.

6. Reducing fuels in forests have few benefits from a carbon storage standpoint. Recently it has been proposed that reducing fuels in forests would reduce fire severity to the point that more carbon would be stored in forests than allowing them to burn untreated. This practice can have benefits for ecosystem restoration in some forest types (for example, Ponderosa pine), but there appear to be few benefits from a carbon storage perspective. There are many reasons for this result. First, to reduce fuels one needs to reduce carbon stores, so there would have to be major changes in fire severity and size to offset these losses. Second, the difference in the effects of severity on carbon stores is less dramatic than generally imagined. As indicated above, a very light fire might results in forest losses on the order of 5% of total carbon in a forest, whereas for an extremely severe fire these losses might be on the order of 15%. Third, one can not anticipate where fires will occur, so a large proportion of the forest area needs to be treated. In contrast, a small proportion of the forest area may burn in the next few decades, which results in more losses from the treatment than the fires (bear in mind the total effect depends on both the area involved and the average loss per area). The most

likely case where removal of fuels will result in a long-term carbon benefit would be if, without fuel treatment, the fire severity increases to the point that tree regeneration is greatly delayed. However, this regeneration delay has to be substantial to have much of an effect. In other words, it is very rare for the forest to be destroyed by fire. Fire is rarely catastrophic from an ecological standpoint. Rather, fire is most often beneficial from this standpoint.

7. Forest products do store carbon; whether they actually increase the forest system carbon stores is a more complicated issue. Given that the basic material of forest products, wood, is approximately 50% carbon, harvesting wood and placing it into forest products can definitely store carbon. However, this gain is at the expense of storing carbon in the forest, and it is completely possible there will be no net gain in the total forest system carbon stores. Harvest of wood removes carbon from the forest which means the parts of the forest that depended on that carbon will decrease in stores. Manufacturing of wood into products results in a loss of carbon as does the use and disposal of wood products. Overall, the effect of harvesting carbon is to make the overall forest system leakier. If wood products are to be used to store carbon, then the efficiency of converting wood into long-lived products needs to be increased, and the life-span of these products needs to be lengthened considerably (see above). There have been proposals to harvest wood from forests and store it in a location where it can not decompose by burial on land or sinking it into oceans or lakes. I suppose this would be the "ultimate" wood product in terms of carbon storage. Assuring that there is no decomposition may prove challenging: wood is decomposed quite quickly in oceans, for example, organisms such as shipworms readily eat wood as any naval historian can attest. Wood is not the most concentrated form of carbon and the sheer volume to be stored would likely dwarf those of current landfills and interfere with other land-uses.

Also while the scientific truths may not prove to be particularly politically popular with the timber industry the reality is that the harvest of wood causes other parts of the forest to temporally lose carbon which would introduce time lags into the gains offered by this scheme.

8. Substitution of wood for more energy intensive materials has the potential to decrease fossil fuel carbon releases, but how much of this potential will be realized is difficult to quantify. It has been proposed that substitution of wood for more energy intensive materials will reduce the rate that fossil fuel carbon is released into the atmosphere. While wood is generally less energy intensive than many alternative materials, the difference between materials has been decreasing and not all the energy for these is supplied via fossil fuels. Currently, steel and concrete utilize three times the energy of wood. However, most buildings are mixtures of wood and other materials, so the energy savings of a building primarily constructed of wood is 30% relative to those primarily made of other materials. As noted above, harvest results in the release of carbon from the forest and while not fossil fuel-related, these losses need to be deducted from any gains. Many homes and small commercial building already utilize wood to a high degree. It is therefore not clear how large the substitution effect can become in the US.

Finally, although it has been stated by some that the substitution related carbon offset never decreases and accrues each harvest.

However, there are reasons to suspect this claim. This would only be true if wooden buildings lasted forever or the supply of buildings increased without limit. It is far more likely that buildings will have a finite life-span and need to be replaced, which also means wooden buildings can not increase without limits. Since that is true, then in time harvests are maintaining the store in buildings and there is no net gain in this form of carbon offset. So depending on how much carbon is actually offset, this might be part of a bridging strategy.

Exhibit E
Scientific Information Relevant to Dead Tree (Snag) Retention Requirements

1. Franklin, J.F., Lindenmayer, D., MacMahon, J.A., McKee, A., Magnuson, J., Perry, D.A., Waide, R., and Foster, D. 2000. Threads of Continuity. Conservation Biology in Practice. [Malden, MA] Blackwell Science, Inc. 1(1) pp9-16.

2. William F. Laudenslayer, Jr., Patrick J. Shea, Bradley E. Valentine, C. Phillip Weatherspoon, and Thomas E. Lisle Technical Coordinators. Proceedings of the Symposium on the Ecology and Management of Dead Wood in Western Forests. PSW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/

3. Lofroth, Eric. 1998. The dead wood cycle. In: Conservation biology principles for forested landscapes. Edited by J. Voller and S. Harrison. UBC Press, Vancouver, B.C. pp. 185-214. 243 p. http://www.for.gov.bc.ca/hre/deadwood/DTrol.htm

4. Rose, C.L., Marcot, B.G., Mellen, T.K., Ohmann, J.L., Waddell, K.L., Lindely, D.L., and B. Schrieber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management, Chapter 24 in Wildlife-Habitat Relationships in Oregon and Washington (Johnson, D. H. and T. A. O'Neil. OSU Press. 2001) http://www.nwhi.org/nhi/whrow/chapter24cwb.pdf

5. Stevens, Victoria. 1997. The ecological role of coarse woody debris: an overview of the ecological importance of CWD in B.C. forests. Res. Br., B.C. Min. For., Victoria, B.C. Work. Pap. 30/1997.
http://www.for.gov.bc.ca/hfd/pubs/docs/Wp/Wp30.pdf

Nearly a third of all forest creatures depend on standing dead or fallen trees for their survival. Fallen trees and dead wood provide shelter, nest sites, and feeding areas for over 1200 species of birds, mammals, amphibians, and reptiles; over 60% of which feed on insects. These insect-eating species act as natural biological regulators to dampen the effects of insect outbreaks in forested lands, thereby performing an important ecosystem function. Fish benefit from trees that have fallen into stream channels.

Felling and removal of large trees, whether they are alive or dead, removes large material that is normally handed down from one stand to the next. The loss of this material has serious adverse consequences for wildlife, hydrology, soil, etc. These legacies are often described as “lifeboats” that allow species to persist in post-disturbance forests and/or return more rapidly to post-disturbance forests. Given cumulative loss of habitat and ecological functions over the last century, how many lifeboats can we take off the ship when threatened and endangered species and sensitive species are at stake? The NEPA analysis must account for all the values provided by snags and down wood and the effect of removing these legacy structures.

Mechanical treatments unavoidably reduce snag habit, if for no other reason than the habitual removal of snags for safety reasons. In the Windjammer FEIS, the Siuslaw

NF noted that at least six times more coarse wood carries over from old-growth forests after wildfire compared to timber harvest, and the CWD left after logging is smaller and decays faster (citing Spies & Cline 1988).

Even when snag removal is not an intentional design feature of a project, hazard tree felling normally occurs in all treatment areas, plus a safety buffer around all treatment areas, plus a safety corridor along roads, and other work areas. This is a large part of why Korol et al (2002) found that large snag habitat is below historic range of variability, and in the future would attain historic levels only in roadless and wilderness areas. Given the current extent of the road network and the historic extent of logging, the cumulative effects analysis must recognize the inherent conflict between "forest management" (past, present and future) and snags and all their values.

Bull et al. states that the current direction for providing wildlife habitat on public forest lands does not reflect the new information that is available which suggests that to fully meet the needs of wildlife, additional snags and habitat are required for foraging, denning, nesting, and roosting (1997). Johnson and O'Neil (2001) and Rose et al. (2001) also state that several major lessons have been learned in the period 1979 to 1999 that have tested critical assumptions of earlier management advisory models (2001), including some of the assumptions used to develop the current recommendations in the LRMP Standards and Guidelines, as amended by the Regional Forester's Amendment #2. Some assumptions include:

1. The calculation of numbers of snags required by woodpeckers based on assessing their "biological (population) potential" is a flawed technique (Johnson and O'Neil 2001).
2. Empirical studies are suggesting that snag numbers in areas used and selected by some wildlife species are far higher that those calculated by this technique (Johnson and O'Neil 2001).

3. The numbers and sizes (dbh) of snags used and selected by secondary cavity nesters often exceed those of primary excavators (Johnson and O'Neil 2001). This suggests the current direction of managing for 100 percent population potential levels of primary excavators may not represent the most meaningful measure of managing for cavity-nesters and that these snag levels, under certain conditions, may not be adequate for some species.

Lessons Learned During the Last Fifteen Years: Several major lessons have been learned in the period 1979-1999 that have tested critical assumptions of these earlier management advisory models:

- Calculations of numbers of snags required by woodpeckers based on assessing their biological potential. (that is, summing numbers of snags used per pair, accounting for unused snags, and extrapolating snag numbers based on population density) is a flawed technique. Empirical studies are suggesting that snag numbers in

areas used and selected by some wildlife species are far higher than those calculated by this technique.

- Setting a goal of 40% of habitat capability for primary excavators, mainly woodpeckers, is likely to be insufficient for maintaining viable populations.

- Numbers and sizes (dbh) of snags used and selected by secondary cavity-nesters often exceed those of primary cavity excavators.

- Clumping of snags and down wood may be a natural pattern, and clumps may be selected by some species, so that providing only even distributions may be insufficient to meet all species needs.

- Other forms of decaying wood, including hollow trees, natural tree cavities, peeling bark, and dead parts of live trees, as well as fungi and mistletoe associated with wood decay, all provide resources for wildlife, and should be considered along with snags and down wood in management guidelines.

- The ecological roles played by wildlife associated with decaying wood extend well beyond those structures per se, and can be significant factors influencing community diversity and ecosystem processes.

Rose, C.L., Marcot, B.G., Mellen, T.K., Ohmann, J.L., Waddell, K.L., Lindely, D.L., and B. Schrieber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management, Chapter 24 in Wildlife-Habitat Relationships in Oregon and Washington (Johnson, D. H. and T. A. O'Neil. OSU Press. 2001)

The bottom line is that current management at both the plan and project level does not reflect all this new information about the value of abundant snags and down wood. The agency must avoid any reduction of existing or future large snags and logs (including as part of this project) until the applicable management plans are rewritten to update the snag retention standards. See:

PNW Research Station, "Dead and Dying Trees: Essential for Life in the Forest," Science Findings, Nov. 1999 (http://www.fs.fed.us/pnw/sciencef/scifi20.pdf) ("Management implications: Current direction for providing wildlife habitat on public forest lands does not reflect findings from research since 1979; more snags and dead wood structures are required for foraging, denning, nesting, and roosting than previously thought.")

Jennifer M. Weikel and John P. Hayes, HABITAT USE BY SNAG-ASSOCIATED SPECIES: A BIBLIOGRAPHY FOR SPECIES OCCURRING IN OREGON AND WASHINGTON, Research Contribution 33 April 2001, http://www.fsl.orst.edu/cfer/snags/bibliography.pdf;

DecAID, the Decayed Wood Advisor for Managing Snags, Partially Dead Trees, and Down Wood for Biodiversity in Forests of Washington and Oregon, http://wwwnotes.fs.fed.us:81/pnw/DecAID/DecAID.nsf

There is evidence that retaining more than the minimum number of snags has significant benefits for cavity dependent species. Comparing two sites in Northern California, Blacks Mountain Experimental Forest (BMEF) with little past logging and lots of snags, and Goosenest Adaptive Management Area (GAMA) with lots of logging and fewer snags, the author's found "… three times as many snags (6.38/acre vs. 2.04/acre, respectively) … The use of snags by cavity-nesting bird species was dramatically different between the sites. Thirty-one cavity-nesting pairs from 10 species were detected at BMEF, while only one pair each of two species were detected at GAMA…. This fifteenfold difference is much greater than any measure of snags or cavities reported. … We feel that forest managers may well be asking a misleading question. "Snags per acre" requirements implicitly assume an equilibrium condition and reflect only one ecological requirement for a given cavity-nesting species. … [C]onsideration of foraging habitat and other ecological requirements must be part of the "snags per acre" management considerations. This is an important, but somewhat daunting proposition, as potential cavity-nesting species are diverse, and each species likely has very different foraging ecologies, as well as other differences in habitat requirements. … [C]avity nesters at BMEF used larger snags on average … [T]he loss of large trees due to logging in eastside pine and other forests, over the past century has major implications for cavity-nesting birds. … [F]orest managers must have a sense of snag recruitment in relationship to snag fall, and the patterns and processes that underlie them, when addressing wildlife needs. … We view the understanding of these complexities to be of primary importance in forest management for wildlife.") Steve Zack, T. Luke George, and William F. Laudenslayer, Jr. 2002. Are There Snags in the System? Comparing Cavity Use among Nesting Birds in "Snag-rich" and "Snag-poor" Eastside Pine Forests. USDA Forest Service Gen. Tech. Rep. PSW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/017_Zack.pdf

Before relying on DecAID, the agency must prepare a comprehensive NEPA analysis to consider alternative ways of ensuring viability of all species dependent upon snags and dead wood. While it is true that the "potential population" or "habitat capability" method is no longer considered scientifically valid, the agency has not yet considered a full range of alternative methods to replace the habitat capability method mandated in the forest plans.

1. Before using DecAID, the agency must establish a rational link between the tolerance levels in DecAID and the relevant management requirements in the applicable resource management plan. For instance, since the Northwest Forest Plan and the Eastside Screens require maintenance of 100% potential population of at least some cavity-dependent species, the agency must explain why that does not translate into maintaining 100% of the potential tolerance level. If the site is capable of supporting 80% tolerance levels, the agency should not be able to manage for 30-50% tolerance levels and still meet the 100% potential population requirement.

2. Blind reliance on DecAID is inappropriate. DecAID does not pick the management objective. The agency must specify the management objective based on RMP objectives for the land allocation or based on natural "range of variation." Since large snags are outside the natural range of variability across the landscape, the agency must retain all large snags to start moving the landscape toward the natural range of variability, or the agency must carefully justify in the NEPA analysis every large snag it proposes to remove. See Jerome J. Korol, Miles A. Hemstrom, Wendel J. Hann, and Rebecca A. Gravenmier. 2002. Snags and Down Wood in the Interior Columbia Basin Ecosystem Management Project. PNW-GTR-181.

http://www.fs.fed.us/psw/publications/documents/gtr-181/049_Korol.pdf This paper estimates that even if we apply enlightened forest management on federal lands for the next 100 years, we will still reach only 75% of the historic large snag abundance measured across the interior Columbia Basin, and most of the increase in large snags will occur in roadless and wilderness areas.

3. Be sure to use the DecAID tool appropriately. The agency must address the dynamics of snag habitat over time, by ensuring that recommended snag levels are maintained over time given typically high rates of snag fall and low rates of snag recruitment following fire. These dynamics are not accounted for in the DecAID advisor. The agency often misuses the DecAID decision support tool by looking at only a snap-shot in time. The agency relies on DecAID to analyze impacts on snag dependent species, but the agency fails to recognize that

"DecAID is NOT: … a snag and down wood decay simulator or recruitment model [or] a wildlife population simulator or analysis of wildlife population viability. … Because DecAID is not a time-dynamic simulator … it does not account for potential temporal changes in vegetation and other environmental conditions, … DecAID could be consulted to review potential conditions at specific time intervals and for a specific set of conditions, but dynamic changes in forest and landscape conditions would have to be modeled or evaluated outside the confines of the DecAID Advisor."
Marcot, B. G., K. Mellen, J. L. Ohmann, K. L. Waddell, E. A. Willhite, B. B. Hostetler, S. A. Livingston, C. Ogden, and T. Dreisbach. In prep. "DecAID -- work in progress on a decayed wood advisor for Washington and Oregon forests." Research Note PNW-RN-XXX. USDA Forest Service, Pacific Northwest Region, Portland OR. (pre-print)
http://wwwnotes.fs.fed.us:81/pnw/DecAID/DecAID.nsf/HomePageLinks/44C813BC574BDFCC88256B3E006C63DF

To clearly and explicitly address the issue of "snag dynamics" the can start by reading and responding to the snag dynamics white paper on the DecAID website which says "To achieve desired amounts and characteristics of snags and down wood, managers require analytical tools for projecting changes in dead wood over time, and for comparing those changes to management objectives such as providing dead wood for wildlife and ecosystem processes" and includes "key findings" and "management implications" including "The high fall rate (almost half) of recent mortality trees needs to be considered

when planning for future recruitment of snags and down wood. Trees that fall soon after death provide snag habitat only for very short periods of time or not at all, but do contribute down wood habitat. In fact, these trees are a desirable source of down wood as they will often begin as mostly undecayed wood and, if left on the forest floor, will proceed through the entire wood decay cycle with its associated ecological organisms and processes that are beneficial to soil conditions and site productivity."
http://wwwnotes.fs.fed.us:81/pnw/DecAID/DecAID.nsf/HomePageLinks/863EEA66F39752C088256C02007DF2C0?OpenDocument

5. The tolerance levels from DecAID may be too low to support viable populations of wildlife associated with dead wood, because anthropogenic factors that tend to reduce snags (e.g., firewood cutting, hazard tree felling, fire suppression, and salvage logging) may have biased the baseline data that DecAID relies upon to describe "natural" conditions. See Kim Mellen, Bruce G. Marcot, Janet L. Ohmann, Karen L. Waddell, Elizabeth A. Willhite, Bruce B. Hostetler, Susan A. Livingston, and Cay Ogden. DecAID: A Decaying Wood Advisory Model for Oregon and Washington in PNW-GTR-181, citing Harrod, Richy J.; Gaines, William L.; Hartl, William E.; Camp, Ann. 1998. Estimating historical snag density in dry forests east of the Cascade Range. PNW-GTR-428. http://www.fs.fed.us/pnw/pubs/gtr_428.pdf

6. DecAID is still an untested new tool. The agencies must conduct effectiveness monitoring to determine whether the snag and down wood retention recommendations in the DecAID advisor will meet management objectives for wildlife and other resource values.

7. The "unharvested" inventory data used in DecAID may represent but a snapshot in time, and fail to capture the variability of dead wood over time, including the pulses of abundant dead wood that follow disturbances and may prove essential for many wildlife species.

8. DecAID must be used with extreme caution in post-fire landscapes because the data supporting DecAID does not include natural post-fire landscapes. ("The inventory data likely do not represent recent post-fire conditions very well … young stands originating after recent wildfire are not well represented because they are an extremely small proportion of the current landscape … The dead wood summaries cannot be assumed to apply to areas that are not represented in the inventory data." "DecAID caveats" http://wwwnotes.fs.fed.us:81/pnw/DecAID/DecAID.nsf).

9. DecAID relies on a wide range of sources in the literature, some of which recommend much higher levels of snag retention than reflected in the advisor. The agency NEPA analysis should disclose the published literature with higher levels of snag and wood retention and discuss their potential relevance for the project. ("the agency must disclose responsible opposing scientific opinion and indicate its response in the text of the final statement itself. 40 C.F.R. § 1502.9(b)." Center for Biological Diversity v. United States Forest Service, No. 02-16481 (9th Cir., Nov. 18, 2003).)

10. DecAID tolerance levels need careful explanation. These tolerance levels are very difficult to put in terms that are understandable by the general public, but if the Forest Service is going to use this tool they must make it understandable. The NEPA analysis should provide cumulative species curves for each habitat type and each forest structural stage and should explain the studies and publications that support the data points on the curves. What kind of habitat were the studies located in? What was the management history of the site? Was the study investigated nesting/denning, or roosting and foraging too?

11. DecAID does not account for the unique habitat features associated with some types of snags. DecAID primarily just counts snags and assumes that all snags of approximately the same size have equal habitat value, but this fails to account for the fact that certain types of snags and dead wood features are unique, such as: hardwood snags, hollow trees and logs, different decay classes, etc. The NEPA analysis must account for these features and the agency should disproportionately retain dead wood likely to serve these unique habitat functions.

12. DecAID authors caution that "it is imperative, however, to not average snag and down wood densities and sizes across too broad an area, such as across entire watersheds, leaving large areas within watersheds with snags or down wood elements that are too scarce or too small" Kim Mellen, Bruce G. Marcot, Janet L. Ohmann, Karen L. Waddell, Elizabeth A. Willhite, Bruce B. Hostetler, Susan A. Livingston, and Cay Ogden. DecAID: A Decaying Wood Advisory Model for Oregon and Washington in PNW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/042_MellenDec.pdf While we agree that snags and down wood must not be averaged over wide areas, we also must emphasize that snags and down wood are far below historic levels on non-federal lands, so in order to ensure viable populations of wildlife and avoid trends toward ESA listing, federal lands must be managed to compensate for the lack of down wood on non-federal lands.

13. DecAID appears to be based on the idea that the habitat needs of certain key wildlife species represent the best determinant of how much dead wood to retain, and this may in fact be true, but DecAID should also include cumulative curves for other ecological functions provided by dead wood, including: site productivity, nutrient storage and release, erosion control, sediment storage, water storage, water infiltration and percolation, post-fire micro-site maintenance, biological substrate, thermal mass, etc. How much dead wood is needed for thee functions?

14. DecAID may be best used for program level planning rather than project level planning. See Dallas Emch and Gary Larson, 2006. Review & Analysis of Remainder of Comments on FEIS Supplements for Multiple Timber Sales on Mt. Hood & Willamette National Forests on Remand in ONRCA v. Forest Service CV-03-613-KI (D.Or.). 4-10-06.

Exhibit F
Guidance on Restoring Resiliency and Forest Health

The agency should follow these guiding parameters in combination with the other scientific research, aquatics, wildlife, and ecological information addressed above:

> When conducting restoration management projects take the opportunity to implement critical aspects of watershed restoration, especially reducing the impacts of the road system and livestock grazing and establishing the ecological processes that will allow streams and fire regimes to recover.

> Try to restore ecological processes that can be self-sustaining; don't just restore forest structure which requires continuous expenditure of money and effort to maintain. (See Reed F Noss, Jerry F Franklin, William L Baker, Tania Schoennagel, and Peter B Moyle. 2006. Managing fire-prone forests in the western United States. Front Ecol Environ 2006; 4(9): 481–487. available at http://spot.colorado.edu/~schoenna/images/Nossetal2006Frontiers.pdf

> Don't let logging economics determine restoration priorities. If restoration is misused primarily to log areas that have commercial sized trees and the agency fails to conduct legitimate restoration across the thousands of acres lacking economic return, the USFS will not be accomplishing real restoration which requires carefully and strategically choosing the subset of the landscape that can be treated to provide the greatest gain (both ecological and fire hazard reduction) for the least ecological "cost" in terms of soil, water, wildlife, and weeds. Allowing economics to drive these choices will result in greater ecological impacts and lower ecological gains. The NEPA analysis must honestly disclose what "needs" treatment vs. what is actually being proposed so the public can see what's being sacrificed.

> Use the historic range of variability as a guide, but don't just focus on seral stage. Consider also the historic abundance of ecological attributes like large trees, large snags, roadless areas, etc. all of which have been severely reduced from historic norms.

> New evidence indicates that far more of the "dry" forests, rather than being typified low severity fire regimes, were in fact dominated by mixed severity fire regimes (including significant areas of stand replacing fire), so mixed severity fire is an important part of the historic range of variability that should be restored. The goal should not be a uniform low severity fire regime, but rather a wide natural mix of tree densities in patches of varying sizes. This objective can often be met by allowing natural fire regimes to operate, or by protecting significant areas from undue management impacts when planning restoration and resilience recovery projects.

> Prioritize restoration in ecologically appropriate dry forest types at low elevation and on south slopes. Limited defensible space actions in wildland urban interface areas immediately around residences and structures may also be a priority, but

the WUI must not be defined too broadly. Fire hazard can be effectively reduced by treating the area immediately adjacent to structures and these home ignition zones are usually not on federal lands. Management actions in forests with naturally mixed-severity fire regimes should be carefully scrutinized to ensure those areas are really outside of the HRV and actions other than protective provisions are really needed. Management actions in mixed severity fire regimes should protect and retain stand density, complexity, structure, patchy character, and high levels of snags and large dead wood.

> Prioritize actions in management altered dense young stands that are most "plastic" and amenable to restoration. Another priority is to carefully plan and narrowly target actions to protect specific groves of fire-resistant, old-growth trees that are threatened by ingrowth of small fuels, but don't focus or misuse rigid density reduction targets. Leave all medium and large trees that show mature and old-growth characteristics.

> Thin from below, retaining the largest trees, or use "free thinning" with a low diameter cap of 8" to 12" or 14" dbh, so that sufficient trees of all size classes are retained. Retain all large and medium sized trees so they can recruit into the larger classes of trees and snags. Regardless of size, retain all trees with mature and old-growth characteristics such as thick bark, yellowing bark, flat top, asymmetric crown, broken top, forked top, etc. These trees have important habitat value and human values regardless whether they are 21" dbh or smaller. Allow natural processes of succession and mortality turn medium and large trees into ecologically valuable snags and down wood.

> Diameter limits are a useful management tool for restoration. The public appreciates low diameter limits as these provide assurance that project actions will not devastate a forest area. It is preferable to use lower diameter limits for fire resistant species, higher limits for encroaching fast growing young trees that would not normally be found within a given area's HRV stand composition (however, this must be verified with accurate site-specific research. The exceptional circumstances in which diameter caps allegedly don't work, are more rare than the circumstances in which alternative techniques will lead to unintended consequences, including lack of public trust.

> Recognize that thinning affects fire hazard in complex ways, including making fire hazard worse because thinning: creates slash; moves fine fuels from the canopy to the ground (increasing their availability for combustion); thinning increases ignition risk; thinning makes the forest hotter, dryer, and windier; and makes site resources available that could stimulate the growth of future surface and ladder fuels. Fuel reduction must find the "sweet spot," by removing enough of the small surface and ladder fuels while retaining enough of the medium and large trees to maintain canopy cover for purposes of microclimate, habitat, hydrology, suppression of ingrowth, etc.

> There is growing evidence that in order to be effective, mechanical treatments must be kept limited and be followed by low intensity fire. But the effect, seasonal timing, and extent of such fires must be carefully considered.

> In limited areas where their exits ecological scientific support for small diameter thinning, don't thin to uniform spacing. Use variable density thinning techniques to establish a variety of microhabitats, break up fuel continuity, create discontinuities to disrupt the spread of other contagious disturbances such as disease, bugs, weeds, fire, etc. Retain patchy clumps of trees which is the natural pattern for many species.

> Use naturally based creativity to establish diversity and complexity both within and between stands. "Gappy and clumpy" is often use to describe the distribution of trees in dry forests. Use skips and gaps within units to help achieve diversity. Gaps should be small, while skips should be a little larger. Landings should not be employed as these do not make good gaps because they are clearcut, highly compacted and disturbed, more likely subject to repeated disturbance, and directly associated with roads. Gaps should be located away from roads where natural openings already exist. These must not be clearcut but rather should retain existent residual structure in the form of live or dead trees.

> The scale of patches in variable density thinning regimes is important. Ideally variability should be implemented at natural scales, including: the scale of tree fall events; pockets of variably contagious disturbance from insects, disease, and mixed-severity fire; soil-property heterogeneity; topographic discontinuities; the imprint of natural historical events; etc.

> Retain and protect under-represented species of conifer and non-conifer trees and shrubs. Retain patches of dense young stands as wildlife cover and pools for recruitment of future forests.

> Recognize that thinning captures mortality and that plantation stands are already lacking critical values from dead wood due to the unnatural stand history of all logged and planted stands.

> Retain abundant snags and course wood and green trees for future recruitment of snags and wood. Retention should be both distributed and in clumps so that thinning mimics light natural disturbance. Retention of dead wood should generally be proportional to the natural HRV structure of the given forest area. Retain all wildlife trees such as hollows, forked tops, broken tops, leaning trees, large and medium snags, trees with feeding and foraging evidence, trees located near squirrel middens, dens, or nests, etc.

> If using techniques such as small diameter whole tree yarding or yarding with tops attached to control fuels, the agency should top a portion of the trees and leave the greens in the forest in order to retain nutrients on site.

> Avoid impacts to raptor and other avian species of concern nests and enhance habitat for diverse prey species. Train marking crews and cutting crews to look up and avoid cutting trees with nests of any sort and trees with beneficial habitat defects.

> Take proactive steps to avoid the spread of invasive exotic plants. Avoid and minimize soil disturbance. Retain canopy cover and native ground cover to suppress the spread of invasive non-native plants.

> Buffer streams from project actions, Prohibit the use of heavy equipment and the loss of bank trees and trees that shade streams. Provide for sufficient future LWD by retaining extra snags and wood in riparian areas. Recognize that even small diameter thinning captures mortality that is not necessarily compensated by future growth.

> Protect soils by avoiding road construction, prohibiting soil damaging ground-based logging, and avoiding numerous large burn piles. Where roads are considered necessary, ensure that road density levels are well below wildlife thresholds, and the realized restoration and management access benefits far outweigh the adverse impacts of the road. Remove resource damaging and unnecessary roads. Prevent firewood felling of mature and large trees and snags, prevent ORV trespass and damage, and conduct needed restoration well before the next rainy season to avoid stormwater pollution and sedimentation to area watersystems.

> Acknowledge and consider the following potentially significant issues in the NEPA analysis:

1. Removing commercial sized logs, and associated roads and slash disposal, often conflicts with other resource values such as soil, water, invasive plants, wildlife habitat, fire hazard, and carbon storage;

2. Removal of commercial sized logs can make the stand hotter, dryer, and windier, making fire hazard worse instead of better;

3. Commercial logging tends to present significant risks of invasive plant introduction and spread because of soil disturbance and canopy reduction;

4. Removal of commercial logs necessitates road related impacts on soil and water resources. Machine piling and pile burning tend to cause significant adverse impacts on soil and water, especially when combined with road impacts and other logging disturbances.

5. “Capturing mortality” reduces future snag habitat that is already deficient. Increasing vigor via thinning delays recruitment of snag habitat that is already deficient;

6. The unavoidable adverse impacts of logging and roads must be weighed against the rather uncertain claims of fuel reduction. There is actually a very low

probability that moderate intensity fire will affect any given stand during the relatively brief time period that fuel reduction is alleged to be reduced. Fuel reduction has little or no beneficial effect on low severity fires (controlled by favorable weather conditions) or on high severity fires (controlled by unfavorable weather conditions).

7. Forest ecosystem resilience is complex in nature, with many interwoven "feedback" loops. There exists considerable scientific uncertainty and controversy concerning critical factors relevant to decisions about "fuel" reduction, including: (A) uncertain rates of tree mortality and how many young trees need to be retained to ensure proper recruitment of future stands of old trees and large snags; (B) uncertainty about how much the canopy can be reduced without making the stand hotter, dryer, and windier (and exacerbating fire hazard); (C) uncertainty whether logging has any significant beneficial effect on controlling insects and diseases like mistletoe; (D) uncertainty whether thinning actions damage foundational forest soils necessary for resilience more than these benefit long-term stand ecological integrity and longevity; etc.