KLAMATH
FOREST ALLIANCE

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Dear Supervisor Smith and River Complex planning team,

Please accept these **Draft Environmental Analysis (EA) River Complex** comments on behalf of the Klamath Forest Alliance, as an addendum to those submitted March 8, 2023. The project is located in the headwaters of the South Fork Salmon (Taylor Creek) and Scott Rivers and proposes to treat 6,755 acres, including: Commercial Roadside Logging using a 0.6 probability of mortality (1,913); Commercial Salvage Logging (1,711 acres); Roadside Fuels Reduction (869 acres); Plantation treatments, that include cutting, mastication or machine piling and planting (799 acres); Prescribed Fire (580 acres); Ridgetop Fuels Reduction (478 acres); Private Property Fuels Reduction (186 acres) and; Trails Fuel Reduction (55 acres). The project would utilize access along 1.45 miles of temporary roads on areas of existing disturbance and would construct 0.19 miles of new “temporary”. It is anticipated that 45 landings would be needed. The appears the project proposes commercially log 844 aces within Riparian Reserves and nearly 3,000 acres within the Taylor Lake/Carter Meadow Late Successional Reserve (Taylor Creek LSR).

<u>Issues Considered</u>

It appears from the Draft EA that our scoping comments, recommendations and the reams of scientific research were not incorporated in project planning. In fact, the project treatments increased by 2,000 acres with the addition of Roadside Commercial Logging.

Issue # 1, described in the EA, misses the mark. It is not just the importance of early seral habitat. It is the importance of *complex* early seral habitat. Complex early seral habitat includes large snags and biological legacies. Shade and cooler microclimates from snags increase seedling survival and regeneration. The many critical life-giving ecological services that large snags provide are described in our scoping comments and scientific studies provided to the agency and in the administrative record.

Issue #2, speaks to the risk of increased fuel loading. The "*proposed action is designed to account for this risk by including activity fuel reduction treatments as a follow up to the proposed salvage harvest treatments*." Given the track record of the Klamath National Forest to follow up with fuels treatments, it is likely that these activities would not occur or would take many years to complete. There is no modelling included that reflects this likelihood.

The EA lists Management Actions for LSRs. It provides emphasis on, "*Salvage activities should focus on reduction of catastrophic insect, disease and fire threats. Treatments should be designed to provide effective fuel breaks wherever possible."* We do not oppose the ridge top fuel break. The emphasis should be on, "***However, the scale of salvage and other treatments should not generally result in degeneration of currently suitable owl habitat or other late-successional conditions."*** Please see the section on owls below. Late successional conditions include, the complex forest structure that large snags provide.

The project does not assure the long-term maintenance of habitat, it would likely remove it. The project is not clearly needed and it would likely affect the Taylor Creek LSR from playing an effective role in the objectives for which it was established.

Issue #3 concerns conifer planting. Project planners should consider aspect. Much of the project treatment area is on more north and east facing slopes. The cooler microclimates on these slopes provide better conditions for natural regeneration. In addition, there are multiple patches of living trees very near high severity burn areas to provide seed sources. This is another reason why the proposed roadside logging should retain all living trees.

Issue #4, the FS uses the argument that "*Trees that initially survived the fire but die within a year or two can produce a cone 'stress crop' before succumbing to fire injury. However, conifers experiencing stress from fire damage that is compounded by the ongoing drought in the region are not likely to make for an adequate seed source (Griffis and Lippitt 2021). The seeds from these trees alone are not likely to result in the regeneration of a well-stocked, resilient forest*." First, please provide more information on "stress crops". Second, please also provide the page from Griffis and Lippet discussion as we could not find the information it referenced. It is important to note that Griffis and Lippitt stress the importance of seed origin "because trees are locally adapted to the numerous characteristics of the environment they are naturally growing in." Third, it is not these trees alone that would provide local native seed sources it is in combination with the living trees in and adjacent to the project area. There individual locations make them an invaluable seed source.

Tree species in the region are adapted to fire, including Douglas fir. Living trees are providing fire refugia. Scorched larger trees with thicker bark have a better chance of surviving fire. The agency should consider: tree species; diameter; aspect; the importance of this landscape (LSR, Critical Habitat, Riparian Reserves, status and needs of species, et) and; checking the cambium when determining the probability of mortality in planning.

Incorporating by inclusion attached to these comments, please see *The Ecological Consequences, Increased Fuel Loads and Reburn Hypothesis* and the *Legacy Snag Retention* sections of our Antelope Tennant EA comments on the Klamath National Forest Goosenest District, as they are directly relevant to the River Complex project.

Further research that addresses the issues above should be considered and is provided.

Joint Fire Science Program, Fire Science Brief, Issue 14, September 2008.

Key Findings:

- Managed and unmanaged stands exhibited the same surface fuel loads 17–18 years after fire, when re-burn potential is high.
- The potential for severe re-burn was driven by the inherent structure of young vegetation, and much less by
  residual woody material from the previous fire.
- Natural conifer regeneration typically exceeded prescribed densities without additional planting or intervention in
  areas within 400 yards of live forest edges.
- Extended periods of early seral shrub dominance and short interval, high-severity fires appear to be important for conservation of avian biodiversity.
- Short-term fire effects on small mammal communities were more significant than those of postfire salvage logging.

Northern Rockies Fire Science Program, Research Brief 15, September 2022
River Complex.

Key Findings:

- Wildfires increase microclimatic extremes by removing canopy cover, resulting in warmer and drier growing season conditions in the years immediately after a wildfire. These impacts are most pronounced during mid-summer, in areas burned with high severity, and in weather topographic settings.
- Forest recovery after wildfires can be robust under moderate seasonal climate conditions, given that seeds are available and microclimate and microsite conditions are suitable.
- Our results suggest that retaining canopy cover, even from standing snags, moderate's microclimate conditions. Management actions that remove standing dead trees could further increase microclimate extremes, with the potential to impact seedling survival and regeneration.
- Reforestation may be most effective in areas that burned at high-severity far from live seed sources, in cool-moist topographic settings, and when targeting favorable microsites.
- Spatial models were effective at predicting postfire seedling density based on topo climate data and fire severity information, supporting the use of similar models in reforestation planning.

Maria J. Lopez Ortiz, Terry Marcey, Melissa S. Lucasc, David Hibbs, Jeffrey P.A. Shatford, Jonathan R. Thompson. Post-fire management affects species composition but not Douglas-fir regeneration in the Klamath Mountain. Forest Ecology and Management 432 (2019) 1030–1040

Excerpts (references omitted):

- New policies of ecosystem-based management in the Klamath region should consider the important interactions between aspect and post-fire management, and tailor management practices based on specific objectives and landscape context.

- Overall, conifer regeneration was strongly influenced by aspect, which is consistent with previous studies. Drought stress and soil surface temperature are generally higher on south aspects which reduced regeneration, particularly for Douglas-fir. This is consistent with reports that found soil surface temperature to exceed temperatures lethal to Douglas-fir seedlings on south facing clear-cuts almost twice as frequently as on north facing clear-cuts.

- There are many gaps in our present understanding of the importance of early seral communities to ecosystem processes and its changes in response to postfire management.

Thorn, S., multiple authors. 2018. Impacts of salvage logging on biodiversity: a meta-analysis. J. Applied Ecology DOI: 10.1111/1365-2664.12945;
https://besjournals.onlinelibrary.wiley.com/doi/10.1111/1365-2664.12945

Abstract:

1. Logging to “salvage” economic returns from forests affected by natural disturbances has become increasingly prevalent globally. Despite potential negative effects on biodiversity, salvage logging is often conducted, even in areas otherwise excluded from logging and reserved for nature conservation, inter alia because strategic priorities for post-disturbance management are widely lacking.

2. A review of the existing literature revealed that most studies investigating the effects of salvage logging on biodiversity have been conducted less than 5 years following natural disturbances, and focused on non-saproxylic organisms.

3. A meta-analysis across 24 species groups revealed that salvage logging significantly decreases numbers of species of eight taxonomic groups. Richness of dead wood dependent taxa (i.e. saproxylic organisms) decreased more strongly than richness of non-saproxylic taxa. In contrast, taxonomic groups typically associated with open habitats increased in the number of species after salvage logging.

4. By analysing 134 original species abundance matrices, we demonstrate that salvage logging significantly alters community composition in 7 of 17 species groups, particularly affecting saproxylic assemblages.

5. Synthesis and applications. Our results suggest that salvage logging is not consistent with the management objectives of protected areas. Substantial changes, such as the retention of dead wood in naturally disturbed forests, are needed to support biodiversity. Future research should investigate the amount and spatiotemporal distribution of retained dead wood needed to maintain all components of biodiversity.

This study was done on the Klamath National Forest. Jeffrey P.A. Shatford, Hibbs, David E. Predicting Post-Fire Regeneration Needs: Spatial and Temporal Variation in Natural Regeneration in Northern California and Southwest Oregon. **Final Report.** Joint Fire Science Program. 2007:

Key Findings:

- On most sites, natural regeneration of conifers was abundant 10 to 20 years after high severity forest fire in the Klamath-Siskiyou region of northern California and southwest Oregon.
- Natural regeneration was most limited on the drier, hotter sites(low elevation, eastern Klamath Mountains).
- Natural regeneration of conifers was usually abundant up to 450m from living trees. It was difficult to find places more than 450m from living trees.
- Conifers continued regenerating 10-15 years after the fire.
- While most conifers were still within the shrub matrix, many were already well above the shrub layer. Even those still within the shrub canopy had reasonable height growth and good live crown ratios (average 68%) suggesting they would survive and grow above the competing vegetation.
- Nine to 19 years after high severity wildfire, average conifer density varied among forest types, for example, the True Fir zone 2,454 (±529 stderr) trees/ac. (median 2,104), Douglas-fir/Tanoak zone 1038.4 (±stderr 266.3, n=18) trees/ac. (median 725.4) and lowest in the mixed conifer zone at 775.3 (±stderr 181, n=62) trees/ac (median 223.5).
- Shrub cover was always dense.
- Hardwood regeneration as stump sprouts was also abundant except at higher elevations.

Dominick A. DellaSala, Ph. D, Timothy Ingalsbee, Ph. D, Chad T. Hanson, Ph. D. *Everything You Wanted To Know About Wildland Fires In Forests But Were Afraid To Ask: Lessons Learned, Ways Forward*. March 30, 2018:

Key Findings:

- Large wildland fire complexes, including patches of high severity fire, generate critical ecological pulses of dead trees (biological legacies) that are associated with extraordinary levels of biodiversity under-appreciated by most.
- Using long historical timelines, wildfire acres are currently at historical lows, but have been increasing in recent decades due mainly to three factors: (1) climate change; (2) human-caused fire ignitions (including suppression firing operations such as burnout and backfires); and (3) conversion of fire-resilient native forests to flammable plantations that experience relatively more high fire severity fire.

- Throwing more money at fire suppression will not abate fire concerns as more and more homes are built in indefensible places and are not designed or built with fire-resistant materials.
- Post-fire logging and associated activities (including roads) are unequivocally damaging to fire-rejuvenated forests and related aquatic ecosystems.
- Thinning small trees and prescribed burning can lower fire intensity at the stand level if done properly but this has significant limitations and ecological consequences given the scale of the perceived need and a changing climate.
- The most effective pathway to fire coexistence is to: (1) limit ex-urban sprawl through land-use zoning; (2) lower existing home ignition factors by working from the home-out with vegetation management and home retrofitting (defensible space), instead of the wildlands-in (logging); (3) thinning of small trees and prescribed burning in ecologically appropriate settings (e.g., flammable plantations) while prioritizing wildland fire use in most forests away from homes; (4) store more carbon in ecosystems by protecting public forests and incentivizing carbon stewardship on non-federal lands; and (5) shift to a low-carbon economy as quickly as possible. Anything else will not achieve desired results to scale.

Dense Forests are not all a Result of Fire Suppression

The EA makes blanket statements such as (citations omitted), "*The density of fire-killed trees per acre in the River Complex Fire area is much higher than the density of trees that existed naturally in the pre-suppression era. Since the density of trees per acre is substantially higher than historical levels because of fire suppression, it follows that the amount of heavy fuel created by these dead trees will be much higher than historical levels..*." Although forest composition has changed in many areas because of fire suppression, it is not necessarily true everywhere. When timber sale planners use this verbiage, they should also include the fact that forest composition has changed primarily because of the extreme logging done by the Forest Service since its' inception. Logging is responsible for removing the >90% of our old-growth forest and replaced it with millions of acres of highly flammable homogenous tree plantations. The agency should avoid assumptions such as these and instead provide site-specific stand history in planning areas so that the public and decision maker are provided with useful information.

Please see the compiled literature review compiled by the John Muir Project.

> Excerpt:
> **Forests today are not "overgrown".** In fact, due to logging, which has been removing vast numbers of trees from public and private forests in the U.S. for many decades, we currently have far less biomass, and therefore carbon, in most of our forests than they would otherwise naturally have. In the western U.S., for example, the most current and comprehensive research concludes that, historically (before fire suppression and logging), forest density was highly variable. "Open" forests with relatively low tree densities were a minor portion of the forested landscape, including in ponderosa pine and mixed-conifer forests. Most of these forest types were moderately to very dense historically, with hundreds of seedlings, saplings and small trees per acre, and several dozen or more mature/old trees per acre, often with dense shrub understories. This variability in density

was shaped by mixed-intensity fire, which included both small and very large patches of high-intensity fire. These high-intensity fire patches typically covered between 22% and 39% of the total area burned in wildfires (the remaining 61% to 78% was comprised of low/moderate-intensity fire). Recent studies by U.S. Forest Service scientists, claiming that historical tree densities in western forests were much lower than they are today, left out of their assessments data on small tree density, and density of non-conifer trees like oaks. When this error was corrected by subsequent researchers, and these missing data were included, it was determined that historical tree density was on average 7 times higher than claimed by the Forest Service in ponderosa pine forests, and 17 times higher in mixed-conifer forests.

Northern Spotted Owl

We are very concerned with the direct and indirect harm to NSO's in Taylor Creek. The agency must work towards the recovery of NSOs. We urge the KNF to: retain all suitable habitat, including post-fire foraging; not salvage log nest cores or deficient home ranges; designate all previous Nest/Roost habitat as post-fire foraging; fully incorporate Recovery Action 12.

Despite not having any site-specific information in the EA, we make our best attempt to provide Forest Service staff with pertinent knowledge that should be considered and analyzed in an EA and Biological Assessment.

Project design features are not a substitute for evaluating impacts to an endangered (warranted but precluded) species. It is not adequate to state that "current NSO habitat suitability would be determined prior to implementation". The public and decision maker must know prior to public comment and a decision how the agency is determining "suitable" habitat, where it is located and what is being proposed.

The best available scientific data confirms that spotted owls use unlogged, burned snag forest habitat and that it functions as foraging habitat. It has been shown that spotted owls will not use post-fire logged habitat.

The following research is applicable and should be incorporated in the analysis of impacts to habitat, as it may help the agency to define suitable habitat and to revise activities to prevent taking suitable habitat.

Raphael et al. 2013[1]: a coarse-scale simulation of forest succession, wildfire effects, and thinning treatments on spotted owl habitat in Oregon and Washington projected over a 100-year time series which found active "fuel reduction" was anticipated to cause substantial short-term (simulation years 0-30) owl population declines.

[1] Raphael, Martin G.; Hessburg, Paul; Kennedy, Rebecca; Lehmkuhl, John; Marcot, Bruce G.; Scheller, Robert; Singleton, Peter; and Spies, Thomas, Assessing the Compatibility of Fuel Treatments, Wildfire Risk, and Conservation of Northern Spotted Owl Habitats and Populations in the Eastern Cascades: A Multi-scale Analysis, (2013). JFSP Research Project Reports. 31.

Odion et al. 2014[2]: tested whether the forest thinning recommendations in unburned owl habitat constituted a short-term impact to avoid the longer-term effect of high-severity fires as required in the spotted owl recovery plan. Rotations of severe fire in spotted owl territories were 362 and 913 years for the Klamath and dry Cascades provinces, respectively—more than adequate to sustain old- growth forests in fire-dominated regions. They projected that over a 40-year period, thinning would remove 3-6 times more-dense, late-successional forests than it presumably “saved” from high-severity fire. Even if rates of high-severity fire increased under climate change, the recovery plan requirement that the long-term benefits of commercial thinning clearly outweigh adverse short-term impacts was summarily rejected. The researchers also concluded that exclusion of high-severity fire may not benefit spotted owls in areas where owls evolved with reoccurring fires, due to owl foraging preferences.

Lee 2018[3]: found that wildfires of mixed severity had mostly positive effects on owl recruitment, owl reproduction, and owl foraging in low- and moderate-severity burns with the inclusion of high-severity patches. Generally, where owls abandoned nesting territories there was clear evidence that unoccupied sites were associated with logging rather than wildfires. Despite these findings, wildfire is routinely considered a primary cause of habitat loss in planning recovery actions, even though fire effects are in dispute.

Hanson, Bond, and Lee 2018[4]: Owls preferentially select high-severity fire areas, characterized by high levels of snags and native shrubs, for foraging in forests that were not logged after fire, suggesting that removal of this foraging habitat might impact occupancy. The authors assessed the effect of post-fire logging and high-severity fire on occupancy in eight large fire areas, within spotted owl sites with two different levels of high-severity fire effects. They found a significant adverse effect of such logging and no effect of high-severity fire alone. These results indicate it is post-fire logging, not large fires themselves, that poses a conservation threat to this imperiled species.

Hanson, Lee, and Bond 2021[5]: A literature review of 13 published papers across all subspecies of spotted owl determined that spotted owl populations have been declining in managed forests that were largely unaffected by recent wildfires while remaining stable in unmanaged forests that experienced large fires. Despite this, it remains a commonly held belief that large fires are a primary threat to spotted owl species persistence. Seemingly minor amounts of post-fire logging (as little as 5%) significantly reduce spotted owl occupancy. Authors recommend avoidance of all post-fire logging activities (including roadside work as proposed here) within 1.25 miles of site centers.

[2] Odion et al., Effects of Fire and Commercial Thinning on Future Habitat of the Northern Spotted Owl, The Open Ecology Journal, 2014, 7, 37-51.
[3] Lee, D.E., Spotted Owls and forest fire: a systematic review and meta-analysis of the evidence. Ecosphere 9 (7), (2018) 22.
[4] Hanson CT, Bond ML, Lee DE (2018) Effects of post-fire logging on California spotted owl occupancy. Nature Conservation 24: 93–105.
[5] Hanson, C.T., Lee, D.E., Bond, M.L. Disentangling Post-Fire Logging and High-Severity Fire Effects for Spotted Owls. Birds (2021) 2, 147–157.

Hanson 2021[6]: found that pre-fire snag density was not correlated with burn severity. More intensive forest management was correlated to higher fire severity. Results suggest the fuel reduction approach is not justified and provide indirect evidence that such management represents a threat to the spotted owl.

Hanson and Chi 2021[7]: Natural regeneration of conifer trees after fire was abundant, including in the interior of the largest high-intensity fire patches within the Rim fire. This implies managers do not need to subject forests to the well-documented harms caused by post-fire logging and replanting.

Because there is a major ongoing scientific controversy regarding spotted owl use of post-fire landscapes, the agencies must review whether its assumptions regarding continued suitability of habitat after the fire are justified.[8] The debate is well summed up:

> Further south (e.g., Klamath providence of California) and in drier mixed conifer forests along the eastern slopes of the Cascades in Washington and Oregon, the spotted owl nests in older forests juxtaposed with dense shrubs occupied by its favorite meal—woodrats (Neotoma spp.) (Forsman et al., 2004). Here, fire is Nature's architect that periodically sculptures a mosaic of burn severity habitat patches (e.g., low, moderate, and severe fire effects on tree mortality, Fig. 5.2B) that the owl does best in (Franklin et al., 2000; Dugger et al., 2005; Lee, 2018). Reoccurring wildfires produce a "bed-and-breakfast" like effect where older forest patches that survived fire serve as the owls' "bedroom," and severely burned patches where most trees were killed, the "breakfast room." Just how much of each the owl needs is the subject of intense debate (see Jones et al., 2016 vs. Lee, 2018, see below) with important recovery implications.[9]

The EA/BA should address the 2021 Franklin et al. meta-analysis[10] of spotted owl population demographics and should incorporate data from USFWS's 2020 finding warranted for "uplisting" to "endangered"[11] in its analysis of the project's impacts.
Does this important new information affect the Forest Service's risk analysis regarding whether and where it would operate in spotted owl habitat or in known spotted owl sites? How has the change in baseline conditions for habitat affected NSO populations?

The NSO Recovery Plan gives a fair overview of the state of the science regarding post-fire forest management and restoration. The plan recognizes the natural role of fire in developing and

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[6] Hanson, C.T., Is "Fuel Reduction" Justified as Fire Management in Spotted Owl Habitat? Birds (2021), 2, 395–403.
[7] Hanson and Chi, Impacts of Postfire Management Are Unjustified in Spotted Owl Habitat, Frontiers in Ecology and Evolution, February 20, 2021.
[8] See, e.g., *Bark v. U.S. Forest Serv*., 958 F.3d 865 (9th Cir. 2020).
[9] DellaSala, Conservation Science and Advocacy for a Planet in Peril, Elsevier, 2021, pp. 99-126.
[10] Franklin et al., Range-wide declines of northern spotted owl populations in the Pacific Northwest: A meta-analysis. Biological Conservation. July 2021. Abstract. ("Our analyses indicated that northern spotted owl populations potentially face extirpation if the negative effects of barred owls are not ameliorated while maintaining northern spotted owl habitat across their range.")
[11] 17 85 FR 81144, Dec. 15, 2020.

maintaining complex habitat supporting spotted owls and diverse prey species. Relevant parts of the recovery plan state:

- "There is evidence of spotted owls occupying territories that have been burned by fires of all severities. The limited data on spotted owl use of burned areas seems to indicate that different fire severities may provide for different functions."[12]

- "... [S]support is lacking for the contention that reduction of fuels from post-fire harvest reduces the intensity of subsequent fires (McIver and Starr 2000), and planting of trees after post-fire harvest can have the opposite effect."[13]

- "Detrimental ecological effects of post-fire timber harvest include: increased erosion and sedimentation, especially due to construction of new roads; damage to soils and nutrient-cycling processes due to compaction and displacement of soils; reduction in soil-nutrient levels; removal of snags and, in many cases, live trees (both of which are habitat for spotted owls and their prey); decreased regeneration of trees; shortening in duration of early-successional ecosystems; increased spread of weeds from vehicles; damage to recolonizing vegetation; reduction in hiding cover and downed woody material used by spotted owl prey; altered composition of plant species; increased short-term fire risk when harvest generated slash is not treated and medium-term fire risk due to creation of conifer plantations; reduction in shading; increase in soil and stream temperatures; and alterations of patterns of landscape heterogeneity . . . ."[14]

- "Consistent with restoration goals, post-fire management . . . should promote the development of habitat elements that support spotted owls and their prey, especially those which require the most time to develop or recover (e.g., large trees, snags, downed wood). Such management should include retention of large trees and defective trees, rehabilitation of roads and firelines, and planting of native species (Beschta et al. 2004, Hutto 2006, Peterson et al. 2009). **We anticipate many cases where the best approach to retain these features involves few or no management activities**. Forests affected by medium- and low-severity fires are still often used by spotted owls and should be managed accordingly. Many researchers supported the need to maintain habitat for spotted owl prey. For example, Lemkuhl et al. (2006) confirmed the importance of maintaining snags, downed wood, canopy cover, and mistletoe to support populations of spotted owl prey species. Gomez et al. (2005) noted the importance of fungal sporocarps which were positively associated with large, downed wood retained on site post-harvest. Carey et al. (1991) and Carey (1995) noted the importance of at least 10 to 15 percent cover of downed wood to benefit prey."[15]

Not enough information concerning the current status of the northern spotted owl has been gathered post-fire in the Klamath and southern Oregon Provinces. Prior to major wildfires across the region, *California's population of Northern spotted owls is likely a significant component of,*

[12] USDI, 2011 Revised Recovery Plan for the Northern Spotted Owl, at p. III-31.
[13] Id. at p. III-47.
[14] Id. at p. III-48.
[15] Id. at p. III-49 (emphasis added).

and source to the range-wide population.[16] The fires have significantly killed, harmed or displaced the species, and no one truly knows its current status. Compounding the problem is the presence of barred owl. The presence of barred owl is well documented to both impact northern spotted owl behavior (changing nesting location and foraging behavior) as well as to reduce the likelihood of detection from northern spotted owl surveys. Given this lack of information, the project should not be approved unless and until more information regarding the current status across its range, or at least the NSO Provinces of Southern Oregon and California, of northern spotted owl and the overall effects to Critical Habitat, in combination with LSRs and Riparian Reserves can be gathered.

Pacific Fisher

Systematic surveys have never been completed for a majority of Northern California. Their actual populations are unknown. Recent fires and over 300,000 acres of Northwest California National Forest Timber Sales (proposed and planned timber sales) in the last two years alone on top of thousands of acres of clearcut logging by private industrial timber corporations would likely cause extreme impacts to this species, its habitat and landscape connectivity, especially on isolated populations. And has likely caused more isolated populations. Please consider this new research on fishers[17].

Mixed-severity wildfire and salvage logging affect the populations of a forest-dependent carnivoran and a competitor. Abstract (emphasis added):

> Effects of historical fire suppression in forested ecosystems, combined with increasingly frequent
> and prolonged periods of drought due to a changing climate, are predicted to drive increases in the extent and intensity of wildfires in western North America and elsewhere. **Understanding the effects of wildfires on forest-dependent species and interactions among species is important for conservation and management decisions.** We used data collected from a long-term carnivore monitoring program in northern California and southern Oregon, USA to investigate the effects of three mixed-severity wildfires and salvage logging on a population of fishers (Pekania pennanti), forest-dependent carnivoran of conservation concern, and a co-occurring population of gray foxes (Urocyon cinereoargenteus), a competitor of similar body size. We developed a spatial capture-recapture population model to estimate the short-term effects of the wildfires and salvage logging on fisher and gray fox abundances, distributions, apparent survival and recruitment, and species interactions using non-invasive genetic data collected three years prior to and three years following wildfires. **Fisher abundance decreased significantly in areas of low-, medium-, and high-severity wildfire**. Gray fox abundance decreased

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[16] State Of California, Natural Resources Agency, Department of Fish and Wildlife Report to the Fish and Game Commission *A Status Review of The Northern Spotted Owl (Strix occidentalis caurina) in California.* 2016.

[17] *Green, D. S., M. E. Martin, R. A. Powell, E. L. McGregor, M. W. Gabriel, K. L. Pilgrim, M. K. Schwartz, andS. M. Matthews. 2022. Mixed-severity wildfire and salvage logging affect the populations of a forest-dependent carnivoran and a competitor. Ecosphere 13(1):e03877. 10.1002/ecs2.3877*

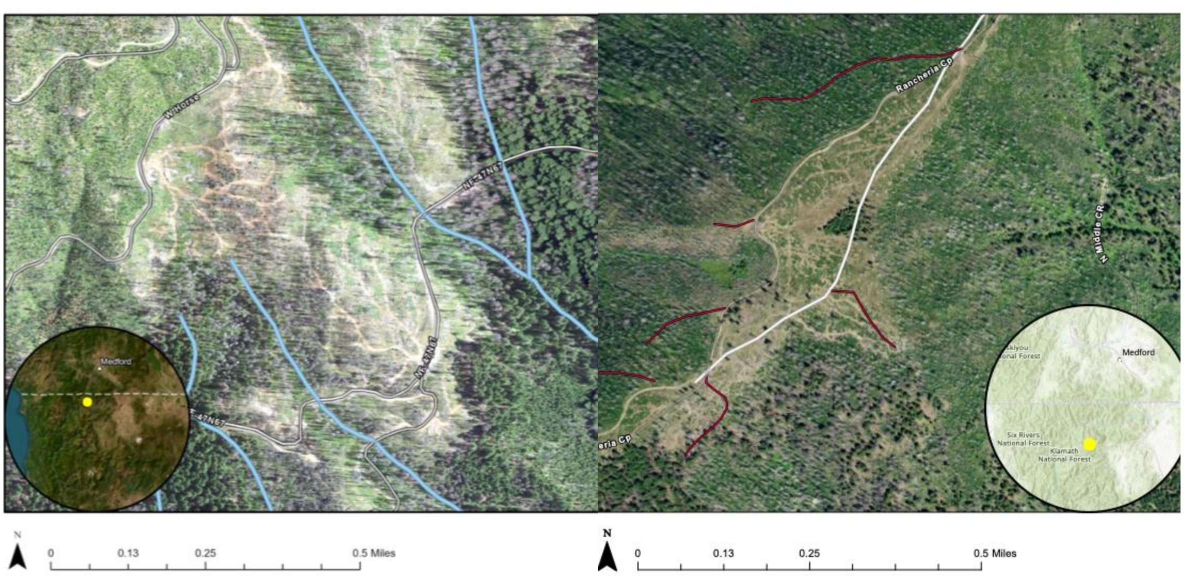
in the years before the wildfires, but rebounded in subsequent years. Medium-severity wildfire had a negative effect on gray fox density, but high-severity wildfire and fisher density had positive effects on gray fox density. **Salvage logging had negative effects on both fisher and gray fox density.** Our results suggest that increased severity, extent, and frequency of wildfires in the western USA will affect fisher populations negatively and alter the composition of mesocarnivoran communities.

Long-term Effects of "Salvage" Logging

To echo previous concerns on the long-lasting effects of "salvage" timber sales and subsequent skid trails, temp roads, soil damage and failure to follow standards and guidelines we provide you with a few satellite images of past timber sales on the Klamath National Forest.

Seiad Horse 2018 Horse Creek 2017

Seiad Horse Risk Reduction EA, 2018 **Westside Fire Recovery, 2015**



We appreciate your time and attention.

Sincerely,

Kimberly Baker
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Westside Fire Recovery, 2015