February 14, 2014

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RE: Scoping Comment Addendum for Crawford Vegetation Project

The Klamath Physiographic Province is recognized as a globally significant bioregion. This region supports a large number of endemic, rare, and sensitive flora and fauna, has the largest strongholds of low elevation temperate forest in the nation, as well a high concentration of wild and scenic rivers. The Klamath Basin is also well known for its past legendary salmon and steelhead runs. Ecological Restoration Implementation Plan (ERIP) Region 5-USFS

Intact forest ecosystems provide the natural capital, including clean air and water, upon which all life and all human economies ultimately depend.
DellaSala 2003

Dear Crawford ID Team,

Please accept these additional Crawford Vegetation Project scoping comments to those previously submitted September, 2011 on the on behalf of the Klamath Forest Alliance, EPIC-Environmental Protection Information Center and the Klamath Siskiyou Wildlands Center (KSW). Please do send hardcopies of subsequent NEPA documents to EPIC and KSW offices.

The project proposes 268 acres of commercial thinning within natural stands, 179 acres of commercial thinning in plantations, 41 acres of non-commercial treatment within meadow/riparian areas, 108 acres of mastication and 1,207 acres of underburning. The project area is located 15 miles southwest of Happy Camp off of the Bear Creek Road (15N19). In addition, the proposed action includes the use of 0.29 miles of "temporary" road on existing roadbeds, and construction of approximately 0.69 miles of new "temporary" roads. No roads will be added to or deleted from the National Forest Transportation System. The estimated number of new landings is 16 (about 10 acres) and 50 existing landings (about 15 acres).

Ecosystem management clearly implies that collaboration and communication among interested parties is essential in promoting a more unified approach to managing landscapes on larger spatial and temporal scales. If this collaborative effort is to be successful in on-the-ground improvements of ecological components, science must not be simply an equal opinion among others, but the basis from which to start from. Skroch 2005 USDA pg. 262

The Crawford Vegetation project is within the Scope of the Western Klamath Restoration Partnership (Partnership). Because this particular area is an astoundingly ecologically vital connectivity corridor between the Marble Mountain and Siskiyou Wilderness Areas (Siskiyou Released Roadless Area (B5701) we ask that you consider the project be "adopted" by the Partnership and that the Klamath National Forest consider alternative funding sources to alleviate the desire of road and landing construction and the removal of large fire resilient wildlife trees.

The Klamath National Forest staff is participating in the Partnership. To allow ecologically devastating impacts in this particular watershed would be disingenuous and directly contrary to the intent and spirit of the Partnership. Because this project is in scoping we ask that you honestly and deeply consider the following concerns.

<u>CLIMATE CHANGE AND THE IMPORTANCE OF LOW ELEVATION NORTH FACING SLOPES</u>

The ability of the Region's forestlands to sequester and store carbon has become a matter of national and international significance. Human additions of greenhouse gases to the atmosphere are altering the climate, and federal land management agencies like the Forest Service are expected to play a major role in U.S. adaptation and mitigation responses to global warming. Mitigation responses revolve around the maintenance and enhancement of carbon sequestration processes on forestlands. ERIP pg. 2

Ensure the retention and sustainability of forests, forest resources, and forest carbon over the long term, even as climates change. ERIP pg. 3

> *The Klamath-Siskyou Ecoregion (KSE) contains globally important biodiversity– only five other temperate forests regions are as diverse or home to as many*

endemic species and ancient lineages (e.g., Caucasus, Southwestern China, Southeastern United States, Coastal Plain/Southern Appalachians, Valdivia rainforests of Chile and Argentina; Olson et al. 2001; Tecklin et al. 2011). The special location (latitude and coastal proximity), rugged terrain, climatic stability, and complexity of soils and microclimates have allowed the region to act as a refuge from past climatic changes for species and natural communities requiring cool and moist conditions (Whittaker 1960, 1961; Stebbins and Major 1965; Wagner 1997; Coleman and Kruckeberg 1999; Sawyer 2007).

One might expect that the KSE will continue to function well as a climate change refugium as human-caused climate change progresses. However, cumulative land use impacts combined with projected climate change could have a profound impact on the ecoregion's species and ecosystems. In the KSE, over a century of land use activities (e.g., logging, mining, livestock grazing, damming of rivers, mining, and human-caused alterations of fire) have resulted in loss or degradation of mesic habitats (DellaSala et al. 1999) that may have previously functioned as refugia over millennia. Impacts include loss of contiguous habitat along intact elevational and other environmental gradients that may facilitate climate-related shifts in natural communities and loss and degradation of most of the mature and old-growth forests (e.g., only about 28% of the historic old-growth forests remain; Strittholt et al. 2006), particularly mesic lowland and mid-elevation habitats (Staus et al. 2002). Increasing prevalence of invasive plants and pathogens facilitated by road building and land use practices poses an additional threat to native species and communities (DellaSala et al. 1999).

The existing protected area system (i.e., National and State Parks, Wilderness Areas, National Monuments, Botanical Areas) is inadequate for ensuring the persistence of most of the ecoregion's vulnerable biodiversity (DellaSala et al. 1999; Noss et al. 1999; Carroll et al. 2010). Existing reserves largely protect higher-elevation communities, while the lower-elevation reserves are limited in their geographic extent, thereby missing many distinct lowland species assemblages and areas that may act as potential microrefugia. We define microrefugia as sites with cool and moist conditions conducive to the persistence of species vulnerable to climate change.

Securing a high level of protection and undertaking ecologically based restoration in degraded areas is important, as well as protection of large, complex landscapes with diverse terrains, soils, microclimates and other environmental gradients. In particular, low and mid-elevation habitats in higher precipitation areas (e.g., along the coast) will provide multiple local opportunities for persistence of vulnerable species.

***In order to maintain pockets of habitat for climate-vulnerable species, conservation attention should be aimed at securing microrefugia that may uniquely provide opportunities for many species to persist and are particularly threatened due to ongoing habitat degradation and rapid warming**. The*

importance of microrefugia for the long-term persistence of species that are sensitive to climate change is increasingly being recognized (Noss 2001; Loarie et al. 2008, 2009; Rull 2009, 2010; Ashcroft 2010; Dobrowski et al. 2010). In temperate regions, terrain positions and habitat types that maintain persistent cool and moist conditions favorable for effective microrefugia are increasingly well defined (e.g., Dobrowski et al. 2010).

Reducing non-climate stressors and securing protection for large, complex landscapes are important long-term actions to alleviate climate change impacts on biodiversity. Equally important is the immediate protection of a network of climate change microrefugia, ***particularly old growth and intact forests on north-facing slopes*** *and in canyon bottoms, lower- and middle-elevations, wetter coastal mountains, and along elevational gradients. Such areas provide local opportunities for vulnerable species to persist within the ecoregion.*

Most of the region's biodiversity, endemic species, and species vulnerable to climate change are invertebrates, non-vascular plants, and fungi that are largely restricted to persistently cool and moist late-successional forests. Opportunities for climate change response for vulnerable taxa will necessarily be local due to a limited capacity of many species to move to new habitat, even over relatively small distances where land use practices create inhospitable condition.

The special location (latitude and coastal proximity), rugged terrain, climatic stability, and complexity of soils and microclimates have allowed the region (Klamath Siskiyou) to act as a refuge from past climatic changes for species and natural communities requiring cool and moist conditions.

Impacts include loss of contiguous habitat along intact elevational and other environmental gradients that may facilitate climate-related shifts in natural communities ***and loss and degradation of most of the mature and old-growth forests (e.g., only about 28% of the historic old-growth forests remain****; Strittholt et al. 2006****), particularly mesic lowland and mid-elevation habitats*** *(Staus et al. 2002****). Increasing prevalence of invasive plants and pathogens facilitated by road building and land use practices poses an additional threat to native species and communities*** *(DellaSala et al. 1999).* Olsen et al. 2012 (emphasis added) Provided

Olsen et al 2012, at page 70, particularly illustrates the Crawford project area as being a priority area for microfugia importance. Please address how canopy removal, road and landing construction and ground based logging will affect microfugia.

An overwhelming body of literature has shown that species richness is generally higher at low and mid-elevations. Srittholt 1999 pg. 13 Provided

The DEIS should incorporate and address the 2012 National Fish, Wildlife and Plants Climate Adoption Draft Strategy. We incorporate the entirety of the document by reference and are providing a copy to the agency. The following are excerpts from the Strategy:

1.3.1 Purpose, Vision, and Guiding Principles
In 2009, the FWS launched a series of Conservation Leadership Forums to bring together leaders in the conservation community to discuss what a Strategy should include and how it should be developed. That effort, and others, produced a purpose, a vision, and guiding principles for developing this first national climate change adaptation strategy.

Purpose: The purpose of the Strategy is to inspire and enable natural resource professionals and other decision makers to take action to conserve the nation's fish, wildlife, plants, and ecosystem functions, as well as the human uses and values these natural systems provide, in a changing climate.

Vision: Ecological systems will sustain healthy, diverse, and abundant populations of fish, wildlife, and plants. Those systems will continue to provide valuable cultural, economic, and environmental benefits in a world impacted by global climate change.

Guiding Principles for the development of this Strategy: An unprecedented commitment to collaboration and communication is required among federal, state, and tribal governments to effectively respond to climate impacts. There must also be active engagement with conservation organizations, industry groups, and private landowners.

In light of these considerations, the development of this Strategy was guided by the following principles:

1. *Build a national framework for cooperative response. Provide a framework for collective action that promotes collaboration across sectors and levels of government so they can effectively respond to climate impacts.*
2. *Foster communication and collaboration across government and non-government entities. Create an environment that supports the development of cooperative approaches to adapting to climate change while respecting jurisdictional authority.*
3. *Engage the public. To ensure success and gain support for adaptation strategies, a high priority must be placed on public outreach, education, and engagement in adaptation planning and natural resource conservation.*
4. *Adopt a landscape/seascape based approach that integrates best-available science and adaptive management. Strategies for natural resource adaptation should employ: ecosystem-based management principles; species-habitat relationships; ecological systems and function; strengthened observation and monitoring systems; model-based projections; vulnerability and risk assessment; and adaptive management.*
5. *Integrate strategies for natural resources adaptation with those of other sectors. Adaptation planning in sectors including agriculture, energy, human health, and transportation may support and advance natural resource conservation in a changing climate.*
6. *Focus actions and investments on natural resources of the United States and its Territories. But also acknowledge the importance of international collaboration*

and information-sharing, particularly across our borders with Canada and Mexico. International cooperation is important to conservation of migratory resources over broad geographic ranges.

7. *Identify critical scientific and management needs. These may include new research, information technology, training to expand technical skills, or new policies, programs, or regulations.*
8. *Identify opportunities to integrate climate adaptation and mitigation efforts. Strategies to increase natural resource resilience while reducing GHG emissions may directly complement each other to advance current conservation efforts, as well as to achieve short- and long-term conservation goals.*
9. *Act now. Immediate planning and action are needed to better understand and address the impacts of climate change and to safeguard natural resources now and into the future.*

2012 National Fish, Wildlife and Plants Climate Adoption Draft Strategy Provided

SIGNIFICANT IMPACTS TO THE SISKIYOU 1 ROADLESS AREA. HABITAT CONNECTIVITY AND WILDLIFE CORRIDOR

The DEIS must address how road building, landing construction, ground based logging and canopy removal will not only effect connectivity but also the "untouched" character and visual quality of this area, especially from the Kelsey National Recreation trail. There is no doubt that one of the primary keys to species recovery and conservation is the preservation of a connected landscape. We must protect habitat connectivity for wildlife health and survival. In California, and especially in the northwestern part of the state, an outstanding opportunity exists for landscape connectedness and the preservation of wildlife corridor linkages, including the Siskiyou 1 Roadless Area.

Siskiyou 1 presently retains a roadless character, with the exception of a few roads.

Due to the topography and lack of current use, there are many opportunities for feelings of solitude and spaciousness in Siskiyou 1 through 5. The sights and sounds of human activities are confined to these areas near roads and to views from peaks.

The EVU for Siskiyou 1 is "untouched" with "alteration" around Lick Creek in the North.

A large portion of Siskiyou 1 is LSRs. A peregrine falcon eyrie is next to Siskiyou 1 in the south. There have also been sightings of fisher.

In Siskiyou 1 populations of summer steelhead can be found in Dillion Creek, North Fork Dillion Creek, Medicine Creek, Lick Creek and Swillup Creek.Several species of Sensitive plants have been identified in the released area. Lewisia cotyledon var. howellii has been found in Siskiyou 1, 3 and 5.

The Klamath River that borders Siskiyou 1 on the east is a National WSR, classified as Recreational. Three streams within the released area are being studied for inclusion in the WSR system.

Dillion Creek is one of the largest unroaded low elevation areas remaining on the Forest.

In Siskiyou 1 the combination of exceptionally steep slopes, abundant slump-earthflow deposits, pronounced inner gorges, and granitic rock render much of this segment prone to management associated landslides. Appendix C Klamath National Forest EIS Appendices C72-75

The National Fish, Wildlife, and Plants Climate Adaption Strategy's number 1 goal Is to conserve and connect habitat.

Goal 1: Conserve habitat to support healthy fish, wildlife and plant populations and ecosystem functions in a changing climate. Sustaining a diversity of healthy populations over time requires conserving a sufficient variety and amount of habitat and building a well-connected network of conservation areas to allow the movement of species in response to climate change. 2012 National Fish, Wildlife and Plants Climate Adoption Draft Strategy pg. 52 Provided

Effects of land-use change on the conservation of biodiversity have become a concern to conservation scientists and land managers, who have identified loss and fragmentation of natural areas as a high-priority issue. Despite urgent calls to inform national, regional, and state planning efforts, there remains a critical need to develop practical approaches to identify where important lands are for landscape connectivity (i.e., linkages), where land use constrains connectivity, and which linkages are most important to maintain network-wide connectivity extents. Theobald 2011 Provided

As noted in the California State Wildlife Action Plan 2005 (Provided) and multiple other studies on restoration ecology and biodiversity conservation. The designation of Late Successional Reserves was a good start but is this does not allow for continued connectivity (Zelinski 2006, Provided). For instance Regional managers should be aware and incorporate the information completed in the Essential Habitat Connectivity Report (Provided, emphasis added) quoted below:

The California Department of Transportation (Caltrans) and California Department of Fish and Game (CDFG) commissioned the California Essential Habitat Connectivity Project ***because a functional network of connected wildlands is essential to the continued support of California's diverse natural communities in the face of human development and climate change****. This Essential Habitat Connectivity Report includes a statewide map of Essential Connectivity Areas and an assessment of these areas and the lands they connect. It also describes strategies for maintaining and enhancing functional ecological connectivity through local and regional land-use and management plans. These tools and strategies are provided to assist all agencies and organizations involved*

in land-use planning, transportation planning, land management, and conservation in California with maintaining a connected California, while simultaneously making land-use and infrastructure planning projects more cost efficient. Essential Habitat Connectivity Report P.1. Provided

Many SWAPs (State Wildlife Action Plans) acknowledge the importance of wildlife linkage conservation and referenced specific habitats or general actions. However, most SWAPs did little more, with few identifying relevant geographic areas or developing maps. Conversely, interview responses from conservation professionals in the western United States overwhelmingly showed that wildlife linkage conservation is still a top conservation goal. These results reveal a discrepancy between the importance of wildlife linkages and the incorporation of wildlife linkage planning across the United States according to SWAP content. Lacher 2013 Provided

Climate Change and Wildlife Connectivity

Managing lands or species in the face of climate change requires an acknowledgement of both the range of different effects and the high levels of uncertainty involved in local projections. Additionally, projections are for climate, not weather. As such, they produce long-term averages. Organisms, including mammals, generally respond to weather events that deviate from the average such as droughts, extreme or unusual cold or heat, and storms. Thus, the weather that organisms actually respond to will be inferred from relatively broad-scale climate projections. Additional uncertainties exist in predicting mammalian responses to changing climate. Unforeseen opportunities and stressors can be expected—white nose syndrome, for example, was discovered in 2006 (16). However, these uncertainties do not preclude active management to conserve mammals, they simply change the nature of that management. Many approaches are generically beneficial for native species, and are particularly beneficial given climate change. These include:

1. *Maintain and if possible improve landscape connectivity.*
2. *Reduce stresses on current populations and habitats.*
3. *Maintain or improve current habitat for specific species.*
4. *Manage to maintain landscape diversity.*
5. *Monitor change.*

A connected landscape allows mammals to seek appropriate habitats and prevents the negative consequences of small isolated populations, such as increased extinction risks and lower fitness. Negative effects of climate change can be ameliorated by reducing other human-caused stressors (e.g. invasive species, development, overharvest). With higher fitness across habitats, organisms may be able to persist in what was formerly "sink" habitat, both increasing overall population size and range and increasing adaptive potential. Similarly, habitat improvement will help maintain a large, healthy population, which may improve its likelihood of persistence. Diverse landscapes increase overall resilience and provide opportunities for adaptation. Lastly, because climate change will lead to many unexpected ecological effects, systems must be in place*

to rapidly identify and monitor these effects and facilitate appropriate management responses.

- *Sink habitat = habitat that is currently occupied, but where populations cannot persist without external subsidies from organisms that emigrate from better quality areas.* McKelvey 2013-USDA

  http://www.fs.fed.us/ccrc/topics/wildlife/mammals/index.shtml

The DEIS should address the real threat of how disrupting landscape connectivity will effect climate change.

Global Significance

The DEIS should address and recognize the Global significance of the project area.

The Klamath-Siskiyou ecoregion of southwest Oregon and northwest California has long been recognized for its global significance (Whittaker 1960, Kruckberg 1984) and is considered an Area of Global Botanical Significance by the World Conservation Union (IUCN), a global Centre of Plant Diversity (Wagner 1997) and has been proposed as a possible World Heritage Site (Vance-Borland et al. 1995). More recently, World Wildlife Fund US scored the Klamath-Siskiyou as one of their Global 2oo sites reaffirming its global importance from the standpoint of biodiversity (Rickets et al 1999). Srittholt 1999 pg.1 Provided.

With its extraordinarily high biodiversity and physical heterogeneity, the Klamath-Siskiyou ecoregion warrants an ambitious conservation plan founded on scientifically defensible goals, such as those listed above. Srittholt 1999 pg.1

SIGNIFICANT IMPACTS TO NORTHERN SPOTTED OWL

Connectivity for the dispersal of forest-dependent organisms may decrease as fragmentation of the original forest matrix increases, resulting in the isolation of individuals and populations. The rate of successful dispersal of juvenile spotted owls (Strix caurina), for example, decreases in fragmented landscapes, thus influencing long-term population viability (Doak 1989; Miller et al. 1999). Swanson pg. 10 Provided

Balancing the goals of geographic distribution of reserves, and selecting reserves to maintain populations of individual species of concern (e.g., fishers, spotted owls) may require that the current Late-Successional Reserves network be augmented with new priority areas in high-value habitat areas in the most productive low- to mid-elevation forests of the west-central portion of our study. Zielinski 2006 pg.20 Provided.

Given the public trust duties for wildlife, the federal lands play a unique role in protecting biodiversity, including providing habitat for the area-limited focal species such as the spotted owl and the fisher. Zielinski 2006 pg.20

Northern Spotted Owl (NSO) is on a precipice and populations continue to decline across the region. Recovery of the species is mandatory under the Endangered Species Act and the California Endangered Species Act (CESA). The owl is currently a "Candidate" Species under the CESA.

In order to retain viable populations of Threatened, Endangered and Sensitive and other species the agency must stop removing and downgrading suitable habitat. The Klamath, Mendocino, Shasta-Trinity and Six Rivers, continue to remove and degrade habitat at an alarming rate on a continuous large-scale basis within Late Successional Reserves (LSR), Critical Habitat, NSO Activity Centers and Nesting/Roosting habitat. For instance the Klamath National Forest currently has three projects that are *"likely to adversely affect"* northern spotted owls and Critical Habitat. Those projects are the McCollins LSR, the Jess project and now the Crawford project. This coupled with the Fruit Growers Supply Habitat Conservation Plan, which is intersects significantly with the Klamath National Forest, proposes the "take" of up to 80 owls is extremely problematic to say the least.

The DEIS MUST have a detailed cumulative effects analysis for NSO's. Please be descriptive when analyzing NSO Activity Centers, current suitable habitat, territory habitat deficiencies and Critical Habitat. Please be explicit with the evaluation of the short-term impacts to NSOs and their prey especially in spotted owl core-use areas.

<u>Barred Owl</u>

Please be explicit when analyzing the effects of logging and the increased threat of barred owl invasion. The barred owl is currently displacing NSOs from historical breeding territories to such an extent that the extinction probability of pairs of NSOs triples in areas where barred owls are present compared to areas where they are not. Even when habitat for NSOs is available, the probability that NSOs will colonize this habitat is greatly diminished when barred owls are present. According to the KNF EIS there were barred owls in the Siskiyou 1 Roadless area in 1995.

Recent scientific literature provides an improved understanding about the interactions of the two owl species and the effects of forest management. The 2011 Recovery Plan relies on a recent "seminal study" that describes these interactions and management implications, titled "*Transient dynamics of invasive competition: Barred Owls, Spotted Owls, habitat, and the demons of competition present*" Dugger *et al*. 2011 Provided.

Dugger *et al*. (2011) recognize that the barred owl is currently displacing the NSO from historic breeding territories and that the extinction probability of pairs of NSOs in areas where barred owls are present is triple that of areas where barred owls are not found.

In other words, the fragmentation from past logging of older forests the NSO prefers has likely had the indirect effect of allowing the barred owl, which can live in younger and more fragmented forests, to move into the NSO's range. In short, logging turns spotted owl habitat into barred owl habitat.

We believe that the interactions between the species is a form of interference competition whereby Spotted Owls are driven from and excluded from their breeding territories by the larger and more aggressive Barred Owl. Northern Spotted Owls are food specialists, which prey on medium-sized arboreal mammals, whereas Barred Owls eat a broader range of prey items, which is likely the reason Barred Owl home ranges are 3-8 times smaller than those of Spotted Owls.

Barred Owls have been documented using a wider range of forest types (younger seral stages with more fragmentation) than Spotted Owls. Consequently, the loss of late successional old-growth forest and increased fragmentation of these forests will decrease the amount of suitable habitat for Spotted Owls. Dugger et al. (2011) Provided.

Please be descriptive when disclosing NSO survey results and disclose what protocol is being used.

Recovery Plan and Barred Owls

The Final Recovery Plan for the Northern Spotted Owl has partially addressed the barred owl issue by adopting Recovery Action 32 which urges the FS and BLM to "Maintain substantially all of the older and more structurally complex multi-‑layered conifer forests on Federal lands outside of MOCAs..." based on the idea that "protecting these forests will not further exacerbate competitive interactions between spotted owls and barred owls as would occur if the amount of shared resources were decreased." (FRP p 34). In considering this recommendation the agencies must prepare NEPA analysis which considers the full potential of suitable habitat quantity and quality and its mediating influence on the interactions between spotted owls and barred owls. Maintaining a subset of suitable habitat as recommended by the recovery plan is one option, but the agencies must consider the full benefits of protecting all suitable habitat, not just a subset.

It would be wise to do so at a range-‑wide level, but until that is done, the agencies should not adversely modify any suitable habitat. The recovery plan purports to offer the agencies an exception to the recommendation in Recovery Action 32 ("Land managers have made significant investments of time and resources in planning projects that may have been developed prior to the approval of this Recovery Plan, thus some forests meeting the described conditions might be harvested..." (FRP p 35)), however, FWS cannot exempt the action agencies from NEPA.

Protection of additional suitable habitat in order to reduce competitive interactions between the two owls is now a recognized tool in the toolbox and represents significant new information about any proposal to modify suitable habitat regardless of how far the planning process may have proceeded.

Owls and Fire

The issue of owls using burned habitat should be considered, given that part of the purpose and need for the project is to reduce fire size and severity. Spotted owls evolved with wildfire and it is an endemic part of any natural forest system in the west.

Furthermore (Bond 2009 Provided), has clearly demonstrated that owls not only use burned habitat, but they show a preference for foraging in severely burned habitat.

NSO Recovery Plan and Prey Species

The DEIS must analyze and disclose information on owl prey species and include the required short-term analysis of the project on the owl's prey species.

The ESA requires USFS to use the "best scientific and commercial data available" during consultation. 16 U.S.C. § 1536(a)(2). The 2011 Recovery Plan states it was developed using the best scientific information available. Specifically, the agency should use:

(1) data regarding the short-term effect of thinning and other management activities on the Owl and its prey;[1]

(2) data regarding the need for a more inclusive definition of high quality Owl habitat[2];

and (3) data regarding how thinning and other management activities increase competitive pressures on the NSO from the barred owl[3].

The KNF should analyze this new information. In 2011, a team of leading NSO biologists issued a comprehensive analysis of the Owl's status, titled "*Population Demography of Northern Spotted Owls,*" Forsman et al. 2011 Provided. The 2011 Recovery Plan relies heavily on the Forsman 2011 data and analysis to conclude that NSOs need sufficient and additional habitat protections "to address the threats the spotted owl faces from a loss of habitat due to harvest, loss or alteration of habitat from stand replacing fire, loss of genetic diversity, and barred owls." As Forsman et al. explain:

> *The fact that Barred Owls are increasing and becoming an escalating threat to the persistence of Spotted Owls does not diminish the importance of habitat conservation for Spotted Owls and their prey. In fact, the existence of a new and potential competitor like the Barred Owl makes the protection of habitat even more important, since any loss of habitat will likely increase competitive pressure and result in further reductions in Spotted Owl populations.*

[1] Studies from the 2011 Recovery Plan, that *address the adverse effects of timber harvest (primarily thinning operations) on NSOs include:* Forsman (1984), Zabel (1992), Buchanan (1995), Hicks (1999), Meiman (2003), Solis (1983), Sisco (1990), King (1993), Anthony and Wagner (1999), Irwin (2005), Irwin (2008), Irwin (2010), and Hansen and Mazurek (2010)(summarizing these studies).

Additional studies from the 2011 Recovery Plan, specifically *address the adverse effects on the NSOs prey from thinning*: Waters (1994), Colgan (1999), Luoma (2003), Meyer (2005), Carey (1992), Carey (2000), Wilson (2010), Williams (1992), Innes (2007), and Lehmkuhl (2006a).

[2] Including studies from the 2011 Recovery Plan, Recovery Action #10, and Forsman (2011).

[3] Including studies from the 2011 Recovery Plan and Dugger (2011).

This new approach and information is also discussed in the 2011 Recovery Plan under Recovery Action #10. Recovery Action #10 is intended to use habitat modeling to better identify those areas where land managers should better protect, enhance and develop habitat in the quality and distribution necessary to provide for the long-term recovery of spotted owls. Where modeling outputs and on the ground examinations indicate that vegetation management activities can improve long-term habitat conditions, they will be encouraged even if it may result in short-term impacts, *but only if a determination is made that these longer term goals outweigh short-term impacts*.

Please consider Recovery Action #10 in the 2011 Recovery Plan, which states, in the interim, while modeling is conducted, **"[l]and managers should generally avoid activities that would *reduce* nesting, roosting and foraging habitat within provincial home ranges (e.g., 1.3 mile radius) of reproductive pairs."**

Scientific peer reviewers and Forsman et al. (2011) (attached) recommended that we address this downward demographic trend by protecting known spotted owl sites in addition to the retention of structurally-complex forest habitat. NSO Recovery Plan III-42

Thinning and Owls

Thinning in suitable owl habitat will degrade not restore owl habitat. Dellasala 2012. Provided.

Seamans and Gutierrez 2007 (Provided) found that mechanical treatments (e.g., thinning) of as little as 20 hectares (about 50 acres) within the 400-hectare home range core area of spotted owls reduced colonization of territories by spotted owls, and increased the probability of breeding dispersal away from territories—both substantially negative indicators for spotted owl conservation.

Again the DEIS should analyze and disclose the impacts of their logging proposals on spotted owl Nesting Roosting and Foraging (NRF) habitat. The DEIS should mention where, how much and/or what types of habitat is proposed for treatment including, Critical Habitat, Activity Centers and 100 acre LSR's.

The use of language descriptive of habitat does not change the underlying fact that the proposed actions are based in very large part on the desired silvicultural prescriptions. While such technical concerns are of course relevant to forest management, they are a dangerously incomplete guide to the restoration and conservation of habitat. This is highly relevant to the question of NSO habitat, of course, because the single-minded pursuit of silvicultural objectives was the single most important reason for the current condition across the Klamath National Forest, and throughout the NSO's range. The absence of applicable scientific evidence will increase our concern that the Forest Service is continuing to pursue silvicultural objectives at the cost of wildlife habitat values. It would be arbitrary and capricious for the Forest Service to follow such a course. The Forest Service must, at the very least, disclose the likely negative effects for NSO's and other species dependent on mature and late-successional forests.

Protecting habitat is of utmost importance for the NSO given the continuous threats the species is up against. What had been viewed, as less-than-significant impacts on NSO may now need to be evaluated much more critically, with an eye to a regional conservation strategy rather than one that spans the entire NW Forest Plan area. Reconstructing roads and landings and entering natural stands would degrade suitable habitat.

Recent significant information regarding NSO population decline across its range, and the emergence of new threats not contemplated when the Northwest Forest Plan or the Klamath LRMP were signed. The Forest is required to consider and disclose information that contradicts the assumptions of the Forest Plan and the LRMP during planning. We urge the agency to avoid actions (such as landing construction, road reconstruction and commercial thinning) that will remove or downgrade suitable habitat for this federally listed and State listed "candidate" species. We believe that logging activities (singularly and cumulatively) such as road and landing construction, RR entry, and reduction in canopy is a significant issue.

SIGNIFICANT IMPACTS TO FISHER

Conservation of area-limited species (sensu Lambeck, 1997) is one avenue to attempt to protect other species with which they share habitat and to protect the structures and ecological functions that sustain them (Noss and Cooperrider, 1994). The spotted owl (S. occidentalis) and the fisher (Martes pennanti;) have disproportionately large home ranges (3–10 km2 for the spotted owl (Gutierrez et al., 1995) and 4–90 km2 for the fisher (Zielinski et al., 2004a)), qualifying them as area-limited focal species for conservation planning. The microhabitat and landscape features selected by fishers for resting (Zielinski et al., 2004a; Zielinski et al., 2004b) appear similar to the nest and roost structures used by northern spotted owls (Blakesley et al., 1992; Hunter et al., 1995), but there has been no formal comparison of owl and fisher habitat at any scale of reference.
Zielinski 2006 pg.2 Provided

The fisher was identified among the species of mammals with the lowest likelihood of remaining well distributed under the proposed management option (USDA Forest Service and USDI Bureau of Land Management, 1993), but this was due to general uncertainty about its welfare, independent of the management option that was considered (USDA Forest Service and USDI Bureau of Land Management, 1993). Now, however, the precarious status of fishers in the Pacific states is well documented (Zielinski et al., 1995; Aubry and Lewis, 2003; US Fish and Wildlife Service, 2003; Zielinski et al., 2005) making it important to determine how well the system of Late-Successional Reserves, and other land management decisions instituted by the Northwest Forest Plan, serve the fisher's habitat needs. Zielinski 2006 pg.*2*

Summary of Findings

1. ***The distributions of American martens and fishers in the Sierra Nevada and southern Cascade region have decreased, and both species are expected to suffer additional habitat loss under changing climatic conditions.*** *Habitat selection by both species*

occurs at multiple spatial scales, ranging from microsite conditions to landscape configuration.

2. ***Resting and denning structures are probably the most limiting hab tat element for fishers and martens.*** *Because fishers and martens are nomadic within defined ranges (i.e., they move between rest sites on a daily basis outside the denning season), they require resting structures and resting habitat that are well distributed across the landscape and are sensitive to changes in landscape configuration.*
3. ***High canopy cover and large trees and snags are important components in both fisher and marten resting habitat.*** *Results suggest a minimum canopy cover target of approximately 60 percent for fishers and 30 percent for martens. Fishers prefer shade-intolerant species such as oaks and pines while martens use firs and lodgepole pines. Both species select sites characterized by complex vertical and horizontal structure.*
4. ***Recent findings support recommendations for focusing habitat management for fishers and martens in areas where fire would have burned less frequently historically, such as north-facing slopes, can- yon bottoms, and riparian areas.***
5. ***Two new analysis tools may be helpful for predicting management impacts on fisher populations.*** *One tool allows the quantitative evaluation of proposed treatments on fisher resting habitat using FIA data (Zielinski et al. 2006, 2010). A second analysis tool uses growth and disturbance models, combined with landscape trajectory analysis, to provide a visual, intuitive representation of the predicted risk*

of potential management actions on fisher habitat at the home-range scale (Thompson et al. 2011). Purcell et al. Provided

For fishers in particular, maintaining habitat in riparian areas and on topographic positions that normally did not burn frequently or severely (North et al. 2009) may help provide connectivity without significantly reducing the effectiveness of fuel reduction efforts. New analytical tools (i.e., Thompson et al. 2011, Zielinski et al. 2010) should be evaluated to assess projected effects at home range and landscape scales.

We still lack important information about reproductive site characteristics for these species, including their requirements for den trees and denning habitat at multiple spatial scales. As suggested in North et al. (2009), one way to help ensure the retention of key forest structures would be to provide a list of attributes and rep- resentative photos of resting and denning structures for use by marking crews (fig. 4-1) (see Lofroth et al. 2010 for descriptions of the specific types of structures used by fishers for resting and denning). Because most disturbances in fisher and marten habitat will be the result of treatments to reduce fuels and control forest pathogens, it is important to conduct rigorous studies on the effects of fuel treatments on fish- ers, martens, and their prey. Also, we know very little about the effects of manage- ment activities on important fisher and marten prey species or foraging behavior (Martin 1987). Addressing these information needs will lead to better informed management decisions and a greater likelihood that forest managers can provide the habitat conditions needed to support viable fisher and marten populations. Purcell et al. P54

http://www.fs.fed.us/psw/publications/documents/psw_gtr237/psw_gtr237_047.pdf

In the annual Candidate Notice of Review, issued by the FWS each year, the FWS reiterated the concerns highlighted in the fisher's warranted but precluded determination, noting that "extant fisher populations are small and isolated from one another" and that "[m]ajor threats that fragment or remove key elements of fisher habitat include various forest vegetation management practices such as timber harvests...." 71 Fed. Reg. 53777 (Sept. 12, 2006).

> *Natal den sites and resting sites tend to be in large (> 100cm dbh) hollow trees and snags (Zielinski et al. 2004, Aubry and Raley 2002). They seem to require multiple resting sites distributed throughout their home range (Zielinski et al. 2004).*
>
> *The primary foods of fishers are snowshoe hares (Lepus americanus), porcupines (Erethizon dorsatum), mice, voles, and carrion (Jones 1991, Powell 1977). Fishers forage in a variety of vegetation types, and seem to select areas with 60-100% canopy cover (Powell and Zielinski 1994, Zielinski et al. 2004).*
>
> *Fishers are associated with large blocks of mid- and late-successional conifer and mixed conifer- hardwood forests (Jones 1991, Jones and Garton 1994, Carroll et al. 1999). They usually select stands with dense canopy closure, vegetation structure characterized by fine-scale heterogeneity, abundant amounts of woody detritus (Powell and Zielinski 1994), and avoid forest openings (Buskirk and Ruggiero 1994, Jones 1991, Jones and Garton 1994).* McComb, 2007 Provided

From the 2010 California Fisher Status Review-

Population Trend
As there are no empirically-based population data for fisher in northern California, the Sierra Nevada, or statewide, there similarly is no capability to accurately determine population trend.

The Department considers the harvest of late successional forest, especially removal of key habitat elements (large conifers and hardwoods with cavities and other structures suitable for resting and denning) to be a potential threat to fisher. Younger stands with high canopy cover may provide suitable foraging and dispersal habitat, and stands with sufficient late seral habitat elements may be suitable resting and denning habitat. Threats to fisher from timber harvest involve the opening of forest canopy, removal of understory vegetation and coarse woody debris, and the removal of important structural components (large trees and snags with cavities for den and rest sites).

Impacts can result from various silvicultural treatments and can occur at various scales. The selective removal of large trees, decadent trees, snags, and large diameter downed logs from managed stands during harvests can reduce available denning and resting sites. Regeneration harvests may remove both overstory and understory vegetation, potentially rendering harvest units unsuitable for fisher reproduction for many years and unsuitable for foraging until relatively dense overhead cover is re- established. Site

preparation and plantation management may remove and/or simplify understories, also decreasing foraging and cover value for fishers. However, the potential significance of these impacts is dependent on their size and landscape context. At a landscape scale, the abundance and distribution of fishers is likely to depend on the size and suitability of patches of habitat, and the location of those patches in relation to areas of unsuitable habitat. DFG California Fisher Status Review 2010 Provided

For the Pacific fisher, marten as well as the NSO, and goshawk, it is imperative to maintain at least 60 percent canopy closure and retain all old growth and late successional character trees for resting and shelter. From the Zeilinski studies canopy closure at rest sites were 60 percent or greater, and the trees were often larger than 24 in. dbh. Not logging RRs helps the Fisher as well as they often forage and rest near water sources. Project planning should address the potentially deleterious impacts of any proposed action intended to reduce fire risks on habitat. For example, the Fisher may benefit from the large amounts of down woody material, which is likely to develop if existing late-seral trees and stands are not logged.

It is essential that surveys be conducted for Pacific Fishers and that the Forest Service discloses the impacts of the proposed project on Fisher *populations* and habitat.

<u>HUMBOLDT MARTEN</u>

> *The Humboldt marten (Martes americana humboldtensis) has been extirpated from >95% of its historical range and is known from only a single population.*
>
> *The Humboldt marten (Martes americana humboldtensis) was feared extinct (Zielinski and Golightly 1996) until 1996 when a marten was detected in the north- central portion of the historical range (Zielinski et al. 2001). Despite extensive survey efforts throughout much of the historical range, only a single small population of martens has been documented to occur, occupying an area representing <5% of the subspecies' original range (Slauson and Zielinski 2004). Recent survey efforts in the southern portion of the historical range failed to detect martens in coastal (Douglas and Holley 2009) and interior Mendocino county (Slauson and Zielinski 2006a), strengthening the case for this being the only population remaining in the historical range.*
>
> *The American marten is a 'Sensitive Species' in Region 5 of the Forest Service (Macfarlane 1994), a 'Species of Special Concern' for the California Department of Fish and Game (Bryliski et al. 1997), and was recognized as a priority species in FY2007 for the Region 5 Sensitive Species Program. The Forest Ecosystem Management Scientific Analysis Team (USDA, USDI, USDC 1993) gave the American marten the second- poorest score among mammals for the assessment of their habitat and distribution under option 9, with only a 67% likelihood of remaining well distributed (category A) and a 27% likelihood of becoming locally restricted (category B). In reality, the situation is far worse, martens on federal lands in the Coast Range of California are restricted to a single refugia (category C) and have been extirpated from a significant portion (>95%) of their historical*

range. Within their last stronghold, measures including the protection of Riparian Reserves, Late-Successional Reserves, northern spotted owl and marbled murrelet conservation measures, do not completely protect the population Martens have been shown to be very sensitive to relatively low levels of forest fragmentation, with several studies demonstrating that martens do not persist in landscapes where >30% of mature forest cover is lost.

MANAGEMENT IMPLICATIONS

The causes of the decline are unknown at this time. We cannot determine whether it is part of a natural population fluctuation or whether it is related partially or entirely due to human-caused factors. Given that the most optimistic population estimate is <100 individuals in 2008, conservation actions to benefit this remnant population are needed immediately. Specifically, a population research and monitoring program should be put into place to monitor the population to specifically determine whether there is a declining trend in the population or whether the population will rebound. If the cause(s) for decline are identified, management actions can be taken to address any identified threats.
Slauson 2009 Provided

The American marten is a housecat-sized, forest-dwelling weasel in the mustelidae family. They are among the most habitat-specific mammals in North America and prefer late-successional, closed-canopy stands of mesic conifers (Harris 1984, Buskirk and Powell 1994). The marten is arguably the best candidate for a forest carnivore indicator species based upon its close association with late-successional forests and its sensitivity to habitat fragmentation (Buskirk and Powell 1994, Bissonette and Broekhuizen 1995). They are commonly regarded as indicators of ecosystem integrity and their decline in western states has increased conservation concerns among wildlife biologists and resource managers (Buskirk and Ruggiero, 1994). The marten has experienced an apparent loss of occupied range over the last 75 years in northeastern California, a region that has seen several top mammalian predators extirpated (Zielinski et al. 2005). Extinction selectivity, or relative vulnerability, is non-random and individual traits make some species more extinction-prone than others (McKinney 1997). Martens possess many of the life history traits that promote species risk and make them vulnerable to extinction including: specialized habitat preference, restricted distribution, low fecundity, high trophic level, and less adaptable behavior patterns (Buskirk and Powell 1994). Forest carnivores have been a focal point of many conservation efforts because of their association with late-successional forest habitats and their large home range sizes (Noss et al. 1994, Buskirk and Powell 1994).

Studies conducted elsewhere in North America have documented that martens are sensitive to forest fragmentation and to thresholds in landscape- scale characteristics (Bissonette et al. 1997, Hargis et al. 1999, Chapin et al. 1998).

Conservation biologists have suggested a focus on preserving the remaining late-successional forests and maintaining adequate habitat connectivity to ensure forest carnivore population viability (Noss et al.1997). Kirk 2006 Provided

The DEIS must analyze and disclose the effects of proposed Crawford activities on the Humboldt Marten and also survey for these species.

GOSHAWK

Many of the above NSO/Fisher/Marten comments apply in equal strength to the goshawk. We would like to reiterate a 60-‑80 percent canopy closure is vital for the goshawk and keeps out competitors.

Goshawks nest in a variety of habitat types-‑from willow stands to massive old growth forests of the Pacific Northwest; however, goshawks in northern California prefer mature and old-‑growth conifer forests that have relatively dense canopy closures, have usually little understory, and are in close proximity to riparian corridors.

"Planned timber sale areas should be surveyed to Region 5 protocol for goshawks for a minimum of 1 season (intensive protocol) or 2 seasons (broadcast only)." LRMP 4-‑38 Please include the results from required surveys for the project in the DEIS.

MANAGEMENT INDICATOR SPECIES

The DEIS should contain analysis of MIS populations, and acknowledge that they exist, and take the "hard look" at environmental impacts that NEPA requires.

Please note that in Utah Environmental Congress v. Zieroth, 2002 WL 406715; --- F.Supp.2d (D. Ut. 2002) the Federal District Court held that Service's use of habitat trend data rather than actual or trend population data to analyze effect of proposed timber clearing project on management indicator species was insufficient to comply with requirements of National Forest Management Act (NFMA).

The National Forest Management Act (NFMA) imparts on the Forest Service a substantive duty to provide for the diversity of plant and animal communities on National Forests. 16 U.S.C. § 1604(g)(3). To achieve this goal, the regulations implementing NFMA specify that the agency ensure that viable populations of native animals are maintained by monitoring the impacts of the Forest Plans on selected MIS. 36 C.F.R. § 219.19(a)(6).

The Biological Evaluation (BE) is required to "ensure that Forest Service actions do not contribute to loss of variability of any native or desired non-native plant or contribute to animal species or trends toward Federal listing of any species," and to "provide a process and standard by which to ensure threatened, endangered, proposed, and sensitive species receive full consideration in the decision-making process." F.S.M. § 2672.41. To accomplish this task, BE's are required to assess cumulative effects of the proposed

activity in relationship to all past, present, and reasonably foreseeable future actions regardless of what agency (Federal or Non- federal) or person undertakes such other actions. 40 C.F.R. § 1508.7; F.S.M. § 2672.42.

The findings of the DEIS and Wildlife BA/BE must provide the decision maker and the public with enough information to conclusively know that the project will have no significant effect on threatened, sensitive, and management indicator wildlife species. 40 C.F.R. § 1508.27.

The DEIS should substantively address the cumulative watershed effects of all actions in the affected watersheds and the impact on MIS.

"Snag-associated" MIS species may lose habitat due to proposed logging units, in proposed landings, fuels treatment areas and along haul routes. Population numbers and trends have thus far not been analyzed by the agency.

To assert that "[c]ollecting population data is not a requirement" for imperiled species and MIS is, essentially, to say that the KNF can legally manage the habitat on public lands on the basis of projections of what might, or ought, to be happening with respect to wildlife populations, without regard to what the facts might actually be. This cannot be correct. If the purpose of designating MIS is to use their population changes to assess the "effects of management activities," then the Forest Service must actually attend to those population changes, which cannot be done without "collecting population data." Therefore, assessing population levels, distribution, and trends is in fact critical to assessing not only the effects of management actions, but also to evaluating the accuracy of the habitat capability models which the agency uses to estimate the relationship between habitat and population levels for imperiled and MIS species.

Lastly, the FS may wish to re-familiarize itself with the holding in KS Wild v. USFS, Eastern District of California 2004, in which the federal district court held that the Klamath National Forest violated its LRMP, and NFMA, by failing to monitor and survey for snag associated MIS species.

Information describing current snag levels and population surveys should be completed for MIS species within the project area. Please do not fail to substantively address the cumulative watershed effects of all actions in the affected watersheds and District and the impact on MIS by discounting cumulative impacts as individually minor impacts without examining their collective significance.

SURVEY AND MANAGE SPECIES

The scoping notice contains information about the influence of surveys on project layout and design. The forthcoming DEIS must disclose the timing, results and influence of surveys.

Please be advised that pursuant to the 2001 S&M ROD the government placed some hard-to-survey species in a category that required strategic surveys by a certain date, and if/when that deadline was missed, the USFS is required to stop logging LSOG forests OR

complete "equivalent effort surveys." Currently Equivalent Effort Survey are required for Nine species:

- Lichens: Bryoria subcana, Tholurna dissimilis
- Bryophytes: Kurzia makinoana, Marsupella emarginata v. aquatica, Orthodontium gracile, Tritomaria exsectiformis
- Mullusks: Deroceras hesperium, Hemphillia pantherina, Monadenia chaceana.

The Forest Service must not rely on the illegal non-NEPA plan amendment "of the 2003 Annual Species Review" to avoid surveys that were anticipated by the Northwest Forest Plan and the Six River LRMP. The Forest Service cannot rely on non-NEPA documents to significantly amend the Northwest Forest Plan and the LRMP so-as to expedite regeneration logging. See KS Wild v. Boody, 9th Cir 2006. No. 06-35214 (CV 03-3124, District of Oregon).

We note that your Land Resource Management Plan, the Northwest Forest Plan rely on the assumption that the survey and manage program will be faithfully implemented.

NEOTROPICAL MIGRATORY BIRDS

Accepting that real declines are occurring raises the question of the cause of these population declines. Further research into the possible weather, climactic, and anthropogenic causes of observed population trends and the demographic mechanisms of these trends are necessary to address the causes of these declines. We suggest a raised concern for understanding the conservation biology of species we have found to be declining locally and regionally, and the strong negative strength of these declines indicates the problem may be urgent. Alexander 2005 Provided

The regional decline of migratory birds is a significant issue for this project. Numerous studies have reported local and regional trends in breeding and migratory bird populations throughout North America (e.g., DeGraaf 1995, Sauer et al. 2004). These studies suggest geographically widespread population declines that have provoked conservation concern for birds, particularly neotropical migrants (Askins 1993, Terborgh 1989.) Alexander 2005 pg. 4

The 2005 report, Alexander 2005, from the Klamath Bird Observatory entitled Local and Regional Trends in Breeding and Migratory Bird Populations in the Klamath and Rogue River Valleys: Monitoring Results for 1993-2003 indicates that several species on songbirds are suffering declining population trends at the regional level.

The DEIS for this project should analyze and disclose the potential impacts of conifer thinning operations and brush removal on neotropical bird population trends.
The cumulative effects analysis on migratory birds should not rely exclusively on Wilderness, Riparian Reserves and LSRs to provide for species viability into the future, because many Forest Service and BLM Districts are actively logging those land use allocations, regardless of the effects on migratory birds, despite their reserve status. Simply concluding that the scale of the project is small, relative to the size of the forest, that migratory bird populations will not be affected will not suffice. As you know, the

Spotted Owl was driven into threatened status by lots of "little clearcuts" that individually were insignificant, but cumulatively resulted in significant habitat loss.

ISOLATED WILDLIFE POPULATIONS

Protecting a diverse group of different populations of a species is what guarantees both biological diversity and the long-term viability of a species.

Many wildlife populations are under incredible threat, and losing them one after another erodes the survivability of the species to which they belong. Conservation law's traditional focus on species often causes people to assume that losing local populations doesn't matter as long as other populations still exist elsewhere. That couldn't be farther from the truth, though: for many threatened species that were once widespread, their final extinction is merely the extinction of the last local population. Their fate may have been sealed long before with the loss of a minor local population that pushed the species below the threshold of viability.

GRAY WOLF

The Gray Wolf is currently a "candidate" species under the California Endangered Species Act and is also listed under the federal Endangered Species Act. Please analyze and disclose how project activities will effect wolf habitat and prey species.

SNAG REQUIREMENTS

"Retain snags with the largest DBH as they tend to last longer and make the best wildlife habitat."-- LRMP 4--39

We would like to reiterate the need for maintaining snags and accounting for snag recruitment. As per the LRMP, snag retention is based on a per acre requirement and is not at a landscape scale as stated in the scoping notice.

ECONOMICS AND ECOLOGICAL COSTS

Economics

FY 2013 Budget Justification USDA Forest Service states:

Principal Programs to Achieve Goal 1: The largest budgetary investment for maintaining forest and rangeland health, productivity, diversity, and resistance to disturbance is supported from Wildland Fire Management.

Wildland Fire Management recognizes the importance of integrating fire as a critical natural process in land and resource management plans and activities, managing wildfire across landownership boundaries, and applying the best available science

In addition, dozens of CFLR proposals, from across the country, that had not been referred to the Secretary for award are poised—to some degree—to begin soliciting stewardship contracts and agreements. FY 2013 Budget Justification USDA Forest Service Pg. 36 Provided

Triple Bottom Line Approach

The Regional Forester's approach to restoration embraces ecological, economic and social outcomes, however as long as there are incentives that require each national forest to "get the cut out" to meet timber targets and quotas in order to receive funding- true ecological restoration may not be realized. As we see and often witness, authentic fuels treatments are tied to subsidized timber sale contracts that target big old fire resistant trees and remove vast amounts of canopy for the benefit of corporate logging companies. This business as usual approach is contrary to forest health, fire resilience, community protection and restoring species populations.

Fix the Foundation

The current USFS Timber Sale Program is greatly subsidized and costs taxpayers millions of dollars every year. The only entity to profit off of logging our public lands and National Forests is the timber industry.

Although the USFS timber sale program is a huge money loser, individual districts are rewarded financially for completing timber sales. At the same time, the logging companies profit from taxpayer-subsidized, below-cost timber sales. So both the USFS and logging companies have a strong incentive to push for more commercial logging on national forests, even when the effect is harmful to our public lands, wildlife habitat and populations.

Please recognize and disclose this reality in the DEIS. Better yet, we urge you to consider alternative funding sources such as NRCD funds that are currently available for the project area. Please honestly consider Stewardship Contracting that could employ the local work force as Region 5 has supported.

Ecological Costs

Two of the most central topics in understanding forestry and the conservation of biodiversity in the Pacific Northwest reflect these concerns: the structural simplification of forest stand structure in forest stands due to timber harvest and regeneration practices, and the fragmentation of formerly contiguous forest patches at the landscape level (Noss 1999). Swanson 2005 pg. 2 Provided

Less well-known, but still ecologically important, organisms may also decrease in fragmented landscapes. Certain epiphytic lichens, such as the nitrogen-fixing Lobaria oregana, encounter dispersal problems across early-successional habitats, a primary reason why they predominantly occur in old-growth forests (Sillett et al. 2000). Edge

effects may also reduce the amount of area available in a landscape for organisms such as birds (Lehmkuhl and Ruggiero 1991), lichens (Rheault et al. 2003), certain understory plants (Nelson and Halpern 2005), and bryophytes (Nelson and Halpern 2005). Swanson pg.10

The loss of old-growth forests to timber harvest and land-use conversion has resulted in a condition of fragmentation, creating spatial isolation of remaining patches and significant reductions in interior habitat conditions required by certain organisms. Swanson 2005 pg. 2

Decision makers, scientists, and the interested public now recognize that there is an urgent need to restore forest ecosystems after decades of intensive logging, fire suppression, road building, live- stock grazing, mining, and invasions by exotic species (see Noss and Cooperrider 1994, Ricketts and others 1999, Pimmentel and others 2000 for reviews). Such damaging activities have compacted soils, channelized streams, fragmented forests, suppressed natural fire, assisted the spread of some invasive species, and caused the loss of native species and their habitat (Noss and Cooperrider 1994, Heilman and others 2002). DellaSala 2003 pg.1 Provided

There is a need to recognize that a thinned forest is not the same as a natural forest: countless biological components are either lost or disrupted by thinning with unpredictable consequences. Some forest processes, including the processes of recycling of nutrients by insects like terminates and bacteria and fungi can only take place in what might be considered messy, dense, degraded, fuel-laden, and decadent forests. Many larger species rely on those areas for their very survival.

Please honestly recognize and disclose the very significant ecological costs of the Crawford project for all of the reasons discussed throughout these comments.

IMPORTANCE OF LARGE TREES

The levels of old growth over a large portion of the Pacific Northwest are so low that even seemingly minor adjustments in policy or management can have a profound impact. If all the remaining old growth on public land were protected, roughly 21% of the historical area of old growth would not be subjected to industrial development. And although 21% seems like a luxury compared with many regions, it still may be insufficient to maintain all of the old-growth forest values present in the region. Thus, although the plan was a major leap in land-use planning and conservation over large landscapes of the federal land base, the process of adaptive management, a key concept from which the plan evolved, should now respond to new research that has emerged. This research and the growing public interest in protecting older forests support the conservation need to set aside old- growth forests on federal lands and to manage the maturing conifer forest to reach old-growth condition to ensure that the many biological values associated with older forests are maintained in perpetuity. Strittholt 2006

Large old trees are among the biggest organisms on Earth. They are keystone structures in forests, woodlands, savannas, agricultural landscapes, and urban areas, playing

unique ecological roles not provided by younger, smaller trees. However, populations of large old trees are rapidly declining in many parts of the world, with serious implications for ecosystem integrity and biodiversity. Lindenmayer 2012 Provided

"*An increase in use by the Forest Service of the commercial timber sale program to "restore" federal lands poses risks that logging will adversely affect fish and wildlife habitat and ecologically sensitive landscapes*." DellaSala 2003, Provided

"Regulations governing current logging practices and advances in technology have substantially improved timber-harvest practices. However, some ongoing management practices continue to adversely affect the vegetation communities and wildlife habitats of forest systems." SWAP p.254

Please keep in mind that trees absorb carbon dioxide for use in photosynthesis, making them one of the most effective natural tools to remove the greenhouse gas from the atmosphere. Again, it is imperative to retain dense stands and canopy on north and east facing slopes in regards to climate change as these areas will provide the highest amount of refugia for plant and animal species as described in Olsen 2012.

Attention should be given to protecting large and old trees. Large fir trees, especially those with heartwood decay, provide important habitat for many species, and efforts to "cleanse" the landscape of true firs should be avoided.

At the same time, it is important to keep the large trees, and conversely lower the density of the small ones. The efficacy of reducing the crown density depends largely on a tree removal process that does both: reducing crown density while keeping the large trees. It's also important to remember that as thinning intensity increases, there are tradeoffs with surface fire intensity caused by drier surface fuels and increased mid-flame wind speeds in the thinned stands. Often in the debates about active management, we hear, "Oh, we must thin the stand to save it!" But thinning comes in many forms, and only some forms will result in a firesafe forest condition. Consider three types of classic thinning. A low thinning removes trees from below: the smallest ones. Agee 2007. Provided.

Rather than list and cite the scores of scientific studies supporting the retention of big old fire resistant trees and forest canopy for ecological health and resilience we are attaching a Policy and Technical Analysis entitled *Ecologically Appropriate Restoration Thinning in the Northwest Forest Plan Area* composed by Andy Kerr of the Larch Company dated June 2012. This report addresses only one element of terrestrial restoration and focuses solely on the commercial timber volume that can come as a byproduct of Ecological Restoration Thinning (ERT). ERT itself does not constitute full forest and watershed (including aquatic) restoration, and therefore cannot achieve all desired objectives, including restoring water quality and wild fish populations.

The following section is provided to demonstrate a small portion of scientific literature supporting the retention of large trees on the landscape (these referenced studies are not provided, except if noted, and we have a separate list of references for this section).

Research demonstrates no advantage in short-term fire hazard mitigation resulting from "comprehensive" thinning treatments that remove trees in all size classes compared to treatments that retain large trees (Fiedler and Keegan 2002). Indeed, thinning treatments that only removed trees smaller than 16" dbh were more effective at reducing long-term fire hazard than so-called "comprehensive" treatments (Fiedler and Keegan 2002). Thinning small trees and pruning branches of large trees to increase their crown base height also significantly decreases the likelihood of canopy fire initiation (Graham et al. 2004, Perry et al. 2004). Low thinning and underburning to reduce surface fuels and increase canopy base height at strategic locations relative to local topography and modeled 90th percentile weather conditions can effectively reduce fire hazard and meet the purpose and need for action (Finney 2001).

Conservation of large trees in fuel treatments is fundamentally important to restoration of fire-adapted forest ecosystems (Brown et al. 2004, DellaSala et al. 2004 Provided). Large ponderosa pine trees possess autecological characteristics such as relatively thick bark and insulated buds that promote resistance to heat injury. In addition, self-pruning mature ponderosa pines feature high branch structure and open canopies, which discourage torching (Keeley and Zedler 1998). Finally, mature ponderosa pines have a high capacity to survive and recover from crown scorch (McCune 1988). Thus, the existence of large tree structure enhances ecosystem fire resilience, particularly where fire effects to soil and understory vegetation are severe (Arno 2000, Pollett and Omi 2002).

Large tree conservation avoids significant cumulative effects. Large trees are the most difficult of all elements of forest structure to replace once they are removed (Agee and Skinner 2005). Further, large trees are not particularly abundant. The proposed action will remove forest structure that otherwise would contribute to future recruiting of old growth forest. Therefore, removal of large forest structure in the instant action presents a potentially significant cumulative effect to old growth resources in the long-term.

Large tree conservation retains wildlife habitat. If reduction of crown bulk density within clumps and stands of mature trees is necessary to meet the purpose and need for action, then it is unlikely that the project will maintain habitat for sensitive wildlife associated with closed-canopy forest.

Logging in the Crawford project may retard or preclude recruitment of old growth forest over time. Modeling and other lines of scientific evidence show that logging significantly reduces the number of live trees, which unavoidably reduces the pool from which future dead trees are recruited. Logging may increase the vigor of retained trees, which sounds good to foresters and lay observers, but enhanced tree vigor diminishes important ecological processes such as tree mortality and insect activity that function to develop and maintain old growth forest over time. As shown in numerous analyses conducted by the Forest Service and others, logging effects on recruitment of coarse wood and old growth are significant (Quigley et al. 1996, Spies 2004, van Mantgem et al. 2009). Lost recruitment potential of old growth forest due to removal of existing large trees and coarse woody structure presents a potentially significant cumulative effect to the planning environment that must be studied in an DEIS.

Large Trees and Mistletoe

The Forest Service ignores its own research on contributions of dwarf mistletoe to old growth forest and wildlife habitat and food resources. Agency research (Hawksworth and Wiens 1996: 127-128) shows that dwarf mistletoe significantly contributes to desired conditions for the Crawford project area:

Effects of dwarf mistletoes on old-growth stands have received relatively little study. Previously, emphasis has been primarily on harvesting old-growth stands and regenerating the areas with mistletoe-free stands. With an increasing emphasis toward preserving old- growth forests, however, information on the effects of pathogens in such stands in becoming more important. By inducing formation of witches' brooms and causing topkill and mortality of host trees, dwarf mistletoes affect the species composition, vertical crown structure, and spacing of trees within infested stands. These direct effects, in turn, have numerous consequences on the physical structure and functioning of the ecosystem. For example, the brooms provide forage, nesting, and cover for birds and mammals, but also increase the likelihood of ground fires becoming crown fires. Canopy gaps caused by mistletoe-induced mortality increase within-stand diversity but also reduce the interior- forest area.

Indeed, tree mortality caused by dwarf mistletoe infection creates natural openings and structural heterogeneity. These are the desired conditions. The major difference between forest openings and structural diversity naturally created by dwarf mistletoe and the regulated uneven-aged management approach of the Forest Service is that the agency wants to "allow for healthy natural regeneration" in openings created by group selection cuts of mistletoe-infected trees. *Id.* at 24.

Trees infected with dwarf mistletoe can directly or indirectly benefit wildlife (Filip 2005). Many vertebrate animal species consume mistletoe shoots and fruits, and use brooms for cover and as nesting sites (Hawksworth and Wiens 1996). Clary and Larson (1971) found that in certain years, ponderosa pine stands with dwarf mistletoe shelter significantly more deer than stands without dwarf mistletoe.

LARGE TREES, FORESTS AND CARBON SEQUESTRATION

Thus, large, old trees do not act simply as senescent carbon reservoirs but actively fix large amounts of carbon compared to smaller trees; at the extreme, a single big tree can add the same amount of carbon to the forest within a year as is contained in an entire mid-sized tree. Stephenson et al. 2013 http://www.fs.fed.us/ccrc/

Obviously, planned logging and burning and taking out vegetation for other reasons do not increase the capacity of forests a carbon sinks. "In fact, young forests rather than old-growth forests are very often conspicuous sources of CO2 because the creation of new forests (whether naturally or by humans) frequently follows disturbance to soil and the previous vegetation, resulting in a decomposition rate of coarse woody debris, litter and

soil organic matter that exceeds the NPP (net primary production) of the regrowth." (Sebastiaan Luyssaert, E. et. al. 2008)

Forests affect climate and weather, in four primary ways: they lower temperatures, increase the moisture comment of air and soil, and absorb carbon dioxide from the atmosphere and they store sequester carbon. Each part of the forest contributes to climate control, from the leaves, stems, trunks and roots of trees and vegetation, to down woody debris, leaf litter and soils. Leaves cool the air through a process called evapotranspiration. Evapotranspiration is the combination of two simultaneous processes: evaporation and transpiration, both of which release moisture into the air. During evaporation, water is converted from liquid to vapor and evaporates from soil, lakes, rivers and even pavement. During transpiration, water that was drawn up through the soil by the roots evaporates from the leaves. It may seem like an invisible process to our eyes, but a large oak tree is capable of transpiring 40,000 gallons of water into the atmosphere during one year. (USGS) Leaves also filter particles from the air, including dust, ozone, carbon monoxide and other air pollutants. Through the process of photosynthesis, trees remove carbon dioxide and release oxygen into our air. Trees store the carbon dioxide, called carbon sequestration, and -- depending on the size of the tree -- can hold between 35 to 800 pounds of carbon dioxide each year. (USEPA, 2007)

There are numerous studies that show that mature and old-growth stands act as carbon sinks. Their benefits in carbon sequestration are more complex than indexing the rate of vegetative growth. Undisturbed forest stands sequester carbon not only in the trunks of trees, but in the understory and in soils, where fungi and microbes promote an active role in storing carbon and nitrogen. As was reported recently in *Nature*, old-growth forests accumulate carbon for centuries and contain large quantities of it. (Sebastiaan Luyssaert, E. et. al. 2008)

Contrary to the hypothesis that old trees are ineffective at carbon sequestration, the research shows that young forests, rather than old-growth forests, are very often conspicuous sources of CO_2 because the creation of new forests (whether naturally or by humans) frequently follows disturbance to soil and the previous vegetation, resulting in a decomposition rate of coarse woody debris, litter and soil organic matter. (ibid. 2008) Indeed, there is research emerging that old growth stands are carbon-rich forests (Pichancourt, 2014) effective at accumulating carbon in their soils (Shuguang, et. al., 2006) and that the rate of tree carbon accumulation increases continuously with tree size. (Stephenson, et al., 2014)

Federal lands have a unique potential to be effective carbon sinks due to the ability to minimize anthropogenic changes to the landscape that would otherwise release carbon and/or decrease carbon carrying capacity (logging, roads, species conversion, etc). For example, a comparative study between the lands in Ft. Benning, Georgia and the surrounding region demonstrates how lands under a stable owner (the military) with stable management (little or no logging in much of its holdings) are much more effective at sequestering carbon than the mix of private and state lands surrounding it. (Shuquingzau, Shuguangliu, et. al. 2010)

It turns out that, forests hundreds of years old can continue to actively absorb carbon, holding great quantities in storage. Resprouting clear-cuts and forest openings on the other hand, often emit carbon for years, despite the rapid growth rate of young trees. This is because decomposer microbes in the forest soil, which release CO2 as they break down dead branches and roots, work more quickly after a stand is logged. On the dry eastern face of the Cascades, for example, where trees grow slowly, a replanted clear-cut gives off more CO2 than it absorbs for as much as 20 years.

Every decision subject to NEPA should recognize climate change as a reasonably foreseeable event and should carefully consider and analyze the issue of climate change from two perspectives: **first,** the cumulative effects of the proposed action plus the anticipated effects of climate change on the resources directly and indirectly affected the proposal, and **second** the extent to which the proposed action will tend to mitigate or exacerbate climate change by directly or indirectly emitting or sequestering greenhouse gases from both fossil deposits and the biosphere. This will help meet the objectives of NEPA by leading to more informed decision- making at all levels of government.

See Petition Requesting That The Council On Environmental Quality Amend Its Regulations To Clarify That Climate Change Analyses Be Included In Environmental Review Documents. The International Center for Technology Assessment, NRDC, Sierra Club. February 28, 2008. Provided
http://www.airportattorneys.com/files/Intl%20Ctr%20Petition%20on%20CEQA.pdf
(Accessed 2/13/2014)

The NEPA analysis should start with an accurate and up-to-date inventory of carbon storage and carbon flows on federal land. This is required by both the National Forest Management Act (16 USC §1601(a)(1)&(2)) and the Federal Land Policy & Management Act (43 USC §1711(A)).

The NEPA analysis should disclose and consider that logging has several adverse consequences on GHG pools and flows:

1. Logging kills growing trees that would otherwise continue to capture and sequester carbon through photosynthesis. Killing the trees also stops them from pump carbon into the soil where a lot of carbon is stored. Forests deliver massive amounts of carbon into the soil as photosynthate that supports a vast below-ground ecosystem and as course woody debris. Logging kills the food supply for the below- ground ecosystem. “Contrary to commonly accepted patterns of biomass stabilization or decline, biomass was still increasing in stands over 300 years old in the Coast Range, the Sierra Nevada and the West Cascades, and in stands over 600 years old in the Klamath Mountains.” (Hudiburg, 2009. Provided.)

2. Logging “captures mortality” and truncates the “essential link between live and dead biomass pools” which interferes with the process of accumulation of dead wood biomass. As forest stands grow older, dead biomass pools increase unless timber harvest removes live trees. Aggressive management reduces tree mortality which is input into dead

biomass carbon pools; the result is the extremely low level of dead biomass, especially coarse woody debris in intensively managed forests.

3. Avoided logging of mature & old forest = avoided emissions of GHG. Logging accelerates the rate of decomposition of wood through several mechanisms.

a.) Logging raises soil temperature thereby increasing the rate of decay of woody debris and the rate of decay of the below ground ecosystem, which converts carbon to gaseous form (CO2).
b.) Logging decreases the average piece size, and increases the surface area of the wood, thereby increasing the area exposed to biological decomposition.
c.) Logging debris is often burned, or as hog fuel, biomass, etc.

4. Some argue that logging is helpful because carbon is sequestered in wood products, but this is inaccurate:

a. Of all the carbon that is killed and/or exposed to accelerated decay in a logging operation only a small fraction ends up as durable goods and buildings -- most ends up as slash, sawdust, waste/trim, hog fuel, and non- durable goods like paper. Some say that converting forest to wood products "delays" emissions, but in fact logging accelerates emissions because they are the result of a process that kills trees that would continue to actively sequester carbon if not logged, and logging involves tremendous waste in the logging process, milling process, construction/manufacturing process.

b. Much of the wood products which can reasonably be considered "durable" are in fact less durable than leaving the carbon stored safely inside a mature tree that might live to be hundreds of years old. Most of our wood products are disposable. It turns out that well-conserved forests on average store carbon more securely than our “throw-away” culture and economy does.

c. “*... carbon is lost into the atmosphere during and after harvest as slash left on-site quickly decays. (See figures 14 and 15.) There are also losses of carbon that occur during the creation of forest products. These losses to decay and wood products make carbon sequestration slower when harvesting is allowed. The young timberlands that replace older harvested lands grow quickly, but hold less in total carbon stores than their older counterparts; the net sequestration from forest products adds to total carbon stores, but does not come close to the vast amounts of carbon stored in non- harvested older timberlands. This finding differs from other papers that have shown that the highest carbon mitigation can be reached when high productivity lands are used exclusively for wood products creation (Marland and Marland, 1992). The wood products considered in these studies were either long lasting or used for fuel purposes. Allowing harvested timber to be allocated to all types of wood products increases carbon emissions and results in no harvest regimes sequestering more carbon.”* Shanks. 2008. Provided.

d. BLM's WOPR FEIS shows that decades of converting old growth forests to plantations has reduced current forest carbon stores on BLM lands in western Oregon by 149 million tons, while some of that wood was converted into wood products, only 11 million tons of that carbon remains stored in wood products today, so logging our public forests to make wood products results in approximately 13 times more carbon emissions than carbon storage. This is pieced together from WOPR FEIS Figures 3-17 (p 3-221) and Figure 3-18 (p 3-224). Further logging of mature forests will exacerbate this outcome.

e. Review and consider (Ingerson, A. 2009. Provided) (Key Points - 1. When wood is removed from the forest, most of it is lost during processing. The amount lost varies tremendously by region, tree species and size, and local infrastructure.

f. The majority of long-term off-site wood carbon storage occurs in landfills, where decomposing wood gives off significant amounts of methane, a gas with high global warming potential. 3. In addition to wood processing losses, fossil fuels are required to turn raw logs into finished products and ship them from forest to mill to construction site to landfill. 4. Once wood losses and fossil emissions are accounted for, the process of harvesting wood and turning it into products may release more greenhouse gases than the emissions saved by storing carbon in products and landfills. ... 9. Properly managed, wood can be a renewable source of building materials and fuels, but solving the climate crisis will require reducing the use of all materials and energy.")

g. Even a suppressed tree stores carbon better than a dead tree after it is logged, limbed, bucked, debarked, milled, planed, processed, trimmed, manufactured, used, and then discarded.

The agency should fully mitigate for the effects of increased warming due to carbon emissions that result from logging for the full time period that the logging alternative stores less carbon than the no-logging alternative.

As stands develop from young to mature to old they recruit large amounts of material from the live tree pool to the dead wood pool, which continues to accumulate large amounts of carbon for centuries. Logging, even thinning, captures that mortality and can dramatically affect the accumulation of carbon in the dead wood pool.

Conclusion - Over the last several decades, forest managers in North America have used concepts of historical range of variability, natural range of variability, and ecological sustainability to set goals and inform management decisions. An underlying premise in these approaches is that by maintaining forest conditions within the range of presettlement conditions, managers are most likely to sustainably maintain forests into the future. We argue that although we have important lessons to learn from the past, we cannot rely on past forest conditions to provide us with adequate targets for current and future management. This reality must be considered in policy, planning, and management.

Although general principles will emerge, the best preparation is for managers and planners to remain informed both about emerging climate science as well as land- use changes in their region, and to use that knowledge to shape effective local solutions. A goal of this paper is to engage dialogue on this issue." (Millar 2007. Provided)

MISTLETOE IS PART OF A HEALTHY FOREST

The benefits of dwarf mistletoe as wildlife habitat and a food source are well known. Not only does the presence of mistletoe contribute to stand diversity through the creation of gaps, structural irregularity and contribute to the accumulation of snags and down wood, it also serves as habitat for a variety of mammals, birds and arthropods. In particular, large Witch's brooms serve as nest platforms for spotted owls and raptors.

Mistletoe provides many stand benefits (diversity, gaps, irregularity, snags and down wood). The purpose and need for this project might be better met by retaining, rather than removing, mistletoe infected trees.

Please *consider* implementing projects such that mistletoe habitat is retained. Mistletoe provides significant benefits to forest ecosystems. As evidenced by the June 2011 agreement between the Murphy Company, KS Wild and the BLM, mistletoe trees can be retained while small-diameter thinning objectives are met. Such an alternative is reasonable and should be analyzed.

The forthcoming NEPA should answer the following questions: How many mistletoe trees will be logged? Where are they located? What is the environmental baseline? How many wildlife species will be impacted by mistletoe removal?

Mistletoe does not inhibit forest health. Mistletoe does reduce the growth rate of the host trees, but that is only a forest health problem if one believes that fiber production is the only measure of forest health. Mistletoe creates complex habitat structures such as brooms and snags and is a natural and vital part of the ecosystem.

We urge the KNF to manage for a complex forest and a wide range of forest values. Ironically, logging practices often contribute to the spread of dwarf mistletoe. When soils are disturbed and ground cover is removed during logging operations, stand densities increase because seedlings readily germinate and grow on bare mineral soil. Such disturbances are particularly prevalent when heavy machinery is used to remove trees. Logging may increase mistletoe in the remnant stand, rather than decrease it. Many mistletoe seeds that infect host trees do not readily produce aerial shoots; these are known as "latent infections" (Knutson and Tinnin 1980 Provided). After thinning, 90 percent of all latent infections will appear within five years (Shea 1964).

Mistletoe seed production will increase after the proposed entry with improved nutrition of the infected leave trees that do not now display symptoms of infection. More open stands will promote regeneration, and the new trees can become infected by the mistletoe seeds dropped from infected leave trees. Moreover, increased mortality can occur in the

remaining overstory trees; some heavily infected trees are not able to adjust to release from competition (Knutson and Tinnin 1980).

"Mistletoes (Loranthaceae) provide structural and nutritional resources within canopies, and their pervasive influence on diversity led to their designation as keystone resources. Having confirmed the status of mistletoe as a keystone resource, we suggest that nutrient enrichment via litter-fall is the main mechanism promoting species richness, driving small-scale heterogeneity in productivity and food availability for woodland animals. Watson 2012. Provided

FIRE

Miller et al. (2012) analyzing all fires over 400 hectares 1987-2008 in the California Klamath region, found low proportions of high-severity fire (generally 5-13%) in long-unburned forests, and the proportion of high-severity fire effects in long-unburned forests was either the same as, or *lower than*, the high-severity fire proportion in more recently burned forests (see Table 3 of Miller et al. 2012. Provided).

The fear of fire is often used to justify logging. Please acknowledge that fire exclusion does not automatically equate to high severity fire. Most often the Forest relies on the notion that it does, but this assumption is not based in scientific proof.

ROADS AND LANDINGS

Of all the cultural data layers obtained, roads serve as the most useful indicator of human use and disturbance of natural systems both directly and indirectly. Roads directly impact natural ecosystems by: (1) being a significant factor in landscape conversion and fragmentation…….. Srittholt 1999 pg.17

This report goes on to list multiple other direct and indirect impacts from roads. Please address all of these negative impacts form roads. Temporary roads are not temporary and will remain on the landscape for decades as seen on the Klamath National Forest and within the Crawford project area. Please also analyze and disclose the monetary and ecological cost of roads.

In the Forest, roads are the leading source of management-related sediment inputs, predominantly associated with mass wasting features such as shallow debris slides and debris torrents. The majority of road-related erosion and sediment delivery are associated with large storm events that trigger culvert failures, stream diversions, and mass wasting such as debris slides and smaller slumps within the roadbed. With declining road maintenance funding, the risk of road failures and elevated sediment delivery increases, particularly in the event of future large storms. The DEIS must analyze and disclose the effects of logging activities, especially concerning large storm events.

Roads have the potential to substantially affect water quality and watershed condition through accelerating erosion and sedimentation (i.e. gullies, landslides), by altering channel widths and depths, and by changing the runoff characteristics of watersheds.

These changes result in detrimental impacts to fish habitat, which in turn impact the viability of fisheries.

NON-NATIVE INVASIVE SPECIES

Invasive Non-Native Weeds are one of the four primary threats to our nation's forests and grasslands. In the USDA Forest Service Strategic Plan for fiscal years 2007-2012, one of the objectives under the primary goal is to, "restore, sustain and enhance the nation's forests and grasslands" and to "reduce adverse impacts from invasive species." One of the requirements contained in the FSM 2900 is for a determination of "the risk of introducing, establishing or spreading invasive species associated with any proposed action, as an integral component of project planning and analysis, and where necessary provide for alternatives or mitigation measures to **reduce or eliminate** that risk prior to project approval."

Please address how and ground based logging and road and landing construction will likely increase non- native plant species as research has documented.

We found that fuel breaks have the potential to promote the establishment and spread of nonnative plants. However, fuel breaks with more canopy and ground cover may be less likely to be invaded. Varying construction methods to retain more litter cover, minimize the exposure of bare ground, and retain some canopy cover might reduce nonnative germination and establishment on fuel breaks. The 24 fuel breaks we sampled had unique histories, including various dates of construction, different construction and maintenance regimes, varying fire histories, and different land use histories. Despite this variation, we found that 19 of the 24 sites had significantly higher relative nonnative cover within fuel breaks than in adjacent wildland areas. Merriam 2007. Provided.

Non-Native Invasive Species (NNIS) of plants are a severe threat to the project area resulting in loss of biodiversity, increased exposure of native species to disease and degradation of the ecosystem. Early recognition and removal of NNIS is extremely important to maintain intact ecosystems.

NATIVE BOTANICAL SPECIES

We are concerned with rare and Sensitive native plant species. Please analyze and disclose the effects of logging, landing and road construction on these botanical species.

PORT ORFORD CEDAR (POC)

We are extremely concerned with the risk of spreading POC root rot disease. Please analyze and disclose the effects of logging activities and disclose location of POC in and around the project area. We believe that the spread of POC root rot disease may be a significant issue.

CULTURAL RESOURCES

The DEIS must analyze and disclose the effects of logging activities on cultural resources

MARIJUANA AGRICULTURE

The forthcoming NEPA document must disclose the potential cumulative impacts of the proposed action in combination with other impacts in the area, including the impacts of marijuana plantations.

As various officials of the Klamath National Forest, and Forest Service Law Enforcement Officers from Region 5 have noted at length in various forums around the region over the last several years, the rising incidence of large commercial marijuana plantations on the Klamath national forest has raised serious concerns about potential environmental impacts. Such impacts would include at least water pollution (reports have included claims that fertilizers have been mixed directly in creeks); loss of stream flow from pumping to plantations (which could further reduce critical cold water habitat, as well as exacerbating pollution problems); dumping of trash, pipe, fertilizers and pesticides; and impacts to wildlife populations from habitat disruption, trapping, and shooting.

In order to understand the potential impacts of the proposed timber sale in this context, the forthcoming NEPA document should analyze what the Forest Service knows about large marijuana plantations in the area of the proposed action, including approximate locations, area, age, the incidence of known or suspected pollution problems, and the extent and progress of the agency's program for remediation of these impacts.

SPECIFIC TO REGION 5 ECOLOGICAL RESTORATION IMPLEMENTATION PLAN

Please address how the Crawford project expands and improves tribal consultation.

We will expand and improve our consultation with tribal governments to utilize their traditional knowledge of stewardship and caring for the land. Emphasis will be placed on collaboration with stakeholders, communities, local government, volunteers, and citizens to facilitate dialogue and to decrease conflict in planning and implementing Ecological Restoration efforts. ERIP pg. 2

Seek to learn and to incorporate TEK into all aspects of the Implementation Plan. Building • successful tribal relations will play a significant role in the collection, incorporation and use of TEK. ERIP pg. 7

Please address how the Crawford project is grounded in concern for biodiversity and ecological processes.

Ensure vegetation and fire management efforts are grounded in concern for biodiversity and ecological process both before and after disturbances like fire. ERIP pg. 3

Please do,

Work with partners to increase restoration actions that will improve habitat connectivity. ERIP pg.3

With a focus on Ecological Restoration, the following ecosystem services and community economic benefits will be enhanced:

- *• Delivery of clean water and an improved flow regime that benefits people, fish, and wildlife*
- *• Fish, wildlife, and plant habitat, for both common and rare species*
- *• Maintenance of biodiversity*
- *• Forest resilience in the face of climate change and changing disturbance processes*
- *• Carbon sequestration*
- *• Air quality*
- *• Rural economic health*
- *• Outdoor recreation and scenic beauty*
- *• Landscapes for health and renewal*
- *• Wood products*
- *• Wood biomass for energy*
- *• Forage for wildlife and livestock*
- *• Green economic activity*

As we work toward the goals outlined above, we will learn and adjust as we go. Over time there will be new science, new ideas, and new collaborations that will improve our understanding. With this new understanding, we will make course corrections in policy and practice and move even more efficiently toward our overall goal of resilient forests and wildlands. ERIP pg. 3-4

Please address how the Crawford Project is utilizing Region 5 Ecological Restoration Strategies.

This chapter identifies the strategies that the Region and National Forests will utilize to help advance ecological restoration work. Our commitment to increasing the pace and scale is grounded in the acknowledgement that Ecological Restoration is a long-term commitment and the central driver of wildland and forest stewardship across all program areas and activities. ERIP pg. 5

Ongoing work to protect and maintain existing healthy forests, ecosystems and biodiversity will still be accomplished within existing programs. Each Regional and forest function has been challenged to look for ways within existing programs of work to keep their focus and priority on both maintenance of healthy ecosystems and restoration of landscapes that need repair or are at risk. ERIP pg. 5

The Regional Forester's comprehensive approach to restoration embraces ecological, economic and social outcomes. This triple-bottom line approach to resource management means that economic, ecological, and social objectives are advanced together without trading off one for another. For example, managing for timber production or increasing local employment or some other aspect of community well-being will not be done to the detriment of environmental objectives, such as maintaining healthy populations of spotted owls or fishers. ERIP pg. 5

Utilize a collaborative, "all lands" approach to planning; utilize landscape scale planning, focusing on logical ecological/social units rather than administrative boundaries or ownership.

- ***Actively participate with collaboratives that take an "all lands" approach to restoration; work with neighbors and communities to strategically assess, plan and seek funding to complete large scale restoration work. The goal is that with time this will become a common way for forests to accomplish restoration goals.*

Strengthen and expand partnerships with key groups, organizations, entities and businesses, both locally and regionally, to enhance our ability to achieve work through partner and beneficiary investment. ERIP pg.7

Continue to foster partnerships with research, academia and nonprofit public interest groups to expand our scientific knowledge base; integrate science into larger landscape project design. ERIP pg.9

Continue to focus on key ecological questions, including species of concern, essential habitats, water, and climate change effects.

Wilderness areas and Wild and Scenic Rivers provide long-term protection for upland and riparian vegetation, helping to mitigate the production of greenhouse gases through carbon sequestration. Maintaining and protecting these undisturbed landscapes provides clean air, clean water, and biodiversity within habitats that support wildlife and fisheries. ERIP pg. 17

<u>COORDINATING WITH CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE</u>

There is a clear need and direction from all wildlife and land management agencies to coordinate in order to assure the viability of species in California. The 2005 State Wildlife Action Plan is currently being updated.

Because Region 5 manages National Forests in the entire state of California, it would be prudent to closely coordinate conservation and ecological restoration efforts with the California Department of Fish and Wildlife (CAFW). Numerous species populations have been declining for decades. The CAFW is currently revising the State Wildlife Action Plan (SWAP 2005. Provided). The following substantive excerpts from that plan:

Recommended Statewide Conservation Actions (xxii-xxiii)

The state should develop policies and incentives to facilitate better integration of wildlife conservation considerations into local and regional planning and land-use decision-making.

The state should develop policies and incentives to better integrate wildlife conservation into state and regional transportation planning. Wildlife considerations need to be incorporated early in the transportation planning process.

State and federal agencies should work with cities and counties to secure sensitive habitats and key habitat linkages.

Federal, state, and local agencies should provide greater resources and coordinate efforts to control existing occurrences of invasive species and to prevent new introductions.

Federal, state, and local agencies and nongovernmental conservation organizations, working with private landowners and public land managers, should expand efforts to restore and conserve riparian communities.

Federal, state, and local agencies and nongovernmental organizations, working with private landowners, should expand efforts to implement agricultural and rangeland management practices that are compatible with wildlife and habitat conservation.

In their conservation planning and ecosystem restoration work, state and federal wildlife agencies and land managers should consider the most current projections regarding the effects of global warming.

Both state and federal governments should give greater priority to wildlife and natural resources conservation education.

The state should strengthen its capacity to implement conservation actions and to assist local agencies and landowners with planning and implementation of wildlife and habitat restoration and conservation efforts.

North Coast–Klamath Region

Public forestlands should be managed to maintain healthy ecosystems and wildlife diversity. State and federal forest and wildlife managers should work cooperatively to develop a vision for future forest conditions.

On public lands, post-fire and post-harvest treatments and forest management should be designed to achieve the principles listed above.

Federal and state agencies should work to understand the natural fire regimes of different ecosystems and how the ecological role of wildfire can be replicated with prescribed fire and other forest management practices.

Federal, state, and local agencies and nongovernmental organizations should work with regional landowners to develop and implement agricultural and rangeland management practices that are compatible with wildlife and habitat conservation.

Federal, state, and local agencies should provide greater resources and coordinate efforts to eradicate or control existing occurrences of invasive species and to prevent new introductions.

Federal, state, and local agencies, nongovernmental conservation organizations, and private landowners should protect and restore underprotected and sensitive habitat types such as riparian forests and coastal dunes.
Wildlife at Risk (p. 20-21)

Among wildlife species, those with limited distributions and those that are restricted to particular habitat types face formidable challenges if the habitats or resources upon which they depend are lost or degraded. Wide-ranging and migratory species also face unique threats because they are vulnerable to habitat fragmentation and because it can be difficult for conservation managers to secure the protection of widely separated habitat areas.

According to conservation status rankings developed by Natural Heritage programs across the United States, 23 percent of at-risk amphibian species in the United States are found in California, 29 percent of at-risk reptiles, 19 percent of at-risk birds, 41 percent of at-risk mammals, and 10 percent of at-risk freshwater fishes. In terms of overall biological diversity (including both plants and animals), California ranks second among the states for the percent of its species that are at risk (Stein et al. 2000).

More than half of California's vertebrate wildlife (a total of 455 species) are at risk and listed on the Department of Fish and Game's Special Animals List.

Recommended Statewide Conservation Actions (p. 31)

- *State and federal wildlife agencies, working with nongovernmental organizations, should inventory and evaluate sensitive wildlife habitat and key habitat linkage areas.*
- *Public land managers should protect wildlife habitat linkages on public lands.*

- *Lead planning agencies should incorporate habitat linkages and other identified key habitats into conservation plans. Regional conservation plans should include adaptive management provisions to accommodate protecting important wildlife linkages as they are identified.*

- *The state should partner with federal and local land managers, land trusts, and conservancies to prioritize and secure, through purchase, swaps, or easements, important habitat linkages and other priority sites that are not now protected.*

Conservation Actions to Restore and Conserve Wildlife (p. 264)

Public forest lands should be managed to maintain healthy ecosystems and wildlife diversity. State and federal forest and wildlife managers should work cooperatively to develop a vision for future forest conditions.

Management of national forests and other public forestry lands should incorporate the following principles:

- *Restoration and maintenance of habitat diversity across the landscape.*
- *Restoration of vegetation communities historically present within forest landscapes.*
- *Restoration and maintenance of structural complexity in forest stands, including dead trees, snags, and fallen logs.*
- *Restoration and maintenance of connectivity in the forest landscape.*
- *Retention of remaining mature and late-successional forests.*
- *Restoration and maintenance of the integrity of riparian and aquatic ecosystems.*

<u>WORKING TOGETHER</u>

The opportunity for conservation or restoration of more natural conditions will depend on our ability to collaborate across disciplines to recognize what those conditions were, where we can hope to do it, and which areas are likely to provide the greatest ecological value. Reiman et al. 2006 pg. 93 Provided

Vision: Forest Service Pacific Southwest Region employees cultivate relationships with outside organizations and engage in partnerships as second nature in getting work done to accomplish our mission. The Region takes advantage of all useful authorities and promotes and rewards collaboration with external people and organizations at every turn. This results in better services for the American public and the best possible stewardship of ecosystems on public and private lands. ERIP

True ecological restoration requires the maintenance of ecological processes, native species composition, and forest structure at both stand and landscape scales. Because forests are highly variable over space and time, few universal principles exist for integrating insights from ecology and conservation biology into fire management policies. Nevertheless, one fundamental principle is that managed forests should not only support the desired fire regime but also viable populations of native species in functional

networks of habitat (Hessberg et al. 2005). A common-sense conservation goal is to achieve forests that are low maintenance and require minimal repeated treatment. With time, in a landscape of sufficient size, the right end of the restoration continuum (Figure 4) could be reached, where natural fire maintains the system in the desired state. Indeed, wildland fire use is the cheapest and most ecologically appropriate policy for many forests. We envision a future where fire is seen by land managers and the public as the key to healthy forests, but where each forest and each patch of the forest mosaic is recognized for its individuality and managed accordingly. Above all, a guiding principle of forest management should be a precautionary approach that avoids ecological harm.
Noss 2006 Provided

ALTERNATIVES

Please analyze, not just consider, a wide range of alternatives that would:

1) Retain the untouched roadless values of the Siskiyou 1 Roadless Area
2) Protect and restore late-seral habitat
3) Retain all large fire resistant trees
4) Would not include new landing and road construction or reconstruction.
5) Would not include tractor logging, road and landing construction in natural native stands.

CONCLUSION

Please change the trajectory of projects, including the Crawford Project, on the Klamath National Forest. As we are involved in the Western Klamath Restoration Partnership it would be worthwhile for multiple reasons to honestly restore this vital wildlife connectivity corridor rather than continue to hammer away at Threatened species and the hundreds of *at-risk* wildlife species in California. Perhaps the Partnership could adopt this area and work on our *zones of agreement*. The west side of the Klamath National Forest is of ecological global significance and is well worth protecting.

We ask again to please consider alternative funding sources so as to alleviate the need for tractor logging and road building in the untouched native stands in the Siskiyou 1 Roadless Area.

Sincerely,

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