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Patricia Grantham
Forest Supervisor
Klamath National Forest
1711 South Main St.
Yreka, CA 96097
Patricia.grantham@usda.gov

Danika Carlson
Environmental Coordinator
Salmon/Scott Ranger District
11263 N. Highway 3
Fort Jones, CA 96032
Danika.carlson@usda.gov

Sent via email and USPS with a compact disk including referenced materials

RE: South Fork Project Scoping

Dear Supervisor Grantham and South Fork planners,

Please accept these South Fork Project scoping comments on behalf of the Klamath Forest Alliance, EPIC- the Environmental Protection Information Center and KS Wild the Klamath Siskiyou Wildlands Center. Our organizations work in the public interest and represent over 13,000 people who deeply value the intact mature forests and outstandingly remarkable rivers on our public lands, particularly the Salmon River watershed.

The South Fork project (project) is located on the East Fork of the South Fork Salmon River Headwaters (East Fork), upriver from the town of Cecilville to Carter Meadows, and within Fish Lake Creek, Trail Creek, Six Mile Creek, Gould Gulch, Shadow Creek, Gooey Gulch, Taylor Creek and French Creek 7th field watersheds. The purpose and need of the project is to:

§ Provide safe ingress and egress for public and firefighting resources.

§ Improve and promote the health and resiliency of forested lands to insects, disease and the potential effects of climate change.

§ Reduce risks to forest and private lands from negative effects of large-scale wildfire.

§ Restore degraded meadow structure due to conifer encroachment and absence of fire.

§ Reduce the risk of overhead hazard impacts to the public in recreation areas and along forest roads.

Treatment is proposed on about 3,320 acres within the 7,690-acre project boundary, including treatments in 2,175 acres of Late Successional Reserves, 1,313 acres in Riparian Reserves, 260 acres Recreational River, 191 acres Partial Retention Visual Quality, 153 acres of Wilderness and 133 acres in the Retention Visual Quality land allocation.

This project proposes the following three types of treatments: (1) **2,455 acres** variable density commercial thinning, this includes 1,105 of Ground-Based, 310 acres Skyline, 575 acres Helicopter; (2) **320 acres** fuel break construction around private property; and (3) **1,720 acres** prescribed fire. The proposed action includes access along 1.3 miles of temporary roads on existing roadbeds and less than one mile of new temporary road. **Eleven** helicopter landings (eight log landings and three service landings for refueling and maintenance) and **fifty-five** landings to accommodate ground based logging.

We are extremely concerned with the amount of commercial logging and landing construction in the Carter Meadows and Eddy Gulch Late Successional Reserves (LSR) and activity within Riparian Reserves. The ecological harm from the project, as proposed, would be contrary to LSR direction and attainment of the Aquatic Conservation Strategy. The cumulative effects on wildlife and water quality in combination with the Bear Country, Eddy LSR, Petersburg Pines, Caribou Salvage and others implies that this project necessitates the completion of an environmental impact statement (EIS).

We support the purpose and need to: provide safe ingress and egress on strategic and priority roads for the public, treat heavy vegetation loads directly adjacent to public property and to reduce hazard trees in recreation areas and priority roadsides. However, the majority of the proposed action in this LSR includes logging mature forests in a well-loved area that is providing crucial connectivity to multiple old-growth dependant species. The Salmon River is 303(d) listed under the Clean Water Act and a Tier -1 Key watershed deemed critical for the recovery of wild salmon.

Please note that NEPA mandates a particular process but not necessarily a particular result. Inland Empire Public Lands Council v. USFS, 88 F.3d 754, 758 (9th Cir. 1996). This process must proceed without undue bias from the action agency and ultimate decision maker. The CEQ regulations warn that a NEPA document may not be used to justify a decision already made. 40 CFR §1502.2(g).

CARTER MEADOWS-CORE HABITAT, PRIME CONNECTIVITY CORRIDOR AND PRIORITY MICROREFUGIA

The project area within the Carter Meadows LSR is a vital wildlife corridor, which lies directly between the Russian Wilderness to the North and the Trinity-Alps Wilderness to the South. The checkerboard ownership and private lands to the East provide little opportunity for movement and to the West lies the Salmon River watershed. Much of the land base within the watershed has been affected by past management and/or is proposed for vegetative treatment, including commercial logging and prescribed burning.

Fragmentation is the single most important factor in declining biological diversity, so preserving intact forests and natural dispersal corridors, is crucial for the survival sensitive, threatened and endangered species.

As defined in the Northwest Forest Plan Final Environmental Impact Statement, connectivity is a measure of the extent of which the landscape pattern of the late successional and old-growth ecosystem provides for biological and ecological flows that sustain late successional and old-growth associated animal and plant species across the range of the northern spotted owl. It is generally agreed that maintaining habitat linkages between populations (fisher and marten) may be important to ensure the long-term viability of isolated furbearer populations (LSRA page 37)

The July 2019 Final Report*, Habitat Connectivity for Fishers and Martens in the Klamath Basin Region of California and Oregon* prepared by the Conservation Biology Institute in partnership with the US Fish and Wildlife Service (Spencer et al 2019, Connectivity Report) was intended to assess connectivity needs for species of pre-listing conservation interest in the Klamath region. It identifies important landscape connectivity areas in the mid-Klamath Basin and southern Oregon for two forest species of conservation concern: Pacific marten (Martes caurina) and Pacific fisher (Pekania pennanti). It assesses current connectivity status and identifies where connectivity could be improved through restoration or other actions.

The maps on pages 4, 6, 35 and 37 of the Connectivity Report illustrate that the Carter Meadows portion of project area is a critical connectivity corridor and core habitat for the marten and fisher. The entire East Fork of the South Fork drainage provides connectivity and core habitat for the fisher. Page 5 states:

> Core and linkage areas are somewhat more distinct for martens than for fishers, in part because martens live and breed in higher elevation conifer forests that are more limited in the region than the lower-elevation forests preferred by fishers. Marten cores are therefore generally more discrete and widely separated than fisher cores, often with long linkages that must cross lower-elevation habitats, which are unlikely to be suitable as live-in habitat and risky for intercore movements. Managing to maintain or increase forest cover in these linkage areas may help maintain marten metapopulation function,

A population genetic study in this region would be useful for identifying which subpopulations may be genetically connected or isolated to help identify where management interventions may be most beneficial.

The project area has also been documented to provide priority areas for the protection of microrefugia, which is defined as sites with cool and moist conditions conducive to the persistence of species vulnerable to climate change. From Olson et al 2012:

> 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).

Please address how the proposed logging, road and landing construction would affect microfugia and wildlife connectivity. Better yet, we urge project planners to drop large-scale logging and landing construction in the Carter Meadows and Eddy Gulch LSR.

LATE SUCCESSIONAL RESERVE DIRECTION

Late-successional forests are those forest stages that include mature *and* old-growth species (Taylor/Carter Meadows Late Successional Reserve Assessment LSRA at page 1). The elevation, starting at the mouth of Taylor Creek, ranges from 2,800 to 7,200 feet in the Carter Meadows portion. Historically fire intervals were every 4-24 years. Fire severity was obviously higher on exposed south facing slopes and ridges. The vegetation in the Carter Meadows area is dominated by White fir with some open pine stands on south facing slopes. Historically, the true fir stands that are present in the upper elevations tend to be single storied and are denser than mixed conifer stands. These white fir stands historically had occasional epidemic levels of fir engraver beetles, which likely influenced the occurrence of stand replacing fire. Dense douglas fir and mixed conifer forest stands with continuous canopy were more dominant on the north and east facing slopes lower in the drainage and Ponderosa pine is more dominant on south slopes.

According to the map on page 10 of the LSRA it appears that a majority of the commercial units in the Carter Meadows area is within mid-late seral dense stands. The LSRA at page 11 states that, "Within the Carter Meadows portion, blocks of late successional habitat are found as stringers along stream channels. One large block runs adjacent to the East Fork of the South Fork Salmon River. Carter Meadows and the wet meadow system with open rock spires to the south is naturally providing a fire break.

Please note the Carter Meadows LSRA pages 58-59 state:

> Thinning activities will occur in young and older plantations and natural early and mid-successional stands.
>
> In any case, no trees larger than 18" dbh would be removed.
>
> The highest priority areas are those plantations and young growth stands that are currently located in the Carter Meadows portion of the LSR (particularly those that are immediately adjacent to late successional or old-growth forest stands). The Carter Meadows area is a priority area for this treatment due to the extreme deficit in late successional and old-growth forest habitat, particularly given the occurrence of two owl activity centers.

We bring your attention to the map on page 62 of the Carter Meadows LSRA that illustrates the fuels reduction and plantation and young growth stands recommended for treatment. Please follow these recommendations as directed by the Klamath National Forest Land Resource Management Plan (LRMP). The map on page 72, that includes the project area within the Eddy Gulch LSR, shows that most of the project area falls within

low priority areas for treatment, followed by medium with a very small portion of the project as a high priority.

A portion of the project area within the Eddy Gulch LSR has many of the same vegetative characteristics as the Taylor/Carter Meadows LSR. There is a multitude of mammalian, avian, amphibian and vascular plant species identified as being closely associated with late successional forest that are known or are expected to occur within the LSRs. From the map on page 29 of the Carter Meadows LSRA, which also shows the portion of the project within the Eddy Gulch LSR, it appears that many of the commercial units are within suitable habitat for the northern spotted owl. Suitable habitat includes retaining 2-5 snags per acre and 2-5 down logs per acre and the presence of deformed trees (mistletoe, heart rot et.) The LSRA also states at page 32, "In the Carter Meadows portion of the LSR, most of what little Nesting Roosting Foraging (N/R/F) habitat exists is located in the north facing section.

Please be descriptive in the forthcoming NEPA document as to the seral stage, current vegetative condition and habitat type of each unit.

TIER- 1 KEY WATERSHED, RIPARIAN RESERVES AND AQUATIC SPECIES

Some of the most productive, sensitive, and diverse sites are within Riparian Reserves. They tend to provide moist cool microclimates that are different than adjacent uplands. Riparian areas provide important habitat for fish and other aquatic life forms, as well as a variety of wildlife species, including the willow flycatcher, fisher and bald-eagle. Riparian areas have high wildlife values because of the close proximity of water and structural diversity of the vegetation. Riparian Reserves contribute to the habitat conservation for mature and late-successional forest associated species. Riparian Reserves contribute to connectivity, especially where they occur on drier, south and west-tending slopes. They provide a network of suitable habitat to include linkage in the form of dispersal habitat.

Please be detailed in explaining the current condition, seral stage and exactly what treatments are proposed in riparian areas and where they are located. The forthcoming NEPA document must describe how this and other projects affect wildlife connectivity in RR's. The cumulative affects of this should be considered district wide, not only in terms of water quality but also in terms of habitat connectivity and effects to aquatic species. We encourage the Forest Service to consider manual fuels reduction only in riparian areas.

We are opposed to any proposed commercial logging in riparian reserve forests, unless absolutely needed to attain Aquatic Conservation Strategy objectives. The negative impact from ground-based or cable yarding are often significant and long-term. Riparian Reserves no treatment zones must be large enough account for riparian associated species. Please see this important research by Olson et al 2007:

> Stream–riparian areas represent a nexus of biodiversity, with disproportionate

> numbers of species tied to and interacting within this key habitat. New research in Pacific Northwest headwater forests, especially the characterization of microclimates and amphibian distributions, is expanding our perspective of riparian zones, and suggests the need for alternative designs to manage stream–riparian zones and their adjacent uplands. High biodiversity in riparian areas can be attributed to cool moist conditions, high productivity and complex habitat. All 47 northwestern amphibian species have stream–riparian associations, with a third being obligate forms to general stream–riparian areas, and a quarter with life histories reliant on headwater landscapes in particular. Recent recognition that stream-breeding amphibians can disperse hundreds of meters into uplands implies that connectivity among neighboring drainages may be important to their population structures and dynamics. Microclimate studies substantiate a ‘‘stream effect’’ of cool moist conditions permeating upslope into warmer, drier forests. We review forest management approaches relative to headwater riparian areas in the U.S. Pacific Northwest, and we propose scenarios designed to retain all habitats used by amphibians with complex life histories. These include a mix of riparian and upslope management approaches to address the breeding, foraging, overwintering, and dispersal functions of these animals. We speculate that the stream microclimate effect can partly counterbalance edge effects imposed by upslope forest disturbances, hence appropriately sized and managed riparian buffers can protect suitable microclimates at streams and within riparian forests.

Karr et al. 2004:

> Logging, landings, and roads in riparian zones degrade aquatic environments by lessening the amount of large wood in streams, elevating water temperature, altering near-stream hydrology, and increasing sedimentation. Roadless areas comprise some of the least disturbed living systems and are therefore especially important to the restoration of watersheds and freshwater systems. Consequently, logging activities in these areas undermine the conservation and restoration of aquatic ecosystems (FEMAT 1993, Henjum et al. 1994) even as they increase the risk of extirpation for already imperiled, fragmented, and sensitive populations.
>
> Roads and landings cause enduring damage to soils and streams, help spread noxious weeds, and hinder revegetation. Roads are a primary cause of reduced water quality and of contractions in the distribution and number of native salmonids on public lands.

Please address the multiple impacts from logging in Riparian Reserves and the general downfall of logging to reduce fire risk in Frissell et al 2014, Conservation Of Aquatic And Fishery Resources In The Pacific Northwest: Implications of New Science for the Aquatic Conservation Strategy of the Northwest Forest Plan:

> Many thinning projects involve road and landing construction and reconstruction, as well as elevated haul and other use of existing roads, all of which significantly contribute to watershed and aquatic degradation. Even if constructed roads and

landings are deemed "temporary," their consequent impacts to watersheds and water bodies are long lasting or permanent. The hydrological and ecological disruptions of road systems and their use (Jones et al. 2000, Trombulak and Frissell 2000, Gucinski et al. 2001, Black et al. 2013), exacerbated by other effects of vehicle traffic, will likely outweigh any presumed restorative benefit to streams and wetlands accruing from thinning and fuels reduction.

Substantial questions remain about the putative ecological benefits of thinning and fuels reduction. This is critical because agency proponents commonly argue that the desired ecological benefits outweigh the adverse environmental effects of logging and fuels treatments. Dispute among federal agencies about claimed ecological benefits of thinning in moister, Douglas-fir-dominated forest types (widespread in the Pacific Northwest) led to an interagency scientific review in 2012-2013 (Spies et al. 2013). That panel concluded that increased tree growth might be better obtained from thinning very young, high-density stands--which very seldom produces commercially saleable logs. They further concluded that thinning produces unusually low-stem-density forests and causes long–term depletion of snag and wood recruitment that is likely detrimental in most Riparian Reserves (Spies et al. 2013, and see Pollock et al. 2012, Pollock and Beechie 2013). Further depletion of wood recruitment in headwater streams can adversely affect the behavior of debris flows in Pacific Northwest watersheds in ways that further reduce residual wood debris and its important functions over extensive portions of streams and rivers (May and Gresswell 2002), where present-day wood abundance is decimated compared to historical conditions (Sedell et al. 1988, Pollock and Beechie 2014). Finally, recent reviews also raise compelling, unanswered questions about the effectiveness of thinning forests for attempted control of insect outbreaks (Black et al. 2013, Six et al. 2014).

The effect of thinning on fire behavior and effects within riparian areas has been little studied. For western North American forests in uplands the literature is replete with ambiguous and conflicting results regarding the effects of thinning and other mechanical fuels treatments on fire severity, rate of spread, and recurrence. Moreover, the probability of a fire burning through a treated stand within the limited time window of potential effectiveness of a fuels treatment has been shown to be very small (Lydersen et al. 2014, Rhodes and Baker 2008). Any presumed benefit is even less persistent in Riparian Reserve areas where woody vegetation regrows rapidly after treatment, and where in moister forest types fire tends to recur with lower frequency. Equally important, we question whether managers should be striving to reduce fire severity in riparian areas as a rule, considering that high-severity fire plays a natural and historical role in shaping riparian and stream ecosystems (Gresswell 1999, Minshall 2003, Benda et al. 2003, Malison and Baxter 2010). Other natural forest disturbances, including windthrow, insect outbreaks, and landslides on forested slopes, appear to play a similarly important role in generating pulses of wood debris recruitment to streams, establishing a long-lasting source of ecological and habitat complexity. Considering the difficult-to-justify costs and recognized inherent risks of adverse

> impact associated with such operations in sensitive areas, balanced against the uncertainty in intended benefits, we conclude the following: Thinning and fuels reduction by means of mechanized equipment or for commercial log removal purposes should be generally prohibited in Riparian Reserves and Key Watersheds. Any thinning or fuels treatment that does occur as a restorative treatment in Riparian Reserves (e.g., to remove non-native tree species from a site) should retain all downed wood debris on the ground. Thinning projects that involve road and landing (including those deemed "temporary") construction and/or reconstruction of road segments that have undergone significant recovery through non-use should also be prohibited, due to their long term impacts on critical watershed elements and processes.

The agency cannot rely on Best Management Practices to protect soil and watershed resources. Despite much improved best management practices, contemporary timber harvest can trigger serious cumulative watershed effects when too much of a watershed is harvested over too short a time period (Kleine 2011).

The Salmon River provides refuge for the near extinct Spring Chinook Salmon. In fact, six runs of anadromous salmonids use the Salmon River: Fall run Chinook; late Fall/Winter run Chinook; Steelhead, the ESA Candidate Spring run Chinook and the ESA listed Threatened Coho.

The willow flycatcher is a Region 5 sensitive species and a State listed threatened species. Current management direction is to provide for population viability through the protection of habitat in the form of riparian habitat such as riparian management reserves and wet meadows.

Any activity in RR's must be explained site-specifically in the forthcoming NEPA documents, including location, specific conditions, age class, and vegetation type to name a few. Please note extensive RR entry as a significant issue, especially in the context of cumulative effects.

Riparian areas are generally cooler and have greater moisture content than upslope areas. These conditions provide a natural barrier to fire spread or slow fire spread. The cooler temperatures, moister air and less flammable vegetation can combine to retard fire intensities (LSRA page 24). Logging in riparian reserves is generally prohibited by the NWFP. There is an exception where silviculture is "needed" to attain aquatic objectives, but there is no exception for logging intended to meet fuel objectives, especially given that the project area is not a priority area for fire risk reduction.

Key watersheds are the highest priority for watershed restoration. Logging large old trees and snags that are contributing critical elements of forest structure with ground based, cable and helicopter yarding, road construction/reconstruction, landings and skid trails would not restore but rather degrade the riparian elements within this Key watershed.

We are concerned with the cumulative effects of logging and road and landing construction. For instance, The Eddy Gulch LSR project approved 5,680 acres of underburning in RR's and 898 acres of RR's within commercial logging units. The DEIS on page 2-18 stated, "Small trees would be removed on 6,578 acres of RR's...with equipment within 30 feet of ephemeral, intermittent and perennial streams." The Caribou Salvage project contained 70 acres of Riparian Reserve harvest. The Caribou Site Preparation project proposed harvesting corridors in an undisclosed amount or Riparian Reserves. The Petersburg Pines Project consisted of 171 acres of commercial logging in RR's. The Jess project contained 120 acres of primarily tractor logging within RR's.

Please include all legacy sediment site locations and the mitigation plan for treating these sites. Please provide a detailed analysis of proposed impacts to soils, hydrology, geology, fishes and aquatic species. We would encourage the agency to follow the recommendations of the Upper South Fork Watershed Analysis and work towards the recovery of ESA protected Coho and Chinook salmon and the protection of aquatic species rather than continually entering fragile riparian ecosystems with heavy equipment in this world renowned river system.

SYSTEM ROADS

The 39N28 road appears to provide access in two directions. Roads 39N42 and 39N13, in Section 29 on the south side of Grasshopper Ridge, are mid-slope roads that, beyond the first mile, do not provide access to private lands. We question the strategy and priority these roads have for safe public access and firefighter safety. Please be descriptive in the forthcoming NEPA analysis as to why particular roads and areas have been chosen for treatment and their maintenance level. If these roads are truly a strategic and high priority for vegetation treatments we recommend creating shaded fuel breaks consistent with the Salmon River Wildfire Protection Plan.

TEMPORARY ROADS AND LANDINGS

The negative affect from the construction of roads, even "temporary", and landings is well documented. This is also true for the reconstruction. We are greatly concerned that the project proposes **sixty-seven new landings** in the Carter Meadows and Eddy Gulch LSRs and Critical Habitat for the Northern spotted owl (NSO). We urge the agency to avoid the long-lasting and often irreversible impacts of any temporary road and landing construction. Please see the report below from a compilation of scientific review entitled *The Watershed Impacts Of Forest Treatments To Reduce Fuels And Modify Fire Behavior* by Jonathan J. Rhodes:

> Roads and landings essentially zero out soil productivity for some time and reduce it for long periods thereafter (Geppert et al., 1984; Menning et al., 1996). This is the case even with "temporary" roads and landings. Due to the persistence of their impacts, "temporary" landings and roads do not have temporary impacts (Beschta et al, 2004). The negative effects of road and landing construction are

> large, enduring, and immediate, while recovery is relatively minor and protracted, even with obliteration, all of which belie any application of the term "temporary" (Beschta et al., 2004). The USFS has conceded that the loss of soil productivity on temporary landings and roads is not reversible, because such areas never completely regain their productivity or function naturally even with remediation or abandonment (BNF, 2001; RSNF, 2003).
>
> The degree of soil compaction on roads and landings retards vegetative recovery and vastly elevates surface erosion for decades after abandonment (Rhodes et al., 1994).

Hence, South Fork project planners should not assume that new roads would have little environmental effect because they are "temporary." In fact, scientific research has shown exactly the opposite. Research results, published in *Restoration Ecology,* show there is nothing temporary about temporary roads, and that ripping out a road is not the equivalent to never building a road to begin with. From Luce 1997*:*

> The saturated hydraulic conductivity of a ripped road following three rainfall events was significantly greater than that of the road surface before ripping... most saturated hydraulic conductivities after the third rainfall event on a ripped road were in the range of 22 to 35 mm/hr for the belt series and 7 to 25 mm/hr for the granitics. These conductivities are modest compared to the saturated hydraulic conductivity of a lightly disturbed forest soil of 60 to 80 mm/hr." *id*.
>
> Even this poor showing of restoring pre-road hydrologic effects worsened with repeated rainfall. "Hydraulic conductivity values for the ripped treatment on the granitic soil decreased about 50% with added rainfall ($p(K1=K2)=0.0015$). This corresponded to field observations of soil settlement and large clods of soil created by the fracture of the road surface dissolving under the rainfall... The saturated hydraulic conductivity of the ripped belt series soils also dropped from its initial value. Initially, and for much of the first event, the ripped plots on the belt series soil showed no runoff. During these periods, run-off from higher areas flowed to low areas and into macropores.... Erosion of fine sediment and small gravel eventually clogged these macropores... Anecdotal observations of roads ripped in earlier years revealed that after one winter, the surfaces were nearly as solid and dense as the original road surfaces." Id. Even though ripped roads increase water infiltration over un-ripped roads, it does not restore the forest to a pre-road condition.

Over the last few decades, studies in a variety of terrestrial and aquatic ecosystems have demonstrated that many of the most pervasive threats to biological diversity - habitat destruction and fragmentation, edge effects, impacts to hydrology and aquatic habitats, exotic species invasions, pollution, and poaching - are aggravated by roads and landings. Roads have been implicated as mortality sinks for animals ranging from snakes to ungulates; as displacement factors affecting animal distribution and movement patterns; as population fragmenting factors; as sources of sediments that clog streams and destroy

fisheries; as sources of deleterious edge effects; and as access corridors that encourage development, logging and poaching of rare plants and animals. See Noss *The Ecological Effects of Roads* and Spellerberg 2002 The Ecological Effect of Roads.

According to independent scientists, the spread of both native and exotic pests and pathogens in many forest systems can be linked to the travel corridors provided by extensive road networks. Please note that roads are one of the main vectors for noxious weed spread and introduction.

Attached to these comments is a peer-reviewed article by Trombulak and Frissell (2000) detailing some of the negative impacts of road construction and use on both terrestrial and aquatic ecosystems. The abstract for the article reads as follows:

> Roads are a widespread and increasing feature of most landscapes. We reviewed the scientific literature on the ecological effects of roads and found support for the general conclusion that they are associated with negative effects on biotic integrity in both terrestrial and aquatic ecosystems. Roads of all kinds have seven general effects: mortality from road construction, mortality from collision with vehicles, modification of animal behavior, alteration of the physical environment, alternative of the chemical environment, spread of exotics, and increased use of areas by humans. Road construction kills sessile and slow-moving organisms, injures organisms adjacent to a road, and alters physical conditions beneath a road. Vehicle collisions affect the demography of many species, both vertebrates and invertebrates; mitigation measures to reduce roadkill have been only partly successful. Roads alter animal behavior by causing changes in home ranges, movement, reproductive success, escape response, and physiological state. Roads change soil density, temperature, soil water content, light levels, dust, surface waters, patterns of runoff, and sedimentation, as well as adding heavy metals (especially lead), salts, organic molecules, ozone, and nutrients to roadside environments. Roads promote the dispersal of exotic species by altering habitats, stressing native species, and providing movement corridors. Roads also promote increased hunting, fishing, passive harassment of animals, and landscape modifications. Not all species and ecosystems are equally affected by roads, but overall the presence of roads is highly correlated with changes in species composition, population sizes, and hydrologic and geomorphic processes that shape aquatic and riparian systems. More experimental research is needed to complement post-hoc correlative studies. Our review underscores the importance to conservation of avoiding construction of new roads in roadless or sparsely roaded areas and of removal or restoration of existing roads to benefit both terrestrial and aquatic biota.

Attached to these comments you will find the published peer-reviewed article by Daniele Colombaroli and Daniel Gaven entitled Highly Episodic Fire and Erosion Regime Over the Past 2000 Years in the Siskiyou Mountains, Oregon. The study indicates that the past 50 years of logging and road construction have had much greater impacts to sediment

loading to watersheds than have wildfire events. These findings are directly relevant to the proposal to construct more logging roads and landings in the South Fork project area.

The cumulative impacts of "temporary" road construction, landing construction and widespread tractor yarding cannot be overstated. The large amount of forest removal and disturbance from these actions are not consistent with LSR direction. Details of the current condition, seral stage and location of any proposed landings and "temporary" and existing roads must be disclosed in the forthcoming NEPA document due to the ongoing significant impacts to hydrology, wildlife, fisheries and soils. Please decrease the project footprint and avoid the negative impacts of landing and road construction.

NORTHERN SPOTTED OWL

Please also see LSR Direction section above. All but one Northern spotted owl (NSO or strix) in the Carter Meadows LSR is deficient in suitable habitat. Many of the Activity Centers in the Eddy Gulch LSR are deficient. Much of the project area, particularly the Eddy LSR portion, falls within Critical Habitat Unit 25.

We cannot express strongly enough that the project should not remove or downgrade any suitable NSO habitat. The project should not degrade currently suitable habitat. Multiple Klamath National Forest (KNF), past, present and future projects have/has a likely to negatively affect determination for the strix. Recent KNF projects involve "take" of over 100 owls, some including the few reproductive pairs on the forest. The nearly adjacent Bear Country project has the potential to harm this species.

Owl populations continue to plummet; therefore it is of utmost importance to protect suitable habitat, especially forest stands containing reproductive pairs. These few active nest sites must be a priority for protection, according to the Recovery Plan. The agency has no idea what the baseline population is on a regional scale. What is know paints a very bleak picture for the future of this bird. The agency must work towards the recovery of this species.

Richard T. Brown, et al, *Forest Restoration and Fire: Principles in the Context of Place* (2004). In a section on mixed severity fire regimes, the author discusses the importance of key habitat areas provided by large old trees. This is also important for the discussion of habitat provided by large old snags, as efforts taken to remove them are detrimental to forest health:

> Past management practices may have led to development of old-growth stands with "unnatural" multiple canopy layers or accumulations of snags and logs, but these areas may provide key habitat that compensates for the loss and degradation of these habitat elements elsewhere (ICBEMP 2000; Wisdom et al. 2000). It may often be appropriate to attempt to secure such habitats from wildfire by treating adjacent areas (Agee 1996, 1998). Attention should be given to protecting large and old trees (Henjum et al. 1994; Allen et al. 2002). Large fir trees, especially those with heartwood decay, provide important habitat for many species (Bull et

al. 1992, 1997; Bull & Hohman 1993), and efforts to "cleanse" the landscape of true firs should be avoided. Strategic location of fuel treatments may slow the spread of fire across the landscape (Agee 1999; Finney 2001; Finney et al. 2002b), but this concept has been explored only in computer models and needs refinement before being extensively applied. *Id.*

There is no need for forestry "improvements" that do not aid in the recovery of the NSO. In order to protect NSO habitat and simultaneously increase forest resiliency the purpose and need for the project should focus on maintaining old growth and mature late seral trees while treating the small diameter understory and focusing around homes and communities. Forest health must be done in accordance with species protection.

We bring the Forest Service's attention to a study indicating that radio-tagged NSO's showed greatly reduced forage and roosting use in recently thinned stands as compared to pre-treatment. See Meiman, S., et al. 2002. *Effects of commercial thinning on spotted owl home range and habitat use patterns: A case study:*

Discussion-

Conclusions drawn from a case study of one animal have limitations...Nonetheless, the data collected on this study indicated that a commercial thinning in a second-growth Douglas-fir stand proximal to active nests of a northern spotted owl resulted in e**xpansion of the nonbreeding home range** of a male spotted owl, a **significantly reduced use of the thinned area** during and after harvest, and a **shift of the core use area away from the thinned stand**. These results suggest that the commercial thin had an immediate and short-term effect on home-range and habitat-use patterns of this male spotted owl.

Management implications-

Results of region-wide demographic analysis of spotted owls (Franklin et al. 1999, Anthony and Ellingson, Oregon State University, unpublished data) indicated that the spotted owl population in the Oregon North Coast is declining.

We therefore recommend that thinning operations not be conducted within core use areas in this region until further research on this topic is conducted.

In situations where core use areas have not been identified using radiotelemetry, we recommend that land managers identify the best spotted owl habitat (old conifer with multi-layered canopy and abundant snags) around the nest site and designate an area where no timber harvest activities will occur. The mean (100-ha) and maximum (250-ha) size of core use areas in the North Coast Range (Glenn et al. 2004) should be used as guidelines for delineating reserve areas. Where forest stands around owl nests are homogeneous and/ or the best habitat cannot be identified, an area with a 600-m radius (-115 ha) around the nest should

be used. This is comparable to the size of areas selected for nesting by spotted owls in the Oregon Cascade Mountains (Swindle et al. 1999).

Seamans and Gutierrez (2007) 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.

Dugger et al. 2011 found that thinning and its variants reduced the competitive advantage that spotted owls have in dense, old forest relative to the more aggressive barred owls, and exacerbated the negative effects that barred owls have on spotted owl occupancy. As described by Dugger et al., it is important not to exacerbate the effects of barred owl competition on spotted owl because the logging can reduce the competitive advantage for spotted owl.

The forthcoming NEPA must analyze and disclose the effects of the proposed treatment on the strix, its prey and habitat and barred owl competition. We again urge the agency to avoid harm and habitat degradation. Please follow KNF LRMP direction and of the Recovery Plan and provide restoration treatments that work to save this species from extinction.

THREATENED AND SENSITIVE SPECIES

> "Project areas should be surveyed for the presence of Sensitive species before project implementation. If surveys cannot be conducted, project areas should be assessed for the presence and condition of Sensitive species habitat." LRMP at 4-23

> "Management activities shall be compatible with the recovery of Endangered, Threatened (E&T) plants and animals." LRMP at 4-36

> "Collect information on Sensitive Species to assess population distribution and habitat associations**…Inventory a portion of the suitable habitat each year.** Assess conditions at occupied sites. Based on the assessment, use appropriate management techniques to maintain or enhance habitat suitability**.**" LRMP at 4-38

> "The KNF must "seek to conserve E&T species and shall utilize its authorities in furtherance of the Endangered Species Act." FSM 2670.11

> "Conservation strategies, including management objectives for habitat **and populations** of candidate species will be developed in cooperation with the FWS and CDF&G and implemented to **ensure viable populations** of these species throughout their geographic ranges to reduce the probability of their being federally listed." IV-96 LRMP

> "All proposed projects that involve disturbance to wildlife habitat and have potential to impact listed or sensitive wildlife species **will be evaluated to determine if any listed species are present**." IV-97 LRMP
>
> "Site specific habitat management plans are required for federally listed threatened and endangered species to protect and enhance essential habitat, and to explain allowable, desired and planned management activities within each area. **Habitat area (designated) management plans will be completed**, as part of the biological evaluation process, **for Sensitive wildlife species** that may be affected by proposed management activities." IV- 99 LRMP
>
> "Known nest sites, roost sites, den sites and associated **micro-habitat conditions will be protected for candidate species**:…" IV- 100 LRMP

Many Sensitive species require older forest structure, and all require relatively undisturbed, mature habitats for at least some part of their life cycle. Please retain large trees with late successional characteristics wherever they occur on this landscape. It is beyond due that the agency, actually perform surveys and create site-specific plans for Sensitive species, particularly fishers, which are now a candidate species under the federal ESA.

Many of the above NSO comments apply in equal strength to the goshawk. 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 provide details of survey results and disclose impacts from the proposed project on fishers and Northern goshawks and all other Sensitive species in the project area.

SURVEY AND MANAGE SPECIES and MANAGEMENT INDICATOR SPECIES

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 Surveys 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 forthcoming NEPA document must disclose the timing, results and influence of surveys for Survey and Manage Species and the impacts the proposed treatments would have on these and MIS species.

NEOTROPICAL MIGRATORY BIRDS

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. These studies suggest geographically widespread population declines that have provoked conservation concern for birds, particularly neotropical migrants. The Alexander 2005 report 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:

> 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.

The forthcoming NEPA for this project should analyze and disclose the potential impacts of logging operations and brush removal on neotropical bird population trends. 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 throughout its entire range.

PROJECT IS NOT CONSISTANT WITH SALMON RIVER COMMUNITY WILDFIRE PROTETION PLAN

The scoping proposal states, "This project is consistent with the direction of Salmon River Community Wildfire Protection Plan and Salmon River Fire Safe Council (CWPP) policy, objectives for accessible emergency access routes and the implementation of private property fire buffers. However, throughout the CWPP it is stated that "Emergency Access (and egress) Routes – Does not guarantee that fire fighters will be able to access area under extreme fire conditions."

The agency should not "cherry pick" only the portions of the CWPP that is useful to furthering their resource extraction tendencies. Please honestly consider all portions of the CWPP that the community, along with fire specialists, has developed:

> The Salmon River Fire Safe Council is responsible for helping to plan, implement and monitor the reinstatement of natural fire regimes in the Salmon River ecosystem in a manner that protects life, property, improves forest health, and enhances the resources valued by its stakeholders. Along with cooperators, the FSC is developing prescriptions for fuel reduction activities in WUI areas. These treatment variations are described below for the 5 different WUI area types that have been established.
>
> 1. Emergency Access and Escape Routes – Approximately 200 feet above and below road (use number 3 in prescription policy tables).
> 2. Property Buffers – Approximately 200 foot areas on public property surrounding individual properties, neighborhoods, and towns (Use number 2 in prescription policy tables).
> 3. Domestic Water Use – Use handpiling in jackpot areas, pullback from leave trees where appropriate, and underburning to achieve fuel reduction and watershed protection. 300 foot Shaded Fuel Breaks on ridge tops to protect watershed from outside fires, where appropriate.
> 4. 1⁄4 Mile Buffers – On public property surrounding individual properties, neighborhoods, and towns. Use handpiling in jackpot areas, pullback from leave trees where appropriate, and underburning to achieve fuel reduction and watershed protection.
> 5. Special Areas – These would include areas below properties located high on slopes, as well as culturally or biologically significant areas (Use number 1 in prescription policy tables). CWPP page 30
>
> Policy also recommends an upper diameter limit of 27 inches. In areas where managers recommend reducing the canopy below 60% or removing trees over 27 inches, the collaborative stewardship group shall review the options. As shown in numbers 2 and 3, proximity to a structure or other high value area would prescribe more vegetative material removed (with higher maintenance) than in outlying areas. The Salmon River CWPP at page 45
>
> Use Shaded Fuelbreak - this breaks up fuel continuity and the fuel ladder. For Late Seral Stands: leave 70 - 100% Canopy Cover (if available); For Mid Seral Stands (40' - 80'): leave 50 - 80% Canopy Cover (if available); For Early Seral Stands (conifer < 40'): leave 50 - 70% Canopy Cover (if available); For Eary Seral Stands (conifer/hardwood mix < 40'): leave 40 - 60% Canopy cover (if available); For Oak/Hardwood Stands: leave 30 - 80% Canopy cover (if available).

WILD AND SCENIC RIVER CORRIDOR AND VISUAL QUALITY OBJECTIVES

> "Management Goals-Protect the rivers and their immediate environments for the benefit and enjoyment of present and future generations. Protect and enhance the outstandingly remarkable value(s) for which the river is designated while providing for public recreation and resource uses that do not adversely impact or degrade those values." LRMP-158
>
> **"Conservation of the naturally established scenic character of the Forest environment is the primary goal of visual management."** LRMP 3-8
>
> "Impacts from human activities are primarily the result of past logging and road building." LRMP 3-8
>
> "Maintain VQOs as designated. Where possible, and where compatible with other resource objectives, strive for higher visual quality standards." LRMP 4-44
>
> "Management GOAL- Provide an attractive, forested landscape where management activities remain visually subordinate to the character of the landscape. Manage human activities so they are subordinate to the character of the landscape." LRMP 4-167

Landings, road construction, skid trails and the widespread proposed commercial logging would likely violate LRMP visual quality Goals and Standards and Guidelines and will impair the visual quality of the area in this land allocation. We are greatly concerned that the visual quality objects would not be met, given the widespread logging implemented and proposed throughout the entire Salmon River watershed.

The project must not harm the outstandingly remarkable values of the Wild and Scenic South Fork River, including Native American subsistence and ceremonial culture. Please accurately describe the location of these land allocations, the treatments proposed and the impacts to these values and objectives. Better yet, avoid the widespread environmental harm of the large-scale commercial logging and landing and road construction as proposed in the scoping notice.

CUMULATIVE EFFECTS, EFFICACY OF LOGGING AND EXTRAORDINARY CIRCUMSTANCES

While fires can have substantial effects on streams and riparian systems and may threaten the persistence of fish populations, particularly those that are small and isolated, efforts to actively manage fires and fuels in forests may be a threat rather than a benefit to conservation of wildlife and native fishes and their habitats. This is particularly true when treatments are focused on addressing forest management symptoms rather than the restoration of natural processes.

Mechanical treatments have proven to have serious negative effects on the landscape.

The impacts of mechanical vegetation treatments on watersheds are of concern because many aquatic systems are already degraded. In some instances fuel treatments actually work against watershed restoration because of the practices involved and the diversion of resources away from beneficial activities, such as road maintenance and removal.

A 2007 study entitled "The Watershed Impacts of Forest Treatments to Reduce Fuels and Modify Fire Behavior," authored by hydrologist Jonathan J. Rhodes, raises serious questions about the ecological efficacy of forest thinning and other mechanical fuel treatments intended to control wildfires – primarily because of their unintended but inevitable damage to forested watersheds.

The peer-reviewed report finds that the ecological costs of extensive thinning and other treatments are virtually inevitable: first, because many proposed projects necessarily involve repeated entries into the same area, which raises the scale of cumulative effects and effective level of disturbance; second, because the treatments cause direct impacts (e.g., they damage soils, cause erosion, disrupt streamflows, and damage riparian areas); and third, because the treatments fail to address the actual dominant causes of watershed degradation, such as road building. Combined, these factors can impede or set back ecologically sound efforts at aquatic ecosystem restoration.

Based on a detailed statistical analysis of a large body of fire data spanning many years, the report finds that mechanical fuel treatments are extremely unlikely to reduce the intensity of so-called catastrophic fires. In addition, the analysis finds that only in a small number of cases would treated areas likely be in the path of intense fire over their intended lifetimes (i.e., the period of time after treatment when fuels are reduced).

The report concludes with a precise set of recommendations to reduce the ecosystem damage from mechanical fuel treatments, including limiting treatments in the most sensitive portions of watersheds and prohibiting the most destructive fuel treatment activities.

In 2017 before the U.S. House of Representatives Natural Resources Committee, Subcommittee on Oversight and Investigations, Chief Scientist of the Geos Institute Dr. Dominick DellaSala testified:

> *Thinning is Ineffective in Extreme Fire Weather* – thinning/logging is most often proposed to reduce fire risk and lower fire intensity. Thinning-from-below of small diameter trees followed by prescribed fire in certain forest types can reduce fire severity (Brown et al. 2004, Kalies and Kent 2016) but only when there is not extreme fire weather (Moritz et al. 2014, Schoennagel et al. 2017). Fires occurring during extreme fire-weather (high winds, high temperatures, low humidity, low fuel moisture) will burn over large landscapes, regardless of thinning, and in some cases can burn hundreds or thousands of acres in just a few days (Stephens et al. 2015, Schoennagel et al. 2017). Fires driven by fire weather are unstoppable and are unsafe for fire fighters to attempt putting them out, and, as discussed, are more likely under a changing climate.

Further, there is a very low probability of a thinned site actually encountering a fire during the narrow window when tree density is lowest. For example, the probability of a fire hitting an area that has been thinned is about 3-8% on average, and thinning would need to be repeated every 10-15 years (depending on site productivity) to keep fuels at a minimum (Rhodes and Baker 2008).

Thinning too much of the overstory trees in a stand, especially removal of large fire-resistant trees, can increase the rate of fire spread by opening tree canopies and letting in more wind, can damage soils, introduce invasive species that increase flammable understory fuels, and impact wildlife habitat (Brown et al. 2004). Thinning also requires an extensive and expensive roads network that can degrade water quality by altering hydrological functions, including chronic sediment loads.

Thinning cannot limit or contain beetle outbreaks - once beetle populations reach widespread epidemic levels, thinning treatments aimed at stopping them do not reduce outbreak susceptibility as beetles over run natural forest defenses with or without thinning (Black et al. 2013).

In sum,

- The most effective way to protect homes is to create defensible space in the immediate 100 feet of a structure and use of non-flammable materials. Wildland fire policy should fund defensible space, not more logging and thinning miles away from communities.
- No amount of logging can stop insect outbreaks or large fires under extreme fire weather. Logging may; in fact, increase the amount of unnatural disturbances by homogenizing landscapes with more even aged trees, residual slash left on the ground, and compounding cumulative impacts to ecosystems.
- Thinning of small trees in certain forest types, maintaining canopy closure and in combination with prescribed fire can reduce fire intensity but treatment efficacy is limited in extreme fire weather, and by the small chance that a thinned site will encounter a fire during a very narrow window when fuels are lowest.

A thorough cumulative impact analysis of the proposed logging in combination with other timber sales, grazing impacts and private lands activities should be included in the forthcoming NEPA document. Future, present and the past management actions must be disclosed and analyzed in a comprehensive cumulative effects analysis. We believe that the significant cumulative impacts from future and past road and landing construction and federal logging have degraded the hydrological, soil, terrestrial habitat and connectivity values in the Salmon River watershed.

Because landscape level disturbance in these 303 (d) listed Key watersheds such as the Bear Country, Petersburg Pines, Jess, Eddy Gulch LSR, Salmon and Caribou salvage projects which entail landing construction, thousands of acres of ground based logging

and skyline corridors, and entry into Riparian Reserves assumption and reliance on Best Management Practices (BMP's) and Project Design Features (PDF's) will not suffice in meeting CWA, NFP or Basin Plan Standards. The agency must adequately consider and disclose how the proposed action will fully comply with all applicable requirements.

The Klamath National Forest should familiarize itself with the 9th Circuit's opinion in Klamath-Siskiyou Wildlands Center v. BLM. 387 F.3d 989 (9th Cir. 2004). In that case the Court held that:

> "A calculation of the total number of acres to be harvested in the watershed is a necessary component of a cumulative effects analysis, but it is not a sufficient description of the actual environmental effects that can be expected from logging those acres."

The Court went on to conclude that the agency's NEPA document:

> "…cannot simply offer conclusions. Rather, it must identify and discuss the impacts that will be caused by each successive timber sale, including how the combination of those various impacts is expected to affect the environment, so as to provide a reasonably thorough assessment of the project's cumulative impacts."

The forthcoming NEPA should give serious and careful consideration of the cumulative effects of the proposed actions (and alternatives) on soils, hydrologic function, habitat and wildlife in the context of past, present, and reasonably foreseeable future actions in the region. We are very concerned that the proposed action will not improve, and may well worsen, some of the problematic resource conditions resulting from intensive logging which has been documented, including fragmentation of forest habitat, soil damage, and a paucity of mature and late-successional trees and forest and associated habitat.

LARGE TREE RETENTION

> "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)

As shown throughout these comments, large trees play an increasing valuable role in forest ecosystems and ecosystem services. Please follow KNF LRMP, NFP and Recovery Plan standards and guidelines by retain large mature trees with late successional characteristics.

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 LRMP direction snag retention is based on a per acre requirement, not at a landscape scale.

Snags play an integral role in the ecology of old-growth forests. Indeed, the NFP expressly states:

> Tree mortality is an important and natural process within a forest ecosystem. Diseased and damaged trees and logs are key structural components of late-successional and old-growth forests. Salvage of dead trees affects the development of future stands and habitat quality for a number of organisms. Snag removal may result in long-term influences on forest stands because large snags are not produced in natural stands until trees become large and begin to die from natural mortality. Snags are used extensively by cavity-nesting birds and mammals such as woodpeckers, nuthatches, chickadees, squirrels, red tree voles, and American marten. Removal of snags following disturbance may reduce the carrying capacity of these species for many years.

The importance of snags, logs, and other CWD is also recognized in FEMAT (1993) scientific analysis. For example:

> "Because of the important role of dead wood in late-successional and old-growth forest ecosystems, and because there is much to learn about the role of dead wood in the development of forests, only limited salvage is appropriate in Late-Successional Reserves . . . The Final Draft Recovery Plan [for the NSO] would allow removal of small-diameter snags and logs, but would also require retention of snags and logs likely to persist until the new stand begins to contribute significant quantities of coarse woody debris." FEMAT 1993, p. IV-37

> "Snags provide a variety of habitat benefits for a variety of wildlife species associated with late-successional forests. Accordingly, following stand-replacing disturbances, management should focus on retaining snags that are likely to persist until late-successional conditions have developed and the new stand is again producing large snags." FEMAT 1993, p. III-37

In general, the contribution of very large logs (e.g., 20 inches in diameter, or larger) to fire severity and intensity is almost negligible, as they are the fuels least available for combustion. When these large logs do burn, it is because the smaller fuels needed to ignite them and sustain combustion are present. Logs also burn mainly by smoldering combustion, which is not considered in the calculation of fire intensity. This is the reason why relatively high fuel loads comprised primarily of large-diameter woody material can be present without eliciting high intensity fire effects.

At C-40 the NFP informs the Forest Service:

> A renewable supply of large down logs is critical for maintaining populations of fungi, anthropods, bryophytes and various other organisms that use this habitat structure. Provision of coarse woody debris is also a key standard and guideline for American marten, fisher, two amphibians, and two species of vascular plants…Coarse woody debris that is already on the ground needs to be retained and protected from disturbance to the greatest extent possible during logging and other land management activities that might destroy the integrity of the substrate. Scattered green trees will provide a future supply of down woody material as the stand regenerates and are important in providing for the distribution of this substrate through out the managed landscape.

Please be descriptive on current CWD/Snag status in units. CWD/Snags are an essential component of healthy forests and contribute to soil vitality and productivity, in addition to providing quality habitat for predator and prey species. The LRMP instructs the Forest to protect CWD to the fullest extent possible. Tractor-based yarding under the proposed action could affect CWD/Snag levels. Please also disclose the effects that activities will have on CWD/Snags. If snag levels are low, marking guidelines must reflect the need for considering future snag recruitment. We are concerned about harvesting snags along ridge tops and roads and how that may lead to habitat fragmentation. Please analyze this in the NEPA document.

Coarse woody debris is a necessary component of forest ecosystems. This wood provides habitat for a broad array of vertebrates, invertebrates, fungi, mosses, vascular plants, and micro-organisms. Arthropods, salamanders, reptiles, and small mammals live in or under logs; woodpeckers forage on them; and vascular plants and fungi grow on rotting logs. Provision for retention of snags and logs normally should be made, at least until the new stand begins to contribute coarse woody debris. Many natural disturbances do not result in complete mortality of stands. The surviving trees are important elements of the new stand. They provide structural diversity and provide a potential source of additional large

snags during the development of new stands. Furthermore, trees injured by disturbance may develop cavities, deformed crowns, and limbs, which are habitat components for a variety of wildlife species. Disturbance is an important natural process in late successional reserves, because it allows for a greater range of tree sizes and types than could be achieved through intensive logging.

Coarse woody debris is essential for many species of vascular plants, fungi, liverworts, mosses, lichens, arthropods, salamanders, reptiles and small mammals. Adequate numbers of large snags and green trees are especially critical for bats because these trees are used for maternity roosts, temporary night roosts, day roosts, and hibernacula. Large snags and green trees should be well distributed because bats compete with primary excavators and other species that use cavities. Day and night roosts are often located at different sites, and migrating bats may roost under bark in small groups. Thermal stability within a roost site is important for bats, and large snags and green trees provide that stability. Individual bat colonies may use several roosts during a season as temperature and weather conditions change. Roosting bats may also use large, down logs with loose bark. All large trees should be retained in late successional reserves regardless of whether they are diseased or not because they play important roles while standing, decaying and lying on the forest floor.

INVASIVE NON-NATIVE PLANTS

Please address how the proposed logging, landing and road construction will likely increase non-native plant species as research has documented. See Merriam 2007:

> 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.

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."

SIGNIFICANCE AND THE NATIONAL ENVIRONMENTAL POLICY ACT

Section §1508.27 of NEPA describes "Significantly". Below are significant issues that we believe trigger a detailed Environmental Impact Statement for this project. We ask you to recognize the extraordinary circumstances involved with the proposed project.

(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas.

(4) The degree to which the effects on the quality of human environment are likely to be highly controversial.

(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small components.

(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined critical under the Endangered Species Act of 1973.

(10) Whether the action threatens a violation of Federal, State or local law or requirements imposed for the protection of the environment.

The South Fork project contains significant issues and, cumulatively with other KNF projects, present extraordinary circumstance that require the completion of an EIS. Please address the significant issues in the forthcoming NEPA document.

HELICOPTER LOGGING

Helicopter logging would leave abundant and flammable slash on very steep slopes, increasing fire risk. Follow-up fuels treatments, particularly underburning are rarely completed. Further, the agency already has thousands of acres already planned for underburning, much of it in the Salmon River watershed. This area is of very low priority for treatment. The forthcoming NEPA should speak to the overall fire strategy in the region and prioritize areas for maintenance. Helicopter logging is associated with the logging of many large diameter trees. As expressed throughout these comments this is inconsistent with KNF and NFP requirements for LSRs. Helicopter logging also requires large service landings that are incompatible with this land allocation.

FOREST HEALTH

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. 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.

Ecological disturbances from insects and disease have always been a natural and healthy part of these ecosystems. LSRs were set aside to allow for natural disturbances. The value of these natural processes is immeasurable to old-growth and mature forest dependent species. Logging and burning often exacerbates disturbances (Malonely 2008). Please provide further detail on what "forest health" definition will guide the agencies prescriptions.

CONCLUSION

The East Fork of the South Fork Salmon River and the Carter Meadows LSR is a vital wildlife connectivity corridor that is providing important microrefugia. Dense forest canopy and mature forests and trees are critical for the survival of multiple old-growth dependant species within the project area. The world-renowned Salmon River watershed is a stronghold for imperiled wild salmon. We urge project planners to work towards the recovery and restoration in this river system.

We believe that the agency can best accomplish the project purpose and need through a focus on thinning early seral stands, around homes and roadside fuel breaks. If the agency intends to log existing mid-seral forests in the planning area treatments should concentrate on south facing slopes. It is essential that large-diameter trees, canopy cover and late-successional forest characteristic be retained.

Please consider an alternative or alternatives that would:

Treat understory vegetation around homes
Treat plantations, early seral forest stands and meadows
Include thinning from below only on south and west facing slopes in mid mature stands.
Retain all trees with late successional characteristics
Greatly reduces the amount of proposed landings and
Reduce the amount of road construction.

As proposed the significant issues and ecological harms of widespread commercial logging and landing and road construction greatly outweigh any claimed forest health objectives. Please consider and analyze a wide range of alternatives and focus on high priority areas that the agency is able to maintain. We again urge the KNF to protect and restore the wildlife, water quality and wild salmon of the South Fork Salmon River.

Please send hard copies of the forthcoming NEPA documents to the EPIC and KS Wild offices. We appreciate the consideration.

Sincerely,

Kimberly Baker
Executive Director
Klamath Forest Alliance
PO Box 21
Orleans, CA 95556

Thomas Wheeler
Executive Director
EPIC-Environmental Protection Information Center
145 G. St., Suite A
Arcata, CA 95521

George Sexton
Conservation Director
Klamath Siskiyou Wildlands Center
P.O. Box 102
Ashland, OR 97520

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