August 25, 2016

Forest Planner, Forest Plan Revision
USDA Forest Service, Region 5

Sent via: r5planrevision@fs.fed.us

Re: Comments on the Draft Environmental Impact Statement for Revision of the Inyo, Sequoia, and Sierra National Forests Land Management Plans

To the Forest Plan Revision Team:

These comments on the Draft Forest Plans and Draft Environmental Impact Statement for Revision of the Inyo, Sequoia, and Sierra National Forests Land Management Plans are submitted on behalf of the organizations noted below. Collectively, we have been engaged in the forest plan revision process for these three national forests since initiated in 2012. Many of our organizations also have a long history of engagement in forest planning beginning with the first plans adopted in the late 1980s to early 1990s for national forests in the Sierra Nevada. We have embraced the new Planning Rule and taken seriously its invitation to provide feedback early in the process and throughout the development of the revised plans.

We remain committed to working with your agency to develop revised forest plans that protect sensitive resources, provide for ecological integrity, and provide high quality recreational experiences. Our detailed review of the draft plans and DEIS indicate that there are significant gaps in assessment, development of plan components and evaluation of environmental consequences that preclude a meaningful analysis of the effects of the draft plans and alternatives on the environment. We ask that you revise the draft plans and revise or supplement the DEIS and circulate these documents for a 90-day comment period.

Please contact Susan Britting (530-295-8210; britting@earthlink.net) if you have questions about these comments.

Sincerely,

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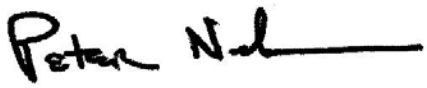

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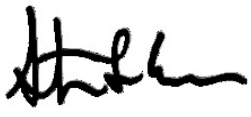

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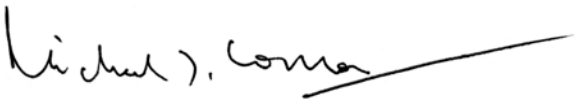

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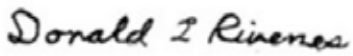

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I. Major Themes and Issues

A. The DEIS is Inadequate and Must be Revised.

NEPA is designed to foster informed and transparent decision-making. *See* 40 C.F.R. § 1500.1; *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). To achieve its "primary purpose" of "allow[ing] for informed public participation and informed decision making," the language of an EIS must be "clear" and "supported by evidence that the agency has made the necessary environmental analyses." *Earth Island Inst. v. U.S. Forest Service*, 442 F.3d 1147, 1160 (9th Cir. 2006); *accord* 40 C.F.R. § 1502.1. More broadly, NEPA requires the Forest Service to "[e]ncourage and facilitate public involvement in decisions which affect the quality of the human environment." 40 C.F.R. § 1500.2(d). "[B]y focusing Government and public attention on the environmental effects of proposed agency action . . . , NEPA ensures that the agency will not act on incomplete information, only to regret its decision after it is too late to correct." *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 371 (1989). Thus, an EIS must "be written in plain language" and presented in a way that "the public can readily understand." 40 C.F.R. § 1502.8; *see also Or. Envtl. Council v. Kunzman*, 817 F.2d 484, 493 (9th Cir. 1987) ("an EIS must be organized and written so as to be readily understandable by governmental decisionmakers and by interested non-professional laypersons likely to be affected by actions taken under the EIS"). "The information must be of high quality" because "[a]ccurate scientific analysis . . . and public scrutiny are essential to implementing NEPA." 40 C.F.R. § 1500.1(b).

In responding to public comments on a DEIS, the Forest Service may: (1) "[m]odify alternatives including the proposed action;" (2) "[d]evelop and evaluate alternatives not previously given serious consideration by the agency;" (3) "[s]upplement, improve, or modify its analyses;" (4) "[m]ake factual corrections;" or (5) "[e]xplain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the agency's position." 40 C.F.R. § 1503.4(a). "If changes in response to comments are minor and are confined to the responses described in paragraphs (a)(4) and (5) of this section, agencies may write them on errata sheets and attach them to the statement instead of rewriting the draft statement." 40 C.F.R. § 1503.4(c). Conversely, non-minor changes that require modified or new alternatives or analyses generally require revision or supplementation of the DEIS. *See* 40 C.F.R. §§ 1503.4, 1502.9(a) & (c).

"If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion." 40 C.F.R. § 1502.9(a). The Forest Service is required to prepare a supplemental DEIS if it "makes substantial changes in the proposed action that are relevant to environmental concerns," or "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c). In either case, the agency must seek public comment on the revised or supplemental DEIS. *See* 40 C.F.R. §§ 1502.9(a) & (c)(4), 1503.1(a)(4); *see also California v. Block*, 690 F.2d 753, 771 (9th Cir. 1982) ("Only at the stage when the draft EIS is circulated can the public and outside agencies have the opportunity to analyze a proposal and submit comment. No such right exists upon issuance of a final EIS.").

An EIS that fails to enable meaningful public review and understanding of the agency's proposal, methodology, and analysis of environmental consequences violates NEPA. *See, e.g., California ex rel. Lockyer v. U.S. Forest Serv.*, 465 F. Supp. 2d 942, 948-50 (N.D. Cal. 2006) ("incomprehensible" national monument management plan and corresponding EIS violated NEPA where it contained conflicting and confusing statements regarding applicable standards for management). The draft plans and DEIS for the Inyo, Sierra, and Sequoia National Forests suffer from numerous gaps in information and analysis that seriously frustrate public review and understanding. Certain highly significant issues that affect nearly all resources and aspects of forest management, such as widespread tree mortality on the Sierra and Sequoia National Forests, are largely missing from the DEIS. Many other issues, such as sustainable recreation and species protection, are only partially addressed, with key elements of the draft plans and NEPA analysis missing, incomplete, inaccurate, inconsistent with the best available science, or otherwise inadequate. Our comments address these and numerous other serious deficiencies in detail below. The significant and numerous information and analytical gaps render the DEIS "so inadequate as to preclude meaningful analysis" and review by the public, and therefore necessitate a revised DEIS. *See* 40 C.F.R. § 1502.9(a). Alternatively, the agency will need to prepare a supplemental DEIS to address the "substantial changes" that must be made to the draft plans to comply with the National Forest Management Act and the 2012 planning rule and to integrate the "significant new information" that we and other members of the public have raised in our comments. *See* 40 C.F.R. § 1502.9(c).

In addition to facilitating meaningful public engagement, NEPA requires that an EIS analyze a range of reasonable alternatives. The analysis of alternatives is the "heart" of an EIS. 40 C.F.R. § 1502.14. An agency must "[r]igorously explore and objectively evaluate all reasonable alternatives" to a proposed action. 40 C.F.R. § 1502.14(a); *see also* 42 U.S.C. § 4332(2)(E) (agencies must "study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources"). Consistent with NEPA's basic policy objective to protect the environment, this includes more environmentally protective alternatives. 40 C.F.R. § 1500.2(e) (agencies must "[u]se the NEPA process to identify and assess reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment"); *see also, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1121-22 (9th Cir. 2002) (citing cases), *abrogated on other grounds by The Wilderness Soc'y v. U.S. Forest Serv.*, 630 F.3d 1173, 1178-80 (9th Cir. 2011) (en banc). It also includes reasonable alternatives submitted by the public at scoping. *See* 40 C.F.R. §§ 1501.7, 1502.1. "The existence of a viable but unexamined alternative renders an [EIS] inadequate." *Mont. Wilderness Ass'n v. Connell*, 725 F.3d 988, 1004 (9th Cir. 2013) (quotations and citation omitted). The "touchstone" of the inquiry is "whether an EIS's selection and discussion of alternatives fosters informed decision-making and informed public participation." *Mont. Wilderness Ass'n*, 725 F.3d at 1005 (quotations and citation omitted).

The DEIS range of alternatives is inadequate in a number of respects. In many instances, the DEIS fails to analyze reasonable alternatives and proposals submitted by the public at scoping. This includes but is not limited to reasonable and well-supported proposals and recommendations for critical aquatic refuges, recommended wilderness, improvements to meadow management and grazing, fuel treatments to meet established fuel objectives (e.g.,

allowing mechanical thinning of small diameter material), protective management of inventoried roadless areas, meaningful direction on making the forest road system more ecologically and fiscally sustainable, and consideration of other special designations beyond recommended wilderness and eligible Wild & Scenic Rivers. In other instances, the range of alternatives is otherwise inadequate to facilitate informed decision-making and public involvement. For instance, the range of alternatives for recommended wilderness fails to include the upper end of the range (between 52 and 100 percent of the inventoried acreage that may be suitable for inclusion in the National Wilderness Preservation System) and intermediate alternatives (between 2.5 and 51 percent of the inventoried acreage). Each of these examples and others are addressed in detail in the comments below. Importantly, the new and revised alternatives that will be necessary to remedy these significant gaps will not be "minor variation[s]" of the existing alternatives that are "qualitatively within the spectrum of alternatives that were discussed in the draft." *Forty Most Asked Questions Concerning CEQ's NEPA Regulations*, 46 Fed. Reg. 18,026, 1,035 (Mar. 17, 1981). Here too, a revised (or, in the alternative, a supplemental) DEIS will be necessary.

Finally, NEPA dictates that the Forest Service take a "hard look" at the environmental consequences of a proposed action, including its direct, indirect, and cumulative effects. *Robertson*, 490 U.S. at 348; 42 U.S.C. § 4332(2)(C); 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. The required hard look encompasses effects that are "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative." 40 C.F.R. § 1508.8. The numerous and significant gaps in information, analysis, and alternatives renders the DEIS impacts analysis invalid. For instance, absent information about significant and ongoing tree mortality, the forests' ecologically and fiscally unsustainable road system, and other important baseline conditions integrated into the environmental baseline and each of the alternatives, the DEIS fails to take the required hard look at impacts. As the Ninth Circuit has explained, "without establishing the baseline conditions . . . , there is simply no way to determine what effect the proposed [action] will have on the environment and, consequently, no way to comply with NEPA." *Half Moon Bay Fisherman's Marketing Ass'n v Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988). Many other elements of the impacts analysis are incomplete, unsupported by the best available science, or otherwise inadequate, as explained in detail in our comments below. The deficient impacts analysis likewise renders the DEIS so inadequate as to preclude meaningful review. A revised DEIS is required. In the alternative, a supplemental DEIS is necessary.

B. The Draft Plans are Inadequate and Must be Revised.

The National Forest Management Act (NFMA), 16 U.S.C. § 1600 *et seq.*, provides the governing framework and legal requirements for forest planning. Among other requirements, NFMA requires that plans provide for multiple use, including outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness, and "provide for diversity of plant and animal communities." 16 U.S.C. § 1604(e)(1), (g)(3)(B). NFMA requires promulgation of regulations that provide binding direction on development and revision of plans. The 2012 planning rule, 36 C.F.R. part 219, in turn imposes a series of mandatory procedural and substantive requirements, which are described in detail throughout these comments. Examples include identifying and

evaluating lands that may be suitable for inclusion in the National Wilderness Preservation System and determining whether to recommend any such areas for wilderness designation, identifying species of conservation concern and prescribing standards or guidelines to maintain viable populations of each within the plan area, and using and documenting the best available scientific information to inform the planning process. 36 C.F.R. §§ 219.3, 219.7(c)(2)(v), 219.9. Ensuring that plans satisfy the requirements of NFMA and the planning rule is of critical importance, as forest plans provide the governing blue-print for forest management for the next 10-15 years, and all projects and activities must be consistent with the governing plan. 16 U.S.C. § 1604(i); 36 C.F.R. § 219.15.

Unfortunately, the draft plans for the Inyo, Sierra, and Sequoia fall well short of satisfying the requirements of NFMA and the 2012 planning rule. While the draft plans suffer from a number of deficiencies, one of the more egregious examples is their failure to provide for the viability of at-risk species. For instance, a number of species for which the best available scientific information clearly indicates substantial concern for their capability to persist over the long-term in the plan area, *see* 36 C.F.R. § 219.9(c), were not identified as species of conservation concern. These include northern goshawk, black-backed woodpecker, and others. Course-scale ecosystem plan components have very few standards or guidelines, and the draft plans contain very few fine-scale, species-specific components. *See* 36 C.F.R. § 219.9(a) & (b). The few species-specific standards and guidelines in the draft plans generally lack specificity, often include significant loopholes, and/or defer to project-level decision-making. With respect to each of these deficiencies, draft plan direction for at-risk species runs counter to the best available scientific information.

Other elements of the draft plans are entirely missing. For example, the draft plans fail to consider new administratively designated areas beyond eligible wild and scenic rivers and recommended wilderness, despite a planning rule requirement to do so. 36 C.F.R. § 219.7(c)(2)(vii). The requirement to consider special designations and determine whether to recommend additional designated areas is just one of the non-discretionary duties enumerated in section 219.7(c)(2) of the planning rule, which include determining whether to recommend areas found suitable for inclusion in the National Wilderness Preservation System, identifying the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System, and identifying the maximum quantity of timber that may be removed from the planning area.

These and other deficiencies are discussed in detail in the comments below. Because the draft plans are inadequate in a number of respects and fail to comply with requirements of NFMA and the 2012 planning rule, they must be revised and new drafts must be released for public review and comment.

C. Recent and Ongoing Tree Mortality

California has experienced drought in the last five years of a magnitude unsurpassed by any seen in contemporary times (Asner et al. 2016). The changes to the landscape in the southern Sierra Nevada provoked by the drought have been rapid and are still ongoing (USDA Forest Service 2016b). High levels of tree mortality of pine species have been the most obvious change on the Sequoia and Sierra national forests. It is also known that this mortality event is not yet over,

since the beetles utilizing the drought-affected trees remain at epidemic levels and the drought conditions still exist (although less extreme than the last two years).[1]

The consequences of this change on the landscape are broad and impact all forest resources, including recreational uses, commerce, public safety along roads, alterations in forest structure and composition, and the capacity of the forest to produce timber in the coming two decades. These changes create a new baseline for the environment that is drastically different than the one portrayed in the DEIS. This new baseline needs to be addressed to satisfy the agency's obligations under the National Forest Management Act. The new baseline also affects the development of the draft plans since they are to be based on forest assessments that "evaluate existing information about relevant ecological, economic, and social conditions, trends, and sustainability and their relationship to the land management plan within the context of the broader landscape." 36 C.F.R. § 219.5. In the detailed comments below, we identify specific resource areas affected by the ongoing tree mortality that were not adequately addressed in the draft plans or in the DEIS. These include terrestrial ecosystems, wildlife, sustainable recreation, roads, and timber suitability.

D. "Flexible Forest Plans" Lead to Unacceptable Uncertainty

The draft plan properly describes the planning framework (e.g., Sierra draft plan, p. 6). It is this framework of assessment, planning, monitoring and then plan amendment or revision that "creates a responsive planning *process*" and "allows the Forest Service to adapt to changing conditions" (219.6(a). The purpose of monitoring in an adaptive management framework is correctly described as "to facilitate learning to support decisions on necessary *changes* to the plan" (e.g., Sierra draft plan, p. 7).

However, there is nothing in the Planning Rule that provides authority to "establish a flexible *forest plan*" (DEIS, p. 6) by building uncertainty into the plan components themselves. Doing so would provide the Forest Service with the ability to essentially change or create plan direction in the future without public involvement. This attempt to provide maximum discretion to future decision-makers on a project-by-project basis would be counter to the purpose of NFMA to provide integrated and strategic direction for future projects, and it would bypass the requirements of the planning rule which explicitly do not apply to projects (36 C.F.R. 2192(c)). In the case of at-risk species, it would allow the Forest Service to avoid its statutory obligation for *forest plans* to provide for diversity of plant and animal communities.

The DEIS explicitly and frequently criticizes the lack of flexibility in existing plans imposed by standards to protect at-risk species. For example (DEIS, p. 171):

> On most of the landscape, there is limited flexibility to restore composition and structure because of management direction for the California spotted owl that emphasizes retaining tree cover. The treatments in these forest types are usually low intensity due to restrictions on the amount of canopy cover that can be reduced.

[1] http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd509278.pdf

The preferred alternative would create more flexibility by removing protective standards, and relying instead on desired conditions, indicating that the Forest Service understands that desired conditions are more flexible and less protective than standards. The DEIS acknowledges that this same flexibility produces greater short-term risk to these species (see DEIS, p. 364). Yet the Forest Service insists, without any scientific support, that such flexibility is better for at-risk species than protective requirements.

The wildlife effects analysis acknowledges that it does not attempt to consider short-term impacts. "The magnitude of these impacts would be the subject of project-specific analyses and are beyond the scope of this programmatic analysis"(DEIS, p. 375). For years, the Forest Service has been avoiding addressing broad-scale effects during project analysis by saying that they are "beyond the scope" of that analysis. Now that it is time to consider those effects at the forest plan level, the buck is being passed back to the project level; the ultimate shell game. NEPA requires that the effects of removing plan standards to increase flexibility for projects must be addressed at the plan level.

The rationale behind providing flexibility may be revealed by this statement: "Alternative A would provide a low level of long-term connectivity for forest-dependent species (lower than alternatives B and D) because it is the least flexible management approach in addressing rapidly changing climate conditions that could lead to the large-scale loss of contiguous areas of forested habitat" (DEIS, p. 370). This analysis evidently views climate change as something that will happen so quickly that the adaptive framework adopted in the planning rule will not allow plans to be amended quickly enough to respond to climate change. This is squarely contrary to the language of the planning rule, which mentions climate change as a reason for its adaptive framework.

The revised forest plans would include many new desired conditions, but these do not provide the certainty of designated standards. The requirement for consistency with desired conditions is inherently much more flexible. Many of the plan components listed as "desired conditions" do not describe the desired conditions and instead suggest that desired conditions will be defined at a later time. This is often done, especially for aquatic resources, by adopting the natural range of variation (NRV) as the desired condition, without specifying what the NRV is or how it would be determined.

Notably, an actual desired condition would have to be determined for the first project signed after the revised plan is adopted; what additional information would be available then that cannot be used in developing the forest plan? In addition, once a desired condition is determined, the plan will have to be amended because this desired condition would apply to all future projects. Moreover, simply establishing "NRV" as the desired condition for ecosystems or species would merely restate the legal requirement in the Planning Rule. This is not planning at all; putting off programmatic decisions until projects are proposed is not in compliance with NFMA.

Desired conditions are vague in many other ways. WTR-FW-DC-01 establishes the desired condition of quantity and timing of water flows as those that are "adequate" for diversity (Sierra draft plan, p. 11). This again merely repeats the legal requirement, while providing no guidance or certainty that it would be achieved. It also requires that watershed resilience be "sustained or

maintained or restored." The choice would appear to be based on whether current conditions match desired conditions, but there are no desired conditions specified (other than "resilience," which is again simply a requirement of the Planning Rule through the definition of "ecological integrity" (36 C.F.R.219.19)). Similarly WTR-FW-DC-02 repeats the Rule's requirement for aquatic integrity (Id.). The plan should establish what integrity means to these watersheds (as written, it could apply to any national forest). WTR-FW-DC-03 introduces the concept of "fully functioning condition" as what is desired, but does not define what that would be or how it could be measured or determined. As an extreme example of circular (or dead-end) direction, MA-RCA-DC-02 is a desired condition "to provide desired habitat conditions and ecological functions" (Id.)

The entire set of desired conditions for watersheds provides no means to judge whether they have been met except for the opinion of the Forest Service. It amounts to a blank check – unless the void is filled by other kinds of plan components. Weak desired conditions create a need for stronger standards and guidelines. Tellingly, MA-RCA-GDL-01 requires a determination of whether "relevant stream characteristics are within the range of natural variation" prior to any project activity (Sierra draft plan, p. 63). Determining NRV at the project level circumvents the entire NFMA diversity framework. NRV need only be determined once, and that should be in the forest planning process. (The plan should also determine which stream characteristics are "relevant"). In addition, treating NRV as a guideline violates the requirement that projects must be consistent with the desired conditions.

There is a requirement that plan components be informed by the best available scientific information (36 C.F.R. 219.3), but there is no evidence of any scientific information in the aquatic desired conditions. Moreover, the requirement for use of best available science in the Planning Rule explicitly does not apply to project planning, where the actual desired conditions would evidently be determined. This approach to "planning" on a project by project basis essentially circumvents the NFMA science requirements.

The terrestrial section also includes some content-free "desired conditions." For example, TERR-FW-DC-01 restates the requirements for ecosystem integrity and diversity, TERR-FW-DC-03 restates the requirements for at-risk species, and TERR-FW-DC-04 restates the requirement for connectivity (Sierra draft plan, p. 13). However, in other instances, there are desired conditions that elaborate on these goals and are more specific. For example, desired conditions for ponderosa pine include detailed descriptions of desired conditions for tree density, opening size, shrub cover, quantity of decadent shrubs, fuel loading, snags and woody debris, as well as tree canopy cover and age (some by vegetation type/zone) (Sierra draft plan, pp. 18-19). On the other hand, the desired conditions for aspen simply restate the requirement for NRV (Sierra draft plan, p. 31).

The plan does not identify where the desired conditions for "special habitat" would apply. It includes examples, but the plan must be explicit by providing either maps or criteria that would be applied. This section also alludes to "species with a specific geographic or other restricted distribution," but does not identify which species those are (same for SPEC-FW-DC-03) (Sierra draft plan, p. 32).

The proposed plan is rife with subjective terms for desired conditions: adequate, sufficient, resilient, healthy, sustainable, natural, ample, typically, satisfactory, necessary, properly. The failure to include objective measurable conditions means that the public has no idea what the Forest Service is planning, or what the effects will be. There are also many other undefined terms (including unidentified areas). This leaves the meaning up to the whims of the individual future decision-makers. This is not planning as intended by NFMA.

Such desired conditions also do not meet the requirement that they be specific enough to allow progress toward their achievement to be determined (36 C.F.R. 219.7(e)(1)). At best they are goals (which are optional). For at-risk species, the lack of desired conditions that describe the ecological conditions that are necessary for viable populations of the species, and that are scientifically supported, would result in violating NFMA's diversity requirement.

Another way that the Forest Service is increasing flexibility is by avoiding actually making decisions at the plan level through the extensive use of "potential management approaches." The planning rule authorizes the use of potential management approaches, but because these are not plan components, future activities do not have to be consistent with them. Many are written as if they should be plan components, and there is no rationale provided for why they are not. The result is a confusing mishmash of what the plan requires and what is entirely optional. Some of the potential management approaches may need to be plan components in order to meet the requirements for plan components to provide for diversity. And notably, the analysis of effects in the DEIS generally presents the potential management approaches as something assumed to be done.

Perhaps the most egregious strategy to provide flexibility is the creation of "floating" management areas, which can be placed anywhere on the forest (or not) any time (or not) during the life of the plan. According to the DEIS, focus landscapes are "areas that have different suites of standards and guides in them…The plan direction for these species in the focus landscapes is less restrictive…"(DEIS, pp. 175-6). This meets the definition in the planning rule of "management area." But the plans do not actually designate any areas where this direction would apply (contrary to FSH 1909.12 22.2). Moreover, the "less restrictive" designation means that it is really a blanket exception to plan components that would otherwise protect at-risk species, and the exception may be applied outside of the forest planning process. In fact, it would require a plan amendment to designate the location for a focus landscape.

"In alternative B, the greatest flexibility is in the focus landscapes, where there would be more flexibility to evaluate the response of Pacific fisher and California spotted owl to restoration of vegetation to the natural range of variation. This adaptive process that is inherent in the new planning rule provides greater potential for alternative B to monitor, learn, and adapt to rapidly changing climate" (DEIS, p. 260). If the intent is that focus landscapes serve as adaptive management study areas, they must be identified at this time as not suitable for timber production because a sustained yield of timber volume cannot be predicted (FSH 1909.12 61.2).

These decisions to increase "flexibility" all contribute to a DEIS that fails to adequately inform the decision-maker and the public about the likely consequences of the alternatives. The DEIS does not provide enough information about what kinds of activities the plan would allow, or

where they would occur. It also does not properly disclose the environmental effects of the revised plan. Where the plan does not limit effects through explicit plan standards and guidelines, the DEIS must disclose the worst possible effects that would be allowed by the plan. Instead the DEIS relies on an unverified assumption that flexibility, by itself, is inherently good for at-risk species. This does not comply with NEPA.

E. Management Areas Not Properly Identified in Draft Plans and Not Analyzed in DEIS

The draft plans identify management areas in Chapter 3 of each plan as a component of the management strategy. This area is defined in each plan as:

> **Management area** is land area identified within the planning area that has the same set of applicable plan components. A management area does not have to be spatially contiguous.

(e.g., Sierra draft plan, p. 166). This is the same definition provided in the Planning Rule. 36 C.F.R. § 219.19. The same seven "management areas" are identified for each draft plan along with additional "designated areas" that vary among the draft forest plans. The management areas provide a focus and help to set priorities for defined areas. Critical aquatic refuges and riparian management areas have been identified as management areas in each forest plan with specific plan components associated with these areas wherever they occur across the plan area.

1. Management Areas Missing from the Draft Plans

There are additional management areas similar to those noted above that have not been identified in the draft plans, yet should be. These areas include protected activity centers for California spotted owls and great gray owls, home range core areas for California spotted owl, marten core habitat, community buffers, focus landscapes, recreational opportunity spectrum, and scenic integrity objective. Each of these areas has specific management direction, including desired conditions, standards and guidelines, associated with the area that has been defined. We ask that you include these as management areas and revise the draft plans to reflect this.

2. Relationship Among Overlapping Management Areas Is Not Always Clear

Among the proposed management areas, the relationship between the various plan components is not always clear. For instance, recreation places cumulatively cover the all lands in a plan area. The same is true for the strategic fire management zones. Riparian conservation areas and critical aquatic refuges overlap in certain locations with these two zones. The draft plans do not address the overlapping nature of the management areas and do not set priorities among management areas. This lack of clarity seriously frustrates any review of the plan since the desired conditions and priorities for action and management cannot be determined for a given location. We also believe that an interdisciplinary team attempting to implement the plan and asked to determine the actions that are appropriate in a given location would be thwarted from doing so.

There are many approaches that can be used to convey the relationship among management areas, e.g., matrices, tables, and maps combining management areas. These have been used in planning processes in the past (e.g., USDA Forest Service 2001a and 2004) and should be used to clarify these draft plans.

3. Spatial Locations of Discretionary Management Areas Are Required to Evaluate Impacts from Allowable Uses and Maintain Species Viability

Focus landscapes and community buffers are management areas identified in the draft forest plans, but are not mapped. When these areas overlap with areas designed to protect at-risk species, e.g., a protected activity center for California spotted owl, plan components associated with the conservation areas are waived or significantly reduced. Such impacts on at-risk species are generally discussed, but the environmental cost-benefit to the species is not evaluated in any meaningful way in part because the focus landscapes have not been identified on the ground. By contrast, one can examine the fire management zones and assess any actions in those zones in relation to conservation areas identified for at-risk species.

Species-specific plan components are developed when it has been determined that the ecosystem components do not provide the necessary ecological conditions to maintain viable populations of the SCCs. 36 C.F.R. § 219.9(b) Because many species-specific plan components do not apply within focus landscapes and the number of and locations of focus landscapes are entirely discretionary, it must be assumed that the species-specific plan components in question will never be implemented. Therefore, it is logical to conclude that the plans do not maintain the viability of the at-risk species in question because many of the plan components developed to maintain species viability are as discretionary as the number and locations of the focus landscapes.

We ask that these areas be mapped and that the DEIS estimate the effect of the type of actions allowed in these management areas on the affected resources.

F. Documentation and Use of Best Available Science Information

The 2012 Planning Rule requires responsible officials to use the best available scientific information to inform the planning process. This requires two things (36 CFR 219.3):

- The responsible official "shall determine what information is the most accurate, reliable, and relevant to the issues being considered" (the definition of "best available"), and document the "basis for that determination."
- The responsible official "shall document how the best available scientific information was used to inform the assessment, the plan decision, and the monitoring program as required in §§ 219.6(a)(3) and 219.14(a)(4)," by explaining how "the information was applied to the issues considered."

The Planning Rule does not specify where this must be documented. The DEIS states that, "During development of the environmental analyses that follow, the planning team used the best

available scientific information, which is documented in the planning record" (DEIS, p. 55). It is not clear what document or documents this statement refers to, but there is a supplemental report document labeled "Best Available Scientific Information Summary Tables" that sounds like it should contain all of the necessary information.

In fact, while the table does specifically reference the Planning Rule language ("How the best available scientific information informed the planning process"), it does not explain "how" the information was applied to any issues associated with the planning process or monitoring. The table lists references for all of the "resource areas." However, the table only indicates if the source was used to inform the planning process (indicated by a "P"), or monitoring ("M"). Equally important, it does not provide the rationale for how or why that information was determined to be the best to apply to such issues. This document fails to meet the requirements of the Planning Rule.

NEPA has its own requirements for scientific integrity of the discussions and analysis in environmental impact statements, including a requirement for documentation of references to sources relied upon for conclusions in the EIS (40 CFR 1508.24). The DEIS is full of conclusory statements without any analytical or scientific support. There are also many vague references to "best available scientific information." While the DEIS does sometimes assert that particular documents represent "the best available scientific information" (see for example, DEIS, p. 161, regarding natural range of variation), that would only partially comply with the requirements in the Planning Rule. The DEIS also refers to supporting documents for a "more detailed discussion of the best available science." One such cited report, Vegetation Ecology (DEIS, p. 163), includes scientific information but contains no discussion of "best available scientific information"or the type of analysis required by NEPA.

Thus there is no documentation of how the draft EIS and plan use the best available scientific information. As so much weight has been given to the supposed scientific rationale for active restoration in sensitive habitats, yet there is so much uncertainty about the effects of management actions on at-risk species, this is especially inexcusable. However, we appreciate that a science consistency review is ongoing, and expect that the results of that review will be documented in a way that demonstrates compliance with the Planning Rule's science requirements.

II. Terrestrial Ecosystems

Terrestrial ecosystem types make up the vast majority of the landscape within the plan areas. This type, in association with the aquatic and riparian ecosystems, provides the ecological foundation for the plan areas. Plan development and the analysis for the DEIS was prepared over the past two years and largely is based on vegetative conditions from 2013 or prior years. However, significant amounts of tree mortality have occurred in the past two years on the Sierra and Sequoia national forests as a result of drought. The analysis provided in the DEIS fails to take into account the magnitude of this change to the existing condition of the landscape. As a result, the draft plans fail to address the unique landscape setting that the drought event has created.

Below we describe various issues with the components in the draft plans and the analysis provided in the DEIS. These issues in addition to the unique existing condition of the landscape, one that has never been experienced in contemporary times, should be addressed in revised draft plans and a revised DEIS.

A. Fire: Beneficial Disturbance Process or Threat?

The draft plans and analyses are focused almost single mindedly on the potential impacts from wildfire. Assumptions about the amount of "treatment" required to curb large and severe fires were used as a basis to develop the plans themselves and influenced the analysis in the DEIS in significant ways. Fire and the resulting changes to the ecosystem are also identified as beneficial and important to ecological integrity and sustainability, yet these benefits are far overshadowed by the emphasis on the "threat" of wildfire. For instance, we see in the fire risk analysis that the benefits of fire are limited to habitat for a few species with little attention paid to the societal or economic benefits of using fire to increase the resilience of the landscape. Managed and prescribed fire are both less costly than logging (the tool emphasized in Alternative B) and can improve smoke management (Schweizer and Cisneros 2016) and improve resilience in ways that are not possible with logging. We also see that the benefits to wildlife and the positive and necessary benefits that post-fire landscapes contribute to ecological integrity and diversity are overwhelmed by the desire for "salvage of dead and dying trees" to capture "as much of the economic value and carbon storage capacity of the wood as possible." This framing overlooks the ecological dependence of this ecosystem on wildfire for renewal and regeneration that supports the plant and habitat diversity expected under the natural range of variability.

The setting is further complicated by the analysis prepared by Westerling et al. (2015a and b). One of the main conclusions from this analysis is that the amount of area expected to be affected by wildfire is unacceptably high and that "treatment" can reduce the affected area. This is, however, not consistent with other perspectives in the science community that increasing the extent and frequency of wildlife in more moderate conditions will have a beneficial effect on the forest ecosystem. A "bad" (undesirable) outcome in the Westerling analysis is one that results in an increase in the annual acres burned of any intensity or extent. For instance, the annual area burned during an historic period (1961-1991) is used as a threshold to measure the performance of the several "treatments" under various climate scenarios projected into the future. The annual area burned in the historic setting is about 24,000 acres for the three forests combined (Westerling et al. 2015a, Table 5). These plan areas cover about 4.47 million acres and have a variety of plant community types with specific fire return intervals. A review of those forest types and fire return intervals indicates that for the three national forest combined we would expect the annual area burned under a natural fire regime would be about 150,000 acres burned per year – five times the value used by Westerling to judge an outcome from "treatment" to be good.[2] Aside from the analysis implications that we will discuss in a following section, the basic framing in Westerling et al. is at cross purposes with the desired condition to reestablish a natural fire regime on this landscape. This is emphasized by the assumption in the Westerling et al. analysis that fires greater than 1,000 acres are to be avoided and actions that reduce this amount to less than 20 percent of the annual area burned expected under the natural range of variability will result in the desired condition.

[2] See Exhibit II.1 for an estimate of annual area burned by national forest and vegetation type.

Because fire is an essential process in this fire-dependent landscape and intimately tied to providing for ecological integrity (North et al. 2015), the draft plans and environmental analysis need to redirect the management emphasis to increased use of fire under conditions that are moderate, evaluate the capacity for each alternative to accomplish this, and evaluate the incremental benefits of doing so over time. In reality, none of the alternatives will result in increased use of managed or prescribed fire compared to current levels (which in fact are far lower than reported for Alternative A), unless the plans direct this outcome and funding is directed to its accomplishment.

B. Assumptions in the Analysis Not Clearly Described

We appreciate that the DEIS applies a consistent format to presenting analysis assumptions and thresholds. This makes it much easier to follow the approach taken and the results presented. The DEIS and supplemental reports however lack sufficient detail on some of the assumptions to allow a reviewer to fully understand and comment on the assumptions or approach. We attempted early in the comment period to obtain the information from the Planning Team that was relied upon in the analysis. The information we requested ranged from GIS data to references cited in the DEIS and supplemental reports. We also requested a copy of the project file in an effort to streamline our request. Only a small fraction of the requested materials was provided to us as of the submission of these comments. We also requested to meet with the analysts responsible for preparing the information on fire and forest ecology, but our request to meet to discuss the methods and assumptions was denied by Al Olson, Director of Planning. These barriers to information access have significantly impeded our ability to review and comment on the DEIS and draft plans.

The potential impact of wildfire is central to the analysis in the DEIS and the criteria used to qualitatively judge the success of a given alternative. The DEIS uses two thresholds on which to base its analysis. First, the DEIS assumes that:

> High fire intensity in dry, hot conditions is expected to be reduced to moderate or low intensity or a mosaic of intensities when at least 40 percent of a landscape area is in a low or reduced fuel condition. A variety of landscape theory, fire modeling, and fire behavior case studies support this (Turner 1989, Parisien et al. 2008, 2010, 2012, Fites-Kaufman 2014, Coen et al. 2015). Based on this information, for this analysis we assume that at least 12,000 acres or more needs to have at least 40 percent of its area restored to result in changes in fire probability, extent, and large fire size. See Fire-Climate supplemental report for more detail (DEIS, p. 61).

We reviewed all but one of the studies cited above[3] and the Fire-Climate supplemental report. We do not find any information in these studies to support the assumption that at least 40 percent of a landscape needs to be "restored" to result in changes in fire probability, extent and large fire size. To the contrary, Westerling et al. (2015) found that all treatment scenarios resulted in

[3] The Forest Service did not provide the requested references; however, we were able to locate all but Coen et al. (2015). We note that this citation is to a "paper" presented at a conference. Typically the publication for such "papers" is limited to an abstract and details are generally limited.

reduced fire probability, extent and large fire size compared to untreated scenarios and that "Statistical experiments indicated that treating smaller areas than addressed by the fuels restoration scenarios might still potentially yield significant reductions in burned area, high severity burned area, and total particulate emissions (Tables 8 & 9)" (Westerling et al. 2016, p. 3). Furthermore, the basis for selecting the size "12,000 acres" is not supported by anything other than the belief, based on an observation from one fire, that "up to 6,000 acres of actively burning fire in one location at a time" indicates that "a minimum area to change large fire size is at least double or more that area" (Fire-Climate Supplemental Report 2016, p. 8).

We are also aware of numerous other studies which show that reducing fuels on 20 to 30 percent of a landscape can substantially reduce fire size and severity. For example, Dow et al. (2015) found that actual and modeled treatments on 19 percent of a 47,500 acre project area in the northern Sierra Nevada reduced the size of modeled fire by 36 to 43 percent depending on how the treatments were arranged and conditional burn probability was reduced by half for all treatments compared to control. The Sierra Nevada Adaptive Management project reported similar results for study areas in the central and southern Sierra Nevada (Fry et al. 2015). Treatment of 29 percent of one of the study areas, which included a 16 inch diameter limit for tree removal applied to a significant portion of the treatment area, reduced modeled fire size from 3,200 acres to about 123 acres and conditional burn probability was reduced by about half after treatment. These studies indicate that treating less of the landscape than 40 percent, and even with less intensive treatments, can effectively reduce fire risk.

Second, the DEIS (p. 142) assumes, based on results from Westerling et al (2015a) and the studies above by Parisien et al., that areas with more than 60 to 75 percent of the landscape "more consistent with the natural range of variation" will have a substantially reduced probability of fire. We have reviewed these studies and reports and find no clear basis of support for the statement that 60 to 75 percent of the landscape is an appropriate threshold. The Westerling et al. reports (2015a and 2015b) are particularly challenging to review since they do not meet the standards for a published paper, i.e., the methods are incompletely described, figure legends and figures not fully described, results only superficially described and no formal discussion of the results included. The study was also not peer reviewed. Westerling et al. (2015b) is even briefer than the former report with only an abstract from a presentation, some bullet points, sentence fragments, and some graphs.[4]

We are also concerned about the criteria used by Westerling et al. and the DEIS to characterize high severity fire. The DEIS and supplemental reports define high severity fire as "greater than 50 percent overstory mortality" (DEIS, Figure 7, p. 67). The science information cited extensively in the DEIS is based on a definition of high severity characterized by "90% of the tree canopy … directly consumed by fire or scorched by fire and died within the subsequent year" (Miller et al. 2009, p. 21). The liberal definition of high severity fire used in the DEIS

[4] We also have concerns about the methods used to characterize historic fires since the "FRCC" data selected for the time period 1961 to 1990 is based on a static data and does not account for the changes in vegetation that may have occurred during the period, whereas other data used in the model accounts for monthly variability. We also note that Parisien et al. (2012) found that fuels explained less than 25 percent of the variation in a similarly constructed fire probability model and when this variable was removed, the model performance was only slightly less. We believe these findings from other studies need to be address in the Westerling et al. reports.

undoubtedly results in portraying a more dire picture about the potential increase in high severity fire compared to the standard definitions established by the fire scientists who developed the methods to characterize this fire effect (Miller et al. 2007, Miller et al. 2009). We note that Westerling et al. (2015b) reports some analysis and results for two conditions for high severity fires – BA50 and BA90. It is possible that these acronyms refer to 50 percent and 90 percent of the canopy cover consumed, but it is not possible for us to verify this since the methods and results reported there are incomplete.

These reports and the inferences made from them in the DEIS should be reviewed by an independent third party. Furthermore, the science basis for these thresholds needs to be presented in the DEIS and more clearly explained. We also ask that the results from the studies cited above be addressed in a revised DEIS.

C. Assumptions in the DEIS Not Supported By the Draft Plans

The analysis in the DEIS assumes certain actions will occur under Alternative B, but there are no required plan components in the draft plans to support these assumptions. These unsupported assumptions are focused on the expected outcomes from logging and address the retention of large trees, retention of canopy cover, use of variable density thinning and the nature of group selection. However, none of the required plan components in the draft plans actually require the application of these assumptions during project planning or require that these assumptions be met for a project to be consistent with the forest plan. Several assumptions illustrate this; with respect to the removal of large trees, the DEIS states:

> The removal of large-diameter trees (greater than 30 inches in diameter) would be an exception…and considered as part of project-level planning and design. (DEIS, p. 377)
>
> Large trees would not be removed to favor the growth of much smaller trees. (DEIS, p. 377)
>
> Treatments would generally not reverse seral stage development (that is, convert late-seral to mid-or early-seral stands by removing large and old trees). (DEIS, p. 377)
>
> Manage for desired densities [in reference to] large tree direction (DEIS, Table 61, p. 233)
>
> The removal of older and very large trees (greater than 35 inches diameter at breast height) would not occur, except in rare instances where human safety is imminently threatened (FIRE-FW-GDL 09; SPEC-FW-GDL-01) (DEIS, p. 233)

Despite the claims in the DEIS, the only standard that limits the removal of large trees is:

> TERR-FW-STD 01
> For mechanical thinning harvests specifically designed to treat fuels, and/or control stand densities, within the wildfire restoration and maintenance zones, retain all live conifer trees 30 inches in diameter or larger, except to meet the needs for equipment operability. (e.g., Sierra draft plan, p. 91)

This standard allows an exception to the standard on about 1 million acres in the planning area and for treatments other than those designed to treat fuels or stand density. Since there are no standards or guidelines that otherwise limit the removal of large trees, the impacts of logging are likely underestimated. This is especially important to correct since there are competing plan components, e.g., a timber volume set by TIMB-FW-OBJ 01, and recognition that timber production as a primary or secondary objective on many lands (e.g., Sierra draft pan, p. 153 "Timber production is a desired primary or secondary use of the land") that could drive the removal of more volume.

With respect to canopy cover, the DEIS assumes that "Canopy may be opened by removing individual trees but canopy cover would not drop below median values for vegetation types (dry and moist)" (DEIS, p. 377). There are no required plan components that state this requirement to not drop below median values. The only standard or guideline that mentions retaining canopy identifies retaining "some overtopping and multi-storied canopy conditions" within the California spotted owl home range core areas, fisher strategy areas and marten core habitat areas (e.g., Sierra draft plan, SPEC-CSO-PF-SM-GDL 01, p. 98) with no reference to desired conditions or median values. Unless there are specific, quantitative standards or guidelines to require the retention of canopy, a project will be deemed consistent with the desired condition as long as it:

…contributes to the maintenance or attainment of one or more goals, desired conditions, or objectives, **or does not foreclose the opportunity to maintain or achieve any goals, desired conditions, or objectives, over the long term** (emphasis added, 36 CFR 219.15(d)(1))

Not "foreclosing the opportunity" over the long term is a very low bar to be met at the project level and provides no protection for underrepresented ecological conditions, e.g., the abundance and distribution of large trees.

The assumptions in the DEIS about the nature and intensity of vegetation management practices are also not consistent with the actions allowed by the draft plans. The timber suitability analysis (draft plans, Appendix E) refers to the use of group selection and estimates the area of application for each forest by decade (Sierra draft plan, 156). Group selection, however, is not specially defined in the draft plans and a generic definition is provided in the glossary. The DEIS, however, assumes that group selection has certain characteristics. For example:

> Group selection openings would generally be small areas between 0.5 to 3 acres in size where most or all trees are removed to facilitate the establishment of a new age cohort. Group selection generally mimics historic disturbance processes by regenerating approximately 15 percent of the forested stand, increasing heterogeneity across the landscape and contributing early seral regeneration patches, within an overall uneven-aged landscape (Franklin et al. 2002; North et al. 2009; North 2012). (DEIS p. 572)

The draft plans provide no guidance on the use of group selection and even the assumptions about opening size are at odds with the stated desired conditions for a variety of vegetation types that refer to smaller opening sizes:

> TERR-POND-DC 03 "…The opening sizes are varied, mostly ranging from 0.05 to 0.12 acres in size, occasionally greater than 0.12 acres, and contain a mix of grasses, herbaceous plants, and shrubs, and young trees." (Sierra draft plan, p. 18)
>
> TERR-MMC-DC 06 "…These openings make up 10-30 percent of the area, are typically less 0.75 acres in size, and contain a mix of grasses, forbs, and shrubs. (Sierra draft plan, p. 22)

Additional guidance on the appropriate use of group selection is needed in the plan, especially since it has been used recently elsewhere in the bioregion to generate timber revenues and when applied inappropriately can degrade habitat quality for some at-risk species.

The above assumptions, with the exception of those related to group selection, result in an underestimate of the potential impacts of the draft plans on large trees and canopy cover. We ask that these assumptions be revised to be consistent with the actions permitted by the draft plan and alternatives. In the case of group selection we find that the effects of using this method simply are not evaluated in the DEIS and they must be in order to comply with NEPA.

We also find that there is a blurring of distinctions between "plan components" and "potential management approaches." The application of specific "potential management approaches" is frequently invoked in the DEIS as a plan component that guides or governs management. In some cases, "potential management approaches" are presented as plan components:

> This alternative manages the same riparian conservation areas as alternative A and uses **the full suite of plan components (desired conditions, standards and guidelines, goals, and potential management approaches)** to better move riparian ecosystems toward resilience to fire and climate change. (DEIS, p. 421, emphasis added)

The planning rule limits plan components to desired conditions, goals, objectives, standards, guidelines, and suitability of lands. (36 CFR 219.7). A "potential management approach" is not a plan component; instead, it is referred to as "optional plan content." The following example also blurs the distinction between what constitutes direction in the plan versus speculation about actions that might be taken:

> A potential management approach is also included to develop a regional whitebark pine conservation and restoration strategy in collaboration with other Federal agencies, research organizations, and other partners. Another potential management approach is proposed to collect and archive seeds, and proactively manage or restore whitebark pine to improve resilience after disturbance. These are all in contrast to alternative A, which has general direction to protect the diversity of plant communities and seral stages, but has no direction specific to whitebark pine. (DEIS, pp. 447-448)

In this instance, Alterative B is judged to be better than Alternative A because it has "direction" specific to whitebark pine. In reality, the draft plans have a limited influence on project level

activities since they only include three desired conditions and a goal, and lack objectives, standards or guidelines related to this species.

The DEIS should be revised to make clear that the analysis of effects is not relying on "potential management approaches" as a threshold for disturbance or to define the "direction" in the forest plan. Furthermore, it should be made clear in the analysis that only the six plan components can be used to judge whether the plan meets the requirements for sustainability (36 CFR 219.8) and plant and animal diversity. Any aspects of the "potential management approaches" needed to meet these requirements should be incorporated into standards or guidelines.

D. Restored Condition Not Consistently or Clearly Defined

The DEIS and supplemental reports refer to "restored" condition in ways that are inconsistent. The fire-climate analysis (Westerling et al. 2015) considers the "restored" condition to be one that satisfies the definition of Fire Regime Condition Class 1 (FRCC 1). Nowhere in the DEIS or draft plans are the specific characteristics of FRCC 1 or any other FRCC defined. Despite this lack of definition, the amount of the landscape moved from FRCC 2 and 3 to FRCC 1 is used to evaluate the success of a given alternative.

The Fire Ecology supplemental report (p. 15) states that "The desired conditions for vegetation were designed to provide landscapes that represent fire regime condition class 1 overall." Based on the desired conditions in the draft plans and the characteristics described in the DEIS (pp. 137-138), this would include aspects of composition, structure, process (i.e., fire), and resilience (e.g., fire, insects, climate change). Thus, a "restored" condition for dry mixed conifer would include the following:

> It is dominated by ponderosa pine and Jeffrey pine trees, with varying amounts of white fir, red fir, incense cedar or sugar pine. (e.g., Sierra draft plan, p. 20)
>
> Trees greater than 30 and 40 inches in diameter are common, especially pine and black oak. (e.g.,Sierra draft plan, p. 20)
>
> Between 40 and 80 percent of the forested landscape contains old forest areas. Old forest areas are clumps and patches of old forest components such as old trees, snags and large downed logs. (e.g.,Sierra draft pan, p. 30)
>
> Large trees are well distributed but are often clumpy. The densities vary by forest type as shown in Table 7. (e.g.,Sierra draft pan, p. 30-31)

We know from the literature and summarized in the DEIS that there is a low level of similarity between existing and desired conditions for dry mixed conifer across most attributes (DEIS, Table 37, p. 147). Shifting species composition, developing structural defects and decadence, and growing large trees all take time to accomplish and require that the forest grow into those conditions. As a result, achievement of these conditions at the levels reflected in the desired conditions presented in the draft plans will take decades to centuries of development.

Surprisingly, the DEIS finds that "Up to half of the landscapes most departed from desired conditions would be restored within the next 10 years in alternative D and be resilient to fire, climate, drought, insects and pathogens" (DEIS, p. 85). The claim that the landscape is restored after the first treatment is repeated in other parts of the DEIS. This is an incorrect statement and illustrates the ongoing confusion in the analysis about the progress of restoration and the change to conditions that a treatment will cause. The presumption above that the condition is "restored" after logging illustrates that the analysis in the DEIS is actually evaluating the achievement of lower tree density, lower canopy cover, and lower surface fuel conditions (possibly) since these are the only changes that can be realized by logging in the first decade.

This interpretation of "restored" condition also leads us back to consider the Westerling et al. (2015) analysis. Treatment benefit in that model is achieved when FRCC 2 or 3 is moved to FRCC 1. The analysis in the DEIS assumes that any treatment applied accomplishes the transition to FRCC 1 and that the only differences among the alternatives is the amount of area treated. Given this, an increase in the acreage of the management approach in Alternative C would achieve the same level of benefit to fire trend and resiliency compared to Alternative B.

We ask that the DEIS be revised to address what will actually be occurring – a transition to desired conditions over time – under all alternatives and recognize that this transition will take longer than the life of the plan. If a short- and mid-term goal is to increase the fire resiliency and reduce the incidence of large, severe fires that should be stated more clearly. Stating this clearly is essential to determining the plan components needed to move toward desired conditions while not compromising, for example, species at-risk that are dependent on the type of dense forest that exists today.

E. Claims about the Overabundance of Large Trees Are Not Supported by Data and Are Contrary to Available Data

The DEIS makes the claim that on the Sierra National Forest there are 95,000 to 100,000 acres of stands that now consist mostly of trees greater than 30 inches in diameter:

> This is especially true in the areas that overlap with old railroad logging sites where most trees, including the younger trees are now greater than 30 inches in diameter. (DEIS, p. 171)

Although mentioned many times in the DEIS, there are no data or references provided to support this claim. We are aware of studies and data sets that do not support this claim.

The Sierra Adaptive Management Project (SNAMP) included a 8,256-acre study site in the northern part of the Sierra National Forest near Sugar Pine (Fry et al. 2015). Historically, Sugar Pine (the community) was the site of a mill and significant railroad logging occurred around the community. Vegetation data from the Sugar Pine study site quantified "big tree density" (defined as live trees greater than or equal to 28 inches) and "overstory density" defined as all live trees greater than or equal to 7.67 inches). Big tree densities averaged 23 stems per acre (standard deviation equals 2) and 17 stems per acre (standard deviation equals 1) (Fry et al. 2015, p. 58). The overstory density was 89 trees per acre and 125 trees per acre, respectively. This inventory

data is within the desired conditions noted in the Sierra draft plan (p. 31) for large tree density and clearly shows that most trees are not greater than 30 inches in diameter, i.e., only 14 to 26 percent of the trees per acre were greater than 28 inches in diameter.

We also examined inventory data presented in three areas where logging projects had been planned. The plot data for the stands in the Greys Mountain Ecological Restoration Project, another project located in the region where railroad logging occurred, reported that the mean tree diameter for sampled trees greater than 10 inches range from 16 inches to 24 inches, indicating that most of the trees in these stands were not over 30 inches in diameter (USDA Forest Service 2012). The Whisky Ridge Ecological Restoration Project reported that the trees per acre greater than 30 inches ranged from 0 to 26 trees per acre with these large trees representing less than 25 percent of the trees per acre larger than 10 inches diameter in a given plot (USDA Forest Service 2013d). The Kings River Project located on the High Sierra Ranger District near Shaver Lake (USDA Forest Service 2007) included project data that characterized 145 stands covering about 13,800 acres. Mean diameter of these stands was about 17 inches and ranged from 2 inches to 31.2 inches. For this entire area, there was only one stand (93 acres) with a mean diameter above 30 inches. This particular stand was a CWHR 5P stand with a canopy cover of about 26 percent and reflects a type, open mature forest, promoted by the draft plan as in deficit. Based on the desired conditions, this stand would not "need" to have large tree numbers reduced. The last project area we examined is the Exchequer Project now in development on the High Sierra Ranger District and within the Dinkey Collaborative Forest Restoration Project (CFLRP). The corporate data set for this 8,000-acre planning area has 700 inventory plots. Forty plots out of 700 contained only trees greater than 30 inches in diameter. Thirty-six plots were typed CWHR 5S or 5P and four of these plots were CWHR 5M. This database offers estimates of fire behavior and forest health. The fire behavior estimated for these forty plots is surface fire with exceptions on only four plots, i.e., three passive crown fire and one conditional crown fire. All stand density index ratings for these plots are less than 60% SDI_{max} and all but three plots are within 35-40% SDImax the range often the target of thinning. The above data supports the conclusion that in the areas where railroad logging has occurred most of the trees are not greater than 30 inches in diameter and where present they generally do not exceed the range for productive sites.

In addition to the recent inventory data identified above, the drought related trees mortality event has resulted in the loss of additional medium to large trees in the last 2 years. The screen shot below was taken from the Tree mortality Viewer. This image estimates the number of dead trees per acre in an area that covers the north and central portions of the Sierra National Forest. The project areas noted above, including the SNAMP project, all occur within the central portion of this map. Mortality in these areas ranges from none to over 40 trees per acre with larger trees (greater than 15 inches in diameter) being strongly affected.

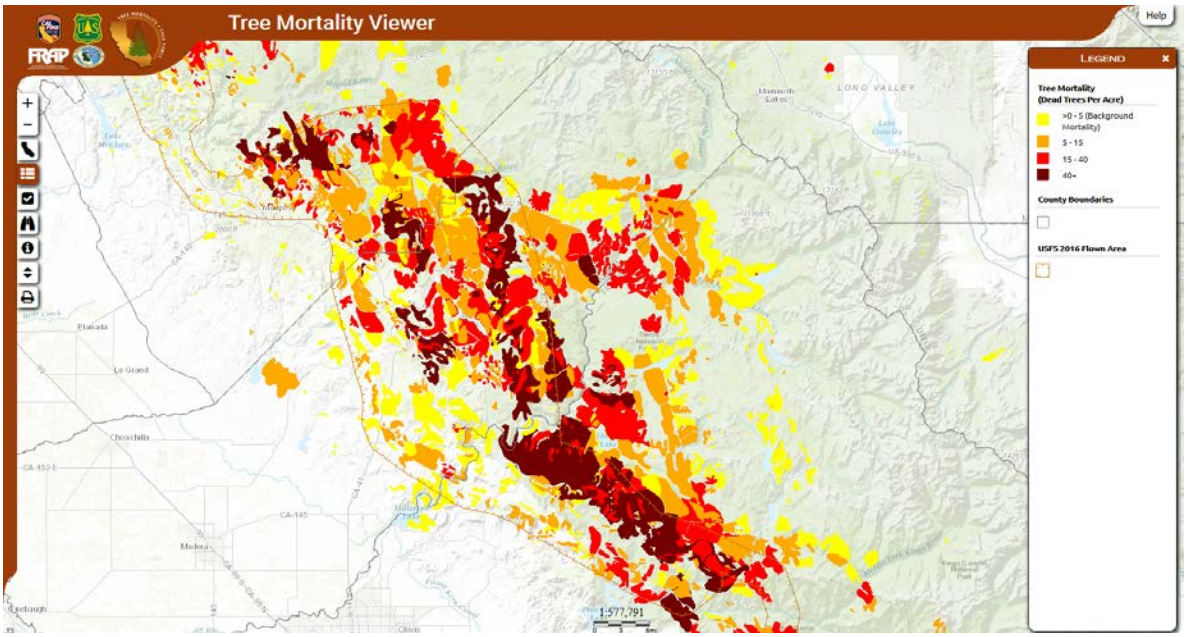

Figure 1. Map of tree mortality detected through May 2016 from aerial surveys. Data source: screen shot from Tree Mortality Viewer (http://egis.fire.ca.gov/TreeMortalityViewer/) accessed August 7, 2016.

We ask that any statements about "excessive" numbers of trees greater than 30 inches in diameter be support by spatially explicit data. Such estimates should also take into account the recent tree mortality experienced and include an estimate of additional mortality expected in the near term from the continuing effects of drought and the beetle epidemic.

We also note elsewhere in these comments that there is no science support for removing large trees in order to reduce fire risk. Thus, the DEIS provides no credible basis for waiving the diameter limit in the existing forest plans.

F. Method Used to Set Restoration Acreage Not Defined

The DEIS estimates the amount of treatments for each alternative, including mechanical treatment, prescribed burning, and the area of wildfire managed for resource benefit (DEIS, p. 50). There is no explanation about the assumptions used to assign these values. These values are then used to drive the analysis of alternatives in the DEIS (see for example, DEIS, p. 68-69).

We ask that you provide the assumptions and methods to assign the acreage targets to each alternative so that we can review in detail the design of the plan and the alternatives and determine if such assumptions are rational and based on the best available information.

G. Defining the Spatial Locations of Moist and Dry Mixed Conifer

Although desired conditions strongly differ between moist and dry mixed conifer, these land areas are not clearly defined in the narrative or spatially in the draft plans. The vegetation data

set commonly used in project level planning, EVEG, does not distinguish between "moist" and "dry" mixed conifer. Furthermore, maps in the DEIS introduce additional confusion by including areas referred to as "ridge," "mesic," "intermediate," and "dry" (DEIS, Figure 33, p. 180) without explaining their relationship to the desired conditions for moist or dry mixed conifer. We ask that you provide spatial and narrative definitions for moist and dry mixed conifer in the draft plans and evaluate these in the DEIS.

H. Lack of Clarity in Some Plan Components

Several plan components are not clearly written and would benefit from revision to clarify their meaning and intended application. Plan components of concerns include:

Application of the term canopy cover in desired conditions and monitoring program
Canopy cover can be estimated or measured in several different ways. The differing methods do not produce the same result. For instance, measurements derived from a densiometer tend to be higher than indirect estimates using plot data and modeling canopy cover in the forest vegetation simulator (FVS) (Fiala et al. 2006). In project planning, canopy cover is often estimated using remotely sensed data (i.e., EVEG), but we are not aware of any comparison of EVEG estimates of canopy closure to the other estimates. We ask that preferred method(s) used to estimate canopy cover be established in the draft plans and any disparity in estimation between allowable methods be accounted for. This is especially important since the ecological conditions for some species associated with mature forests are strongly associated with forests with dense canopy. Because of this the use of a reliable and consistent method to estimate canopy cover was recommended in both the California Spotted Owl Interim Recommendations (USDA Forest Service 2015a) and the Fisher Conservation Strategy (Spencer et al. 2016).

Seral stage desired conditions (e.g., SNF draft plan, Table 1, p, 23)
First, this table is labelled "amount of seral stage patches (>10 acres)…" The table then reports percentages for the values. It seems the table would more appropriately be labeled "Proportion of seral stage patches (>10 acres)…" Second, the title refers to "patches (>10 acres)." It is not clear how this affects the estimate of seral stage distribution. Does this mean that all patches less than 10 acres in size should be excluded from the estimate of seral stage? Please clarify the intention and specify the method to apply when estimating. Third, how do these categories relate to desired conditions for Complex Early Seral Forests and Old Forests? In this table, are complex early seral forests the same as "early seral"? With respect to Old Forests, how does Table 4 relate to the column in Table 7 "proportion of landscape with large and/or old trees? In both cases, the terms and conditions should be associated, but the linkage is not clear.

Application of broad ranges in desired conditions
Many of the desired conditions are represented by broad ranges. For example, tree density for "ponderosa pine dry mixed conifer" identifies ranges from 20-200 square feet of basal area per acre at the stand scale. What moderates the repeated application of the lower end of the range when projects are being designed? The same question could be asked of any of the tables and of great concern are the ranges in table 7.

I. Old Forests

Old forests are vital components of Sierra Nevada ecosystems. They provide habitat for associated flora and fauna, ecosystem services such as clean water and climate moderation, and they are areas of high social value. Most definitions are qualitative and describe late-seral or late successional stage forests dominated by large trees, malformed trees, snags, and downed logs. They contain more structural diversity within patches, diversity among patches, as well as continuity and wider distribution across the landscape compared to cut-over forests (USDA Forest Service 1998).

Today roughly 17 percent of forests in the Sierra exhibit late-successional characteristics (Franklin and Fites-Kauffman 1996; Barbour et al. 2002). The amount of forest that has never been logged is far less, perhaps less than five percent (Barbour et al. 2000). Most of the remaining stands have been highly fragmented, with the majority of old growth found over 5,000 feet in elevation, in wilderness reserves, or in steep inaccessible canyons. Current threats to this seral stage include logging, fire exclusion, and uncharacteristically large and severe fire.

The draft forest plans appropriately recognize the importance of old forests and include desired conditions that highlight key aspects of structure, composition, and process that define them. Unfortunately, the draft plans have no other plan components to assure that the threats to maintaining or restoring old forests will be ameliorated and the desired conditions achieved, as directed by the planning rule.

1. The Draft Plans Provide Little Direction to Protect Old Forests

Beyond providing desired conditions, there is little direction in the draft plans to achieve or maintain desired conditions, or to avoid or mitigate undesirable effects. There is one standard and two guidelines that address large living or dead trees, a key characteristic of old forest conditions. TERR-FW-STD 01 protects trees 30 inches in diameter or greater but allows significant exceptions such as:

- Activities in community protection and wildfire protection zones (1 million acres; about 26% of land base)
- Equipment operability
- Group selection anywhere on land base (and for any other non-thinning or stand density harvests) (DEIS, p. 91)

Since the protection zones occupy a significant portion of the mixed conifer zone, we expect that most logging projects will be in these zones and not be subject to the 30 inch diameter limit. The explicit reference to group selection in the timber suitability appendix indicates the intention to use this practice. Because this practice is not defined in the forest plan we have no way of evaluating how it will be applied. Appendix E estimates an amount of this practice that might occur, but is clear that this value does not control or direct any particular level of accomplishment. Thus, more area could be treated with this practice.

Lastly, there is no direction that requires that the desired conditions be met immediately following logging and thus no requirement to provide the densities of trees noted in Table 7 (e.g., Sierra draft plan, p. 31) immediately post treatment. There is, however, a guideline (TERR-OLD-GDL 01, Sierra draft plan, p. 96) that directs the removal of trees if they exceed the levels noted in the desired conditions, i.e. Table 7. One additional guideline makes reference to retaining large trees, but it is vague and not specific (TERR-FW-GDL 01 "Projects should facilitate…retaining important habitat structures") and does not require the retention of specific levels linked to desired conditions. Thus, the emphasis is on removal when desired conditions are met, but no attention is paid to retaining large trees if desired conditions currently are not met.

2. Broad Ranges in Desired Conditions Allow for Significant Loss of Large Trees

Even if standards and guidelines were used to establish expected large tree retention levels immediately following logging, the removal of significant numbers of large trees within the community protection zones would still be allowed in these draft plans. This is because the range of large tree levels provided in Table 7 is very broad and these values appear to be established at the landscape scale (i.e., >10,000 acres). This means that a given logging project in the protection zones (about 1 million acres on these zones exist in the plan areas) could remove nearly all the trees greater than 30 inches in diameter in a project, since this change would likely not be detectable at the landscape scale (>10,000 acres). Furthermore, the diameter limit exception allowed for group selection practices that remove all trees in a given area extends the threat of logging on large tree distribution and abundance across the plan areas (i.e., into the wildfire management and restoration zones).

3. Assumptions in DEIS About Large Tree Removal Are At Odds With What is Allowed by the Draft Plans

As we have noted elsewhere for a variety of attributes, the assumptions in the DEIS about what will occur under the draft plans do not match what the draft plans allow. For instance, the DEIS finds that "The removal of large-diameter trees (greater than 30 inches in diameter) would be an exception…" (DEIS, p. 377). Combined with this, the DEIS fails to recognize that group selection logging, a practice not specifically defined in the draft plans, could be used to target the removal of large trees in the name of "regeneration" harvest and to boost the timber value of the project. The combination of these unsupported assumptions and the failure to recognize the potential impacts from groups selection practices results in an effects analysis that underestimates the impacts of the logging allowed by the draft plans.

4. Threats from High Densities of Large Trees not Supported by Evidence

In several instances the DEIS claims that large tree numbers are so high they threaten the persistence of old forests and individual large trees. As noted above, these statements are not supported by evidence and data provided in this comment letter does not support these assertions. This assertion in the DEIS also does not take into account the recent wave of tree mortality occurring on the Sequoia and Sierra national forests. This drought

and beetle induced mortality event is ongoing and has reduced the total numbers of trees on these two plan areas. It is not yet known the extent to which the event has affected the old forest seral stage, but given the extent of the event in the mixed-conifer zone (slightly over 300,000 acres out of 800,000 acres with greater than 5 dead trees November 2015; Terrestrial Vegetation Resilience Supplemental Report, p. 12) it is likely that self-thinning has occurred within some old forest patches and overall trees numbers are likely less and numbers of large trees may also be less than assumed in the DEIS.

5. Recommendations

We believe that actions to protect and restore old forest conditions should be integrated with efforts to increase habitat connectivity, restore ecological processes such as fire disturbance and water purification, restore structural diversity, and reduce risk to species associated with old forests. The best management strategy to maintain and expand old forests is to adopt a spatially explicit conservation strategy to actively manage and protect specific areas for old growth values, as recommended in the Sierra Nevada Ecosystem Project (Franklin et al. 1996). This is an approach similar to that taken in the Northwest Forest Plan (USDA Forest Service and USDI Bureau of Land Management 1994), the 2001 Sierra Nevada Framework (USDA Forest Service 2001a) and required by the Forest Stewardship Council certification program to protect old growth forests and other forests with high values.

To protect and conserve old forests consistent with the comments we submitted in scoping, we recommend that the forest plans include:

- A managed reserve system that sets the conservation of old forests as its priority and manages disturbance regimes including fire, insect outbreaks, and disease within the natural range of variability;
- Standards and guidelines that limit removal of large trees across the entire landscape; and
- Standards and guidelines that require the retention of significant numbers of medium sized trees to provide for the recruitment of large tees in the future.

J. Complex Early Seral Forests

We are pleased to see that the draft forest plans include plan components for complex early seral forest (CESF) habitat. It was not long ago that forest managers across the region considered every fire-killed tree left standing in the forest to be of no ecological value. The inclusion of CESF plan components suggests that forest managers now consider CESF to have unique and important ecological value that should be protected and balanced against extractive interests.

1. Definition of Complex Early Seral Forests Not Based On Best Available Science Information

Ecologists have defined complex early seral forest (CESF) as containing the following characteristics:

> Early seral forests are ecosystems that occupy potentially forested sites after a stand-replacement disturbance and before re-establishment of a closed forest canopy (Swanson et al. 2011). Such forests are generated by disturbances that reset successional processes and follow a pathway that is influenced by biological legacies (e.g., large live and dead trees, downed logs, seed banks, resprout tissue, fungi, and other live and dead biomass) that were not removed during the initial disturbance (Franklin et al. 2000; Donato et al. 2012). **Where these legacies are intact, complex early successional forests (CESFs) develop with rich biodiversity due to the function of the remaining biomass in providing resources to many life forms and because of habitat heterogeneity provided by mixed-severity fires that generated them (Odion and Sarr 2007; Swanson et al. 2011).** In general, mixed-severity fires, which include patches of high-severity fire, create coarse-grained, high-contrast heterogeneity that results in CESFs, and, over time, a complex mosaic of seral stages at the landscape and local scales. Low to moderate fire severities create fine-grained, lower contrast heterogeneity that generate very little if any CESFs, although they create other conditions favorable to biodiversity. Many effects of fire cannot be mimicked by land-use disturbances (Odion and Sarr 2007). Suppression of fire and removal of biomass after a fire are thus causes of reduced biodiversity and ecological integrity. (DellaSala et al. 2014, p 310, emphasis added)

The condition is dependent on the retention of the full array of legacies (i.e., not subject to post-fire logging or native vegetation control) and experience of natural regeneration (i.e., not seeded or planted) when a natural disturbance resets successional pathways.

The definition of CESF provided in the draft forest plans is not based on the best available science information. For example, the Sierra draft plan (p. 162) defines CESF as "a type of early successional forest habitat that contains structural, compositional, or functional elements of ecological complexity or integrity. These post-disturbance elements may include large snags, logs, and isolated live trees or tree clumps, as well as patches of young native shrubs, hardwoods, herbaceous plants or tree regeneration. Spatial heterogeneity in vegetation structure and diversity in vegetation composition during post-disturbance recovery is an important element of complexity in early seral forest habitat." This definition for CESF would allow areas that are salvage logged to still be considered CESF if "some" of any the structural elements provided in the definition would remain post-salvage. This definition is not consistent with the concept of CESF described and discussed in the scientific literature. This definition also creates significant ambiguity about what is "CESF" and we see no ecological rationale for such ambiguity.

Compared to logged areas, CESFs are structurally more complex, contain more large trees and snags that originated from the pre-disturbed forest, have more diverse understories, functional ecosystem processes, and more diverse gene pools that, theoretically, should provide greater resilience in the face of climate change than that provided by the simplified early seral forests produced by logging (DellaSala et al. 2014). Despite these ecological values, the draft forest plans appear to have determined that the economic value far exceeds the ecological value of CESF and is more important than moving the landscape toward desired conditions.

Natural succession is an ecological process that often begins with fire, and proceeds through multiple stages of forest development, in various degrees throughout the forest depending on fire severity and pre-existing forest composition (Franklin et al 2002). Disruption of this natural process through salvage logging and planting interrupts the natural successional process, and results in reduced biodiversity (Lindenmayer and Franklin 2008). To preserve natural ecological processes and biodiversity, many leading forest ecologists today emphasize the importance of naturally evolving early successional forests, noting that they are now the rarest type of forest today:

> Currently, early-successional forests (naturally disturbed areas with a full array of legacies, i.e. not subject to post-fire logging) and forests experiencing natural regeneration (i.e. not seeded or planted), are among the most scarce habitat conditions in many regions…Our research, while exploratory in nature, suggests that complex early-seral communities have importance on par with complex late-seral forests in providing habitat for conservation-listed species. (Noss et al 2006)
>
> Traditional intensive forest management encouraging prompt reforestation and few legacies is unlikely to approximate the role of naturally generated early-seral conditions (Swanson et al. 2014).
>
> Consequently, many national forest landscapes currently lack sufficient representation of high-quality early seral ecosystems because of harvest, reforestation, and fire suppression policies on both private and public lands (Spies et al. 2007, Swanson et al. 2011) (in Franklin and Johnson 2012).
>
> Alpha (species) diversity of both plants and animals is often highest early in succession before tree-canopy closure occurs, lowest in the heavily shaded young forest, and recovers to intermediate as the forest matures and evolves into old growth. (Franklin and Spies 1991).
>
> Young forests growing within a matrix of unsalvaged snags and logs may be the most depleted forest habitat type in regional landscapes, particularly at low elevations (Lindenmayer and Franklin 2002). (in Brown, Agee, and Franklin 2004).
>
> While scientific and management focus has been on the structural complexity of large-stature forests and the habitat relationships of associated organisms, an emerging body of literature shows that a similar or even greater number of species such as songbirds and butterflies are closely associated with the structural and compositional features of small-stature pre-forest vegetation (Betts et al. 2010). (in Donato et al. 2012).
>
> Swanson et al. (2011) recommend avoiding the certain activities in post-fire proposals: "Natural disturbance events will provide major opportunities for these ecosystems, and managers can build on those opportunities by avoiding actions that (1) eliminate biological legacies, (2) shorten the duration of the ESFEs, and

(3) interfere with stand-development processes. Such activities include intensive post-disturbance logging, aggressive reforestation, and elimination of native plants with herbicides."

Areas devoted to intensive timber production generally provide little high-quality early seral habitat for several reasons. First, few or no structures from the preharvest stand (e.g., live trees, snags, and logs) are retained on intensively managed sites but are abundant after severe natural disturbances." and "Intensive site preparation and reforestation efforts limit both the diversity and the duration of early seral organisms, which may also be actively eliminated by use of herbicides or other treatments. (Swanson et al. 2011)

The need to pay more attention to biodiversity issues in plantation design and management is supported by observational, experimental, and theoretical studies that indicate that biodiversity can improve ecosystem functioning, i.e., it is not just the importance of biodiversity per se but its role in improving the overall resilience of the new ecosystem. (Carnus 2006)

A cautious approach is to increase habitat that is currently rare, or underrepresented compared to active-fire forest conditions, avoid creating forest conditions that do not have a historical analog, and emulate the spatial heterogeneity of forest conditions that would have been created by topography's influence on fire frequency and intensity. (North 2012)

We asked that you revise the definition of CESF included in the plans and develop standards and guidelines, based on the science information noted above, to conserve this important seral stage. We also ask that you use this information to evaluate the effects of the alternatives on the creation and development of this seral stage.

2. DEIS Fails to Analyze the Effects of Salvage Logging on Complex Early Seral Forest of Different Forest Types and Large Legacy Structures

Just as unburned, dense, and mature mixed conifer forests provide habitat for different communities of plant and wildlife species compared to unburned, sparsely stocked, and young lodgepole pine forests, so too do these different forest types and structures provide habitat for different suites of plant and wildlife species after a stand replacing event. Not only do the wildlife communities differ between different post-fire forest types and structures, but so too does the longevity of the snags and downed logs, the likely future vegetation composition, and duration of the complex early seral stage. In addition to the ecological differences, the likelihood that different forest types and forest structures will be salvage logged also differs. For instance, there is considerably more economic value in a mixed conifer forest stand composed of many trees over 20 inches dbh that burns at high severity than an upper montane forest stand composed mostly of trees smaller than 20 inches dbh. This economic difference creates a greater economic incentive to salvage log, and therefore creates a greater ecological threat from salvage logging dense mixed conifer forest composed of large trees after a moderate or high severity event.

The draft forest plans, the DEIS analysis, and the supplemental report on complex early seral forest do not distinguish between different forest types, structural classes, or tree densities that burn at high severity or consider differences in ecological or economic value. The DEIS and supplemental report simply assume that because a large proportion of burned forests are not salvaged logged and the number of acres which burn at high severity across the Sierra Nevada is increasing, therefore there should be sufficient CESF on the landscape. Due to the differences in ecological value and economic value of different post-fire forest types and structures, the DEIS should quantitatively and spatially define the area of each forest type and stand structure (e.g., CWHR 4D, 5D, and 6) that burns at high and moderate severity, and compare these to the area of these forest types and stand structures where salvage logging has occurred under the current forest plans. Such an analysis should also determine how such salvage logging has affected the amount of different forest structural classes and densities and discuss how this would affect ecological integrity.

3. Draft Forest Plan Components for Complex Early Seral Forests Conflict and Therefore Do Not Ensure Ecological Integrity Will be Provided

The 2012 Forest Planning Rule provides the following definition of *ecological integrity*: "The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence." (36 CFR § 219.19) Also required by the 2012 planning rule, "The plan must include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore their structure, function, composition, and connectivity." (36 CFR § 219.8(a))

As we discussed at length in our scoping comments, the plan components for CESF conflict with each other and should be resolved through specific plan direction. For instance, TERR-CES-GLD-3 states, "Post-disturbance restoration projects should be designed to protect and maintain important wildlife habitat" is in direct conflict with TERR-CES-GDL-5, which states, "Post-disturbance restoration projects should be designed to recover the value of timber killed or severely injured by the disturbance." These two plan components are in direct conflict because large fire-killed trees provide disproportionately high wildlife habitat and economic value. The failure of the forest plans to provide any guidance for how project-level decisions should be made to balance multiple-use objectives when planning and implementing salvage logging projects is a planning failure. Forest plans are required to provide ecological integrity; therefore, the plan must ensure that projects implemented under the plan will provide ecological integrity. Deferring such management decisions to the project-level, where it is uncertain that the project-level decision maker will choose to provide ecological integrity, suggests that the plan does not ensure ecological integrity will be provided. It is our experience working at the project-level that when salvage logging decisions are left to the project-level, forest industry and local political and economic interests are chosen over all other interests. In addition, all of the guidelines for CESF in the draft plans, except TERR-CES-GDL-6, are so ambiguous that it is unclear how a project's

consistency with each of the components would be easily determined. Finally, the DEIS provides no analysis or discussion for how the CESF plan components would balance the conflicting multiple-use interests involved in salvage logging.

4. Salvage Logging and Reforestation Criteria Conflict with Desired Conditions and NRV and therefore Create Conditions that are not Resilient and Do Not Provide Ecological Integrity

The forest plans allow areas that burn within NRV and meet desired conditions to be salvage logged and densely replanted using industrial timber reforestation methods (TIMB-FW-STD-2, TERR-CES-GDL-5). In contrast to the ecological integrity inherent to forests that burn within NRV, salvage logging areas that burn within NRV and industrial reforestation methods are antithetical to the concept ecological integrity. Both practices move most aspects of the landscape condition away from NRV.

There is no legitimate ecological justification to salvage log areas that burn within NRV, except when the fire-killed trees represent a direct hazard to human life and safety or in strategic locations identified as control points for future fire management. When a fire, or any portion of a fire, burns within NRV, the area in question "can withstand and recover" from "perturbations imposed by natural environmental dynamics." (36 CFR § 219.19) The area in question will also have been moved toward desired conditions by the fire, if it does not already meet desired conditions. When portions of fires burn within NRV, the resulting conditions are, by definition, "desired". Desired conditions should not require any immediate management action, other than those activities deemed necessary to protect human life and property. These areas should be considered "treated" from a fuels and forest restoration perspective, and the only future management activity that should be planned in these areas within the next 10 to 20 years is the use of fire managed for resource benefits to maintain the desired condition.

Areas that are converted to dense tree plantation are not resilient to drought or fire. The DEIS acknowledges this (p. 247), "There is often, but not always, a pattern of repeated fires in the same vicinity, that burn intensely through plantations. The most notable examples are on the Stanislaus National Forest, near and in the Rim Fire area, which were often established following earlier uncharacteristically severe wildfire events (like the 1987 Stanislaus Complex)." Large blocks of homogenous trees, uniformly spaced, with limited diversity and high crown connectivity do not exist in the natural forest evolutionary process of the strongly fire-associated forests in the Sierra Nevada. Even aged stands were probably relatively uncommon in the pre-settlement era (Weatherspoon 1996) and Stephens and Moghaddas (2005) found that, "in both pre-commercially and un-thinned plantations overall tree mortality is well above 80% at all modeled fire weather conditions." Swanson et al. (2011) suggest that, "Naturally regenerated [CESFs] are likely to be better adapted to the present-day climate and may be more adaptable to future climate change. The diverse genotypes in naturally regenerated [CESFs] are likely to provide greater resilience to environmental stresses than nursery grown, planted trees of the same species."

In a recent Forest Health Report (SS15-001) to the Sierra National Forest (Bulaon and Makenzie 2015) the authors, Beverly Bulaon (Forest Service Entomologist) and Martin Mackenzie (Forest

Service Plant Pathologist) mention the high level of bark beetle attack in young and older plantations throughout the Sierra National Forest. The 10-page report mentions bark beetle attack in plantations eight times in the ten-page document. The authors note with alarm that, "Entire patches of older plantations that would have previously been regarded at lower risk - low basal area, minimum brush competition, and adequate spacing - were completely infested within a single year." The most beetle-impacted areas on this national forest have been in plantations. The authors point to "extreme" drought conditions in the Sierra Nevada and that increasing population numbers of Western Pine Beetle often attack plantations, "due to their high proportion of even-aged trees, at high densities." These are conditions that the draft plans promote by including minimum restocking levels of 200 trees per acre for ponderosa pine and mixed conifer and 300 trees per acre for true fir (SNF draft plan, p. 158).

5. Salvage Logging and Industrial Reforestation Methods are not Economically Justified

There are no economic justifications to salvage log areas that burn within NRV and then implement industrial reforestation methods. The Forest Service spends millions of dollars a year to conduct prescribed burns and mechanically treat areas in the name of forest restoration and mimicking the natural disturbance processes like mixed severity fire to which these forest are adapted. In addition to being ecologically illogical to salvage log a desired condition, most post-fire "restoration" projects proposed by the forest service result in an economic deficit. For instance, a March, 2005 report to Congress from the General Accounting Office found large data reporting inaccuracy prevalent in the way the Forest Service determines reforestation needs. The report also found that:

> In some places, regional culture that reflects a former management emphasis and budgetary situation influences current practices. For example, when reforesting an area, **officials in the Pacific Southwest region almost always rely on planting—a more expensive method than natural regeneration—because they have always done so** and, according to agency officials, this practice has been reinforced by the regional culture. When the agency-wide management emphasis was timber production, reforestation standards called for prompt reforestation and tightly spaced trees to maximize timber volume; so officials rarely relied on natural regeneration, which does not necessarily ensure rapid reforestation or result in tightly spaced trees. In addition, when timber revenues were higher and reforestation efforts centered on harvested areas, the region could always afford to plant. Now, as the agency's management emphasis has shifted to ecosystem and forest health, and as budgets have become increasingly strained, officials in the Pacific Southwest region said they are beginning to encourage greater reliance on natural regeneration, but it remains to be seen whether forests and districts will adjust their practices, accordingly (emphasis added).

The GAO made specific recommendations to the Forest Service that were agreed upon by Chief Dale Bosworth in his response to the GAO report. These included a recommendation to establish criteria for prioritizing the use of reforestation funds:

> The shift in management emphasis from timber production to ecosystem management, combined with constrained budgets and changing sources of reforestation needs, has changed the context in which the reforestation and timber stand improvement program operates. However, the Forest Service has not updated its goals and policies for the program to reflect this change. Until the agency does so, it will be difficult to establish criteria for prioritizing the use of reforestation and timber stand improvement funds. In the current budget environment, such criteria are crucial for identifying the best investments to minimize possible adverse effects so that the Forest Service can fulfill its stewardship responsibility and ensure the lasting health and productivity of our national forests (GAO 2005).

The forest plan revision process is the opportunity to address this recommendation, yet the draft forest plans fail to provide this much needed direction. Guidance for setting priorities should be included in the forest plan. Furthermore, the ecological benefits and economic consequences of the direction and alternatives to it should be evaluated in the DEIS.

The ecological and environmental factors that result high and low levels of natural tree regeneration are not entirely clear. However, natural regeneration is generally prolific after fires in the Sierra Nevada, although it is hindered by salvage operations (Donato et al 2006). In a study of regeneration in the Fred's Fire, areas that had not been planted showed "prolific" conifer regeneration in the majority of plots, even in those which burned with high severity (Bohlman 2012). Additionally, Shatford et al. (2007) reported on the abundance of natural regenerating conifers occupying sites 9-19 years after stand-replacing fires in northern California. The authors characterize their report as redefining "concepts of the role and reliability of natural regeneration in high frequency fire systems in the context of ecosystem management." They state that, "managers relying on natural regeneration should feel increased confidence and need to develop plans that can accommodate high levels of variation and accept the prolonged time line of the regeneration process." Shatford et al. (2007) also found there was no evidence of recent conifer mortality or suppression leading to death of naturally regenerating conifer seedlings that were overtopped by shrubs and hardwoods, and it was quite likely that height growth of shrubs had slowed after 9 to 19 years (Brown and Smith 2000) while tree height growth continued to slowly increase. Conifer mortality would remain low and tree height growth would accelerate as individuals continued to emerge above the shrub layer (Conard and Radosevich 1982).

6. Forest Plans Fail to Ensure Large Structures are Protected from Salvage Logging and therefore do not Ensure Ecological Integrity will be Provided

Alternatives B and D do not ensure that any mature conifer forest composed of high densities of large diameter trees that burn at moderate or high severity will be avoided during post-fire salvage logging. As we discussed above, high densities of large diameter snags provide habitat for different post-fire wildlife communities and higher species diversity than areas with small trees that burn at high severity, and provide higher levels of species diversity. The DEIS (p. 218) touches on the importance of large legacy structures:

> The ecological importance of individual legacy structures following a disturbance like fire (such as large snags and logs, resprouting hardwoods, and understory plant diversity) has long been recognized. Recently there has been recognition that their combined presence provides a unique habitat condition that supports early-successional-associated species such as woodpeckers and arthropods (Betts et al. 2010, Swanson et al. 2011), and fire-dependent plants (like knobcone pine). Salvage and reforestation that removes some of elements such as snags and logs, or creates conditions like artificial reforestation may not provide the same level of complexity or habitat for associated species. (Swanson et al. 2011, Noss et al. 2006)

Despite this recognition, the draft plans fail to protect most legacy structures. The forest plans include a guideline to avoid salvage logging 10 percent of the area of large fires with more than 1,000 acres of contiguous blocks of moderate and high vegetation burn severity (TERR-CES-GDL-6), yet such a guideline clearly fails to ensure that any large trees killed in such fires will be avoided by salvage logging activities or that avoided areas are of high ecological value and will be distributed across the post-fire landscape in such a way as to provide habitat connectivity. These issues constitute a failure to provide for ecological integrity and connectivity, violations of the planning rule. Even if this guideline were modified to ensure that 10 percent of dense mature conifer forest that burns at high or moderate severity would be avoided by salvage logging activities, the DEIS and supplemental materials do not provide any background information or analysis that demonstrates or discusses how such a level of avoidance would adequately provide for ecological integrity on its face or compared to other alternatives.

7. Plantation Establishment is a Barrier to Reaching Desired Conditions

The high economic cost of plantation establishment interferes with the use of managing fire for resource benefits. Because plantations are so expensive to establish and are inherently prone to high severity fire, risk adverse-managers will be reluctant to allow plantations to burn under any conditions. When sufficient amounts of unthinned and unmanaged plantations are distributed across the landscape, such a situation results in an inability to use fire for resource benefits across the landscape. The DEIS should address the effects of the amount and spatial arrangement of existing plantations and the establishment of future plantations on the ability to reach prescribed and managed desired conditions.

8. Recommendations

> Natural disturbance events will provide major opportunities for these ecosystems, and managers can build on those opportunities by avoiding actions that (1) eliminate biological legacies, (2) shorten the duration of the [CESFs], and (3) interfere with stand-development processes. Such activities include intensive post-disturbance logging, aggressive reforestation, and elimination of native plants with herbicides. (Swanson et al. 2011)

We provided the Forest Service with a set of CESF plan components to be considered in a DEIS alternative. It is not entirely clear if any of the CESF plan components we provided were included in Alternative C. However, we ask again that the selected alternative include the following plan components:

Plan Component (coarse filter)	**Proposed Language**
Definition	CESF is the stage of forest development following a disturbance in a mature forest that produces significant mortality, generally greater than 50 percent of the basal area. The death of overstory trees creates openings that allow other plants and tree seedlings to reoccupy the site. The CESF stage is characterized by high densities of snags, the development of shrub cover and other native post-disturbance vegetation, downed wood, and natural conifer regeneration. This stage is allowed to develop unassisted except for the use of prescribed fire.
Desired Condition	1) The percentage of the forested landscape that is complex early seral forest habitat is well distributed and within the range of natural variation for fire and other disturbance processes. **Note:** Ecosystem components for each forest type would be based on the best available science information.
	2) The percentage of post-fire areas composed of high severity and moderate severity burned forest is within the range of natural variation to provide complex early seral forest habitat and forest heterogeneity (not including plantations that burn at high severity). **Note:** Ecosystem components for each forest type would be based on the best available science information.
	3) High severity patch sizes and the percentage of the post-fire area composed of larger high severity patches is within the range of natural variation to provide a range of patch sizes that will support viable populations of wildlife that thrive in these habitats (e.g., black-backed woodpecker and other post-fire associated birds).
	4) The duration of CESF stage is moderated only by forest type, site conditions, and appropriate disturbance regimes, and results in a biologically diverse progression of forest development.
	5) Cavities for secondary cavity nesters are sufficiently abundant and well distributed to support birds and other animals that depend on them.
Objective	1) The total amount of complex early seral habitat for each forest type has increased by X percent over 10 years and X percent over 20 years. **Note:** Set values based on current condition and expected disturbance frequencies in the desired conditions for specific forest type.
	2) Fifty percent of the CESF created in the first decade of the plan will be treated with prescribed fire in the second decade of the plan and consistent with the fire regime for the forest type.

Plan Component (coarse filter)	Proposed Language
Standard	1) Except to address hazard trees, no salvage logging, herbicide use to reduce competition with conifer seedlings, or reforestation shall occur in areas that meet the desired conditions for complex early seral forest or are important to sustain wildlife.
	2) Except to address hazard trees, no trees with green needles shall be salvage logged. **Note:** This standard applies to all post-wildfire environments.
	5) Snags and other fuels may be managed in strategic areas identified specifically to provide for firefighter safety as part of a landscape-wide and long-term prescribed fire program.
	6) Outside of strategic areas identified specifically to provide for firefighter safety as part of a landscape-wide and long-term prescribed fire program, no standing dead trees shall be felled or downed wood shall be piled and burned or otherwise removed from areas that meet the desired conditions for CESF or are important to sustain wildlife.
Guideline	1) When salvage logging does occur after meeting desired conditions and accounting for wildlife needs, 20 percent of the area of each unit should be composed of snag retention patches to enhance structural complexity and biodiversity.
	2) Snag retention patches should be designed based on the following criteria: a. Vary the patch sizes from 0.5 acres to 10 acres; b. Shapes of patches should be variable, e.g., circular, elongated or connected stringers; and c. Intervening areas outside of patches would retain trees scattered throughout, specifically 8-10 non-commercial trees (10" to 18" dbh with the upper size determined by commercial value of the tree)
	3) Snag retention patches should be located based on the following criteria: a. Large (greater than 20 inches dbh) pre-fire snags present (e.g., look for the broken tops or hollows); b. Large fire killed (greater than 24 inches dbh) sugar pine, ponderosa pine, Douglas fir present, and followed by other species (in that order of priority); c. Very high density of medium sized snags (12 to 24 inches dbh); and d. Presence of vigorous natural herb/shrub/conifer regeneration.
	4) To address safety, tree falling should be limited to trees within 1.5 tree lengths of roads or other factors that trigger falling of hazard trees. Retain salvaged trees as down wood to meet desired conditions.
	5) Allow natural regeneration to occur within 2,000 feet of green forest.
	6) When necessary, management of competing shrubs in replanted areas should be limited to hand control and prescribed fire.

Plan Component (coarse filter)	Proposed Language
	7) Beyond 2,000 feet and when natural regeneration is not occurring, reforestation should be designed to create founder forests with small planted areas (<2 acres) of variable shape within a larger (10-acre) unplanted area.
	8) When a wildfire or portions of a wildfire meet desired conditions, the Public Affairs Program should identify the benefits of disturbance to wildlife and biodiversity in press materials and on the forest's website.

In addition to our recommended plan components, others have also made recommendations on CESF management that should be considered by the Forest Service in alternative selection. In a recent report commissioned by the Forest Service on avian use of post-fire areas, Fogg et al. (2016) suggest the following CESF management recommendations based on "a synthesis of our results, scientific literature, and expert opinion from 15 years of studying birds in the Sierra Nevada":

- Consider post-fire habitat as an important component of the Sierra Nevada ecosystem that maintains biological diversity.
- Consider the area of a fire that burned at high severity, as opposed to the area of the entire fire, when determining what percentage of the fire area to salvage log. Consider the natural range of variability for high severity patch size, as not all of these areas should be targeted for salvage logging.
- Consider the landscape context (watershed, forest, and ecosystem) and availability of different habitat types when planning post-fire management actions.
- Approach post-fire management through a climate-smart lens - use the past to inform but plan for the future – find solutions that promote resiliency and foster adaptation.
- Use existing climate predictions of vegetation communities to guide reforestation locations and species mixes, but be mindful of remaining uncertainties regarding the rate of species' range shifts. Favor fire-tolerant species and consider whether lower elevations on south-facing slopes should be planted with conifers.
- Monitor, evaluate, be patient, strategic, and constrained in aiding the recovery of a post-fire landscape.
- Manage a substantial portion of post-fire areas for large patches (20–300 acres) burned at high severity as complex early seral forest for wildlife.
- Retain high severity burned habitat in locations with higher densities of medium to larger diameter trees.
- Retain high severity patches in areas where pre-fire snags are abundant as these are the trees most readily used in the first three years after a fire by cavity nesting birds.
- Retain snags in salvaged areas in far greater densities than green forest standards and retain snags in dense clumps.
- Snag retention immediately following a fire should aim to achieve a range of snag conditions from heavily decayed to recently dead in order to ensure a long lasting continuous source of suitable cavity and foraging trees.

- When reducing snags in areas more than five years post-fire, snag retention should favor large pine and Douglas fir, but decayed snags of all species with broken tops should be retained in recently burned areas.
- Consider that snags in post-fire habitat are still being used by a diverse and abundant avian community well beyond the 5 to 10 year horizon of Black-backed Woodpeckers.
- Retain snags (especially large pine trees that decay slowly) in areas being replanted as they can provide the only source of snags in those forest patches for decades to come.
- Consider retaining smaller snags in heavily salvaged areas to increase snag densities because a large range of snags sizes are used by a number of species for foraging and nesting from as little as 6 inches DBH. Though, most cavity nests were in snags over 15 inches DBH.
- Manage post-fire areas for diverse and abundant understory plant community including shrubs, grasses, and forbs. Understory plant communities provide a unique and important resource for a number of species in conifer dominated ecosystems.
- Most shrub patches should be at least 10-15 acres and shrub cover should average over 50% across the patch acreage. Within the shrub patch, manage for denser clumps (>70%) in order to support area-sensitive species such as Fox Sparrow.
- Retain natural oak regeneration with multiple stems as these dense clumps create valuable understory bird habitat in post-fire areas 5–15 years after the fire.
- In highly decadent shrub habitat consider burning or masticating half the area (in patches) in one year and burning the remaining area several years later once fuel loads have been reduced. Treatments should be done outside of the breeding season (August – April).
- Maximize the use of prescribed fire to create and maintain chaparral habitat and consider a natural fire return interval of 20 years as the targeted re-entry rotation for creating disturbance in these habitat types.
- Limit replanting of dense stands of conifers in areas with significant oak regeneration and when replanting these areas use conifer plantings in clumps to enhance the future habitat mosaic of a healthy mixed conifer hardwood or pine-hardwood stand.
- Consider managing smaller burned areas (<5000 acres) and substantial portions of larger fires exclusively for post-fire resources for wildlife especially when there have been no other recent fires (within the last 10 years) in the adjoining landscape.
- Retain patches of high severity burned areas adjacent to intact green forest patches as the juxtaposition of disparate habitats is positively correlated with a number of avian species, including those declining such as Olive-sided Flycatcher, Western Wood-Pewee, and Chipping Sparrow.
- Incorporate fine scale heterogeneity in replanting by clumping trees with unplanted areas interspersed to create mosaics that will invigorate understory plant communities, increase natural recruitment of shade intolerant tree species, and help reduce future fire risk.

- Plant a diversity of tree species where appropriate, as mixed conifer stands generally support greater avian diversity than single species dominated stands in the Sierra Nevada.
- Consider staggering plantings across decades and leaving areas to naturally regenerate in order to promote uneven-aged habitat mosaics at the landscape scale.
- Consider fuels treatments to ensure the fire resiliency of remnant stands of green forest within the fire perimeter. These areas increase avian diversity within the fire and the edges between unlike habitats support a number of species (e.g. Olive-sided Flycatcher).
- Avoid planting conifer species in or adjacent to riparian areas (dependent on riparian corridor size), primarily in the floodplain, to avoid future shading of riparian deciduous vegetation from the south or west, and increased competition.
- Consider replanting riparian tree species (cottonwood, willow, alder, aspen) in riparian conservation areas affected by stand replacing fire where natural regeneration is lacking.

III. Aquatic and Riparian Ecosystems

In 1996, the Sierra Nevada Ecosystem Project found that "aquatic /riparian systems are the most altered and impaired habitat in the Sierra Nevada" (Centers for Water and Wildland Resources 1996, p. 8). The Forest Service in 2001 responded to this call to arms by amending the plans for eleven national forests in or adjacent to the bioregion to establish an aquatic management strategy that included goals, land allocations, objectives, standards, and guidelines. The integrated aquatic management strategy has been lost in the draft forest plans and replaced with plan components for "Watershed Conditions," management strategies for "Riparian Conservation Areas" and "Critical Aquatic Refuges," and a reference to priority watersheds, but the draft plans do not describe an integrated approach to the management of aquatic resources. An integrated aquatic management strategy should be a featured element in each forest plan to guide the conservation of aquatic resources, to ameliorate threats, and respond to changing climate.[5]

We ask that you revise the draft plans to include an aquatic conservation strategy as a central focus of the forest plan.

A. Meadow Ecosystems

We appreciate that a number of plan components beneficial to meadow ecosystems in the existing forest plans were retained in the draft forest plans. We are however concerned that neither the draft plans nor the alternatives provide direction for ecologically sustainable management that promotes meadow health and ecological integrity.

[5] We also asked in our scoping comments that an aquatic conservation strategy be developed as a central element to the revised forest plans. The DEIS (p. 43) claims that such a strategy is part of Alternative A and need not be considered as a separate alternative. We see this as validation that the Alternative B, offered as the proposed action an integrated and well defined, aquatic strategy.

We ask that you revise the draft plans to include standards and guidelines that: 1) manage livestock grazing on federal lands in a way that protects existing meadow aquatic and riparian resources, habitats and species; 2) enable the recovery of resources, habitats, and species from legacy impacts and do not slow or impede their recovery from such impacts; and 3) buffer them against future threats such as those posed by climate change.

1. The Draft Plans Do Not Meet the Purpose and Need in Notice of Intent for Improving Grazing Management and Range Condition

The Notice of Intent stated that:

> There is a need to modify plan direction for aquatic and riparian ecosystems to maintain or improve the resilience of these ecosystems to climate change, fire, air pollution, and invasive species, and to manage meadows holistically across individual resources areas, such as hydrology, soils, wildlife, and vegetation.

(NOI, p. 51537) and:

> Desired conditions would be updated for meadows to reflect an integration of vegetation, soils, hydrology, and wildlife conditions. Guidelines would be added to address the ecological integrity of meadows and their connection to groundwater. (NOI, p. 51540)

Based on these statements we expected to see new management direction in the draft forest plans to address the ecological integrity of meadow systems and to manage these ecosystems holistically. Unfortunately, the draft plans appear to include only changes to desired conditions and no revised management direction, i.e., standards and guidelines, to improve meadow management. We also highlighted in our scoping comments the need to improve management direction for meadow ecosystems due to the existing poor health noted in the forest assessments for many meadows.

We ask that the draft plans be revised to include standards and guidelines to address the ecological integrity of meadows and that a revised DEIS be circulated for review and comment. We also ask that revised draft plans and DEIS address the comments below.

2. Draft Forest Plans Provide Less Protection for Meadows than the Current Plans

The draft plans allow management to continue to adversely affect meadows and special aquatic features that are not properly functioning whereas the existing forest plans require that these features be properly functioning. Standard and guideline 117 in the current forest plans requires:

> Assess the hydrologic function of meadow habitats and other special aquatic features during range management analysis. Ensure that characteristics of special features are, at a minimum, at Proper Functioning Condition, as defined in the appropriate Technical Reports (or their successor publications): (1) "Process for Assessing PFC" TR 1737-9 (1993), "PFC for Lotic Areas" USDI TR 1737-15 (1998) or (2) "PFC for Lentic Riparian-Wetland Areas" USDI TR 1737-11 (1994). (USDA Forest Service 2004, p. 65)

This means that for those meadow habitats and other special aquatic features, action must be taken to prevent such features from becoming not functioning and to restore features to the condition of functioning. Management activities that contribute to the condition of not properly functioning or impede the recovery to a properly functioning condition (PFC) would need to be modified or halted to "ensure" that PFC is met. By comparison, the draft plans allow for meadows and other special aquatic features to be not properly functioning as long as it is trending toward this condition. For example, the draft SNF plan states:

> MA-RCA-STD 11
> Assess the hydrologic function of meadow habitats and other special aquatic features during range management analysis. Ensure that characteristics of special features are, at a minimum, at proper functioning condition **or at functioning at-risk and trending toward proper functioning condition**, as defined in the appropriate technical reports[6,7,8,9]. (Sierra draft plan, p. 61)

This is a far more permissive standard that allows grazing to impact meadow habitats and other special aquatic features that are not properly functioning.

This change is especially damaging to sensitive meadow resources since a significant proportion of the meadows and special aquatic features that have been evaluated are not properly functioning on the Inyo and Sierra national forests.[6] According to the Inyo forest assessment (USDA Forest Service 2013a, p. 131), 47 percent of meadows sites and 41 percent of stream reaches within grazed allotments are not properly functioning. No information is reported for "other special aquatic features" for the Inyo National Forest. The Sierra forest assessment (USDA Forest Service 2013c, p. 133) does not distinguish between meadows and other special aquatic features, but reports that 45 percent of these features combined are not properly functioning.

We ask that you remove the phrase "or at functioning at-risk and trending toward proper functioning condition" from this standard in each draft plan.

3. Direction in the Existing Forest Plans Does Not Provide for the Ecological Integrity of Meadows

Information about meadow conditions provided in the forest assessments indicates that a significant number of monitored sites in actively grazed allotments do not meet the current forest plan standards or desired conditions. As noted above, 45 to 47 percent of the meadows or other special aquatic features within grazed allotments on the Sierra and Inyo national forests, respectively, are not properly functioning and 41 percent of the stream reaches in grazed allotments on the Inyo national forest are also not properly functioning. The data presented in the assessments and the DEIS also indicates that there are problems with vegetative condition in actively grazed allotments. On the Inyo National Forest, vegetation condition is less than desired condition on 30 percent of the meadow sites evaluated and 18 percent of the upland sites

[6] We note that no PFC evaluation data was reported in the Sequoia forest assessment. We conclude from this that the data does not exist.

evaluated (USDA Forest Service 2013a, p. 130). On the Sierra National Forest, 43 percent of the sites evaluated for vegetative condition had a functional rating of less than 50 meaning that they were less than the desired late seral status (USDA Forest Service 2013c, p. 129-130). Lastly, on the Sequoia National Forest, vegetative condition was less than desired on 13 percent of the sites (USDA Forest Service 2013b, p. 142).

Information presented in the forest assessments also shows that grazing utilization standards are not being met on all allotments. Between 2002 and 2011 as many as 21 percent of the areas monitored on the Sierra National Forest did not meet the utilization standards meaning that they had a lower stubble height or greater percent utilization than allowed by the standard (USDA Forest Service 2013c, p. 134). This information also indicates that in most years fewer than half of the identified key areas are monitored and in one year, 2011, only 13 percent of the key areas were monitored. Similarly, for the Inyo National Forest and for the same time period, as many as 21 percent of the areas monitored did not meet the utilization standard (USDA Forest Service 2013d, p. 99). This information also indicates that in most years fewer than 36 percent of the identified key areas are monitored and in one year, 2008, only 3 percent of the key areas were monitored. The utilization monitoring for the Sequoia National Forest covered more key areas, yet still had up to 11 percent of the sites that exceeded the utilization standard (USDA Forest Service 2013b, p. 145).

The condition of these meadows after 15 years under the existing management direction indicates that the current standards and guidelines are not adequate to provide for the ecological integrity of these ecosystems. Further, the system of monitoring key areas is not adequate to prevent over utilization or to ensure that the standards are met and not exceeded. These results support the need to revise the existing standards and guidelines for grazing in meadows to constrain this activity in order to achieve and maintain desired conditions and to avoid undesirable effects, as directed by the planning rule. Revised standards and guidelines are necessary to provide for the ecological integrity of these meadow ecosystems.

4. Analysis in the DEIS Does Not Consider Poor Meadow Conditions or the Impacts on Meadows from Livestock Grazing

The DEIS provides some information on the vegetative conditions in meadows, but does include information from the assessment on proper functioning condition or other indicators of health. We ask that the existing poor conditions noted in the assessments, both vegetative condition and properly functioning condition of riparian areas, be addressed in the DEIS. We also ask that the effects of the alternatives on these special aquatic features that are not properly functioning or where vegetative conditions do not meet desired be evaluated. The analysis in a revised DEIS must also address the failure of the current direction in the forest plans to "ensure" that meadows and other special aquatic features are properly functioning and within desirable vegetative conditions.

We also ask that these analyses be used to develop revised standards and guidelines to ensure that the desired conditions are met for meadow ecosystems and that management activities do not impede the progress of the attainment of desired conditions.

5. The Analysis in DEIS Fails to Evaluate the Impacts of Grazing on Bank Disturbance, Loss of Riparian Shrubs and Meadow Drying

Neither the DEIS or the forest assessments provide any information on the status and trends related to bank disturbance or loss of riparian shrubs despite the inclusion of specific standards in the existing and draft plans. Excessive bank disturbance can degrade riparian ecosystems and result in lowered water tables in meadows and lead to drying. Hedging of riparian shrubs and loss of a variety of age-classes reduces important structural complexity in meadows. Wet meadow systems with well-developed riparian shrubs are essential ecological conditions for at-risk species such as willow flycatcher.

These conditions should be evaluated in the DEIS and measures proposed in the draft plans to ensure that the plan results in conditions that provide for ecological integrity.

6. Plan Components for Meadows Are Not Clearly Defined and May Not be Internally Consistent for the Sierra Draft Pan

The grazing standards for the draft plan for the Sierra National Forest are presented in several places and use different terminology among standards. For instance, MA-RCA-STDs 14 through 17 identify specific ecological conditions, e.g., seral status and ecological status (Sierra draft plan, pp. 62-63). In contrast, RANG-FW-STD 6 through 11 cover many of the same habitat types, but introduce the term "satisfactory condition," a term linked in the glossary to vegetative condition ratings of poor, fair, good and excellent. It is not clear how these vegetative conditions relate to the "seral status" and "ecological status" mentioned in the standards for riparian conservation areas. The monitoring program is also not helpful in clarifying the terminology since the assessment indicators for the relevant desired condition (RCA-MEAD-DC-05) again use different terminology, i.e., "Range condition class; species richness; species diversity; and plant functional groups" (e.g., Sierra draft plan, p. 112). These standards and the monitoring indicators should all reflect the same terminology and be clearly related to each other.

7. Plan Objectives Should Not Merely Maintain Status Quo Conditions

We appreciate the inclusion of several objectives that address riparian and aquatic ecosystems. MA-RCA-OBJ 01 appropriately focuses on restoring conditions, however two other objectives (RCA-MEAD-OBJ 01 and RCA-RIV-OBJ 01) each allow actions to be counted toward the objective if they merely "maintain" existing conditions. We ask that you revise the objectives to eliminate maintaining the status quo and focus on enhancing or improving conditions.

8. Increased Protection Is Needed for Fens

We know of no ecological benefit that grazing confers to fens. Grazing should be removed from within and around all fens managed by the Forest Service in order to protect the hydrologic conditions necessary to maintain species that are dependent upon properly functioning fen habitat.

Guidelines for Riparian Conservation Areas (RCAs) in the Sierra and Sequoia draft plans include Guideline MA-RCA-GDL 15 which reads:

> If meadow ecological status is determined to be moving in a downward trend, modify or suspend grazing.

This guideline should be amended in both Plans to read:

> If meadow or fen ecological status is determined to be moving in a downward trend, modify or suspend grazing.

Guidelines (MA-RCA-GDL) 14-17 that appear in both the Sierra and Sequoia draft plans (pp. 62-63 in both plans) are omitted from the Inyo draft plan (see pp. 62-63). The DEIS fails to provide a science-based rationale for omitting these guidelines from the Inyo draft plan. The need for monitoring and remedial actions related to grazing in Riparian Conservation Areas apply to all three forests and therefore these guidelines should appear in all three Plans, after having amended guideline 15 as described in the paragraph above.

Standards for RCAs include MA-RCA-STD 12 which states:

> Prohibit or mitigate ground-disturbing activities that adversely affect hydrologic processes that maintain water flow, water quality, or water temperature critical to sustaining fen ecosystems and the plant species that depend on these ecosystems…Complete initial inventories of fens within active grazing allotments prior to re-issuing permits. If more than 10 fens occur on an allotment, ensure 25 percent of all fens are inventoried, and establish a 5-year schedule to complete inventory. (Inyo draft plan, pp. 61-62; Sierra draft plan, p. 62; Sequoia draft plan, p. 62).

Directions in this standard are unclear. Is the 5-year schedule part of the initial inventory to be completed *prior* to the re-issuance of permits? How long are permit terms? Will there be additional surveys required to monitor trends and conditions within allotments during the permit term to determine whether or not ground-disturbing activities are adversely affecting fen ecosystems and dependent plant species?

Since the DEIS (p. 270) states:

> …the exact number of fens on each of the three national forests is not known and no consistent assessment exists,….

we assume "ensure 25 percent of all fens…inventories" refers to all fens within an allotment where > 10 fens occur, and not all fens in each forest. This should be clarified. The Plan and DEIS fail to provide a rationale for why or how 25% of fens within an allotment provide a suitable indication of grazing effects to fens within the allotment. What is the basis for relying on 25% rather than say, 100%? If grazing occurs on fens, inventory and monitoring of all impacted fens is required.

9. Providing for Ecological Integrity of Meadow and Fen Ecosystems in the Revised Forest Plans

Meadow ecosystems in these forest plan areas are a finite resource of an exceptionally high ecological value. The threat to these systems from past and ongoing management activities combined with the warming and drying experienced with the recent drought and expected in the future with changes in climate trends is recognized to be extreme (Long and Pope 2014). There is little question in the scientific community that without a change in conservation and management, these critical and essential ecosystems could be significantly degraded or lost (Viers et al. 2013). It is for these reasons that the revised forest plans need to enhance conservation of these ecosystems and provide direction to ensure their ecological health.

The draft plans set an inappropriately low standard for ecological status and allow activities that impede the improvement of meadow conditions. Standards and guidelines should be developed to limit or prohibit activities, e.g., livestock grazing, in meadows that are in less than excellent condition or not in properly functioning condition. Plan components should also be designed to maximize an upward trend towards these conditions in places where they are not now met.

We recommended standards and guidelines for grazing in our scoping comments and provide the following additional recommendations here:

- Adjust timing and duration of livestock use in areas where aquatic, riparian and wet meadow resources are maintained, protected, or enhanced. Timing should occur when soil conditions are dry (e.g. late summer/fall) and result in "light" utilization. Areas of sensitivity include:
    - Perennial or seasonal bankfull channel and floodplain,
    - Perennial saturated meadow areas dominated by shrubs, grasses, and forbs
    - Seeps, springs, fens, swales and other unique wetted features or areas
    - Perennial or seasonal flow paths with active head cuts
- Estimate stock capacity based on available area and forage estimates that exclude wet meadow, riparian areas, perennial and seasonal stream channel and floodplains, seeps, springs, fens, swales and other unique wetted features or areas
- Provide and maintain exclusion fencing in all actively grazed areas preventing cattle from accessing aquatic, riparian, and wet meadow resources; install fencing surrounding meadow systems that extend to 100-year flood prone areas so that livestock can be managed during sensitive time periods
- Provide off-channel water troughs/ sources outside of exclusion fencing
- Utilize salting, herding, water developments, fencing and riding, to improve livestock distribution and minimize impacts to riparian/meadow areas
- Provide and maintain exclusion fencing of aquatic, riparian, or wet meadow areas that support sensitive species
- Provide and maintain exclusion fencing in key areas of potential ingress from active allotments into rested allotments. Monitor and assess grazing levels to ensure that grazed areas are not exhibiting signs of erosion and incision, hummocking, water quality impacts, and over utilization of palatable species:

- Develop a collaborative resource management team for grazing issues that includes botanists, hydrologist, fisheries biologists and other non-range specific experts
- Create thresholds and triggers for management response to address impacts of grazing if allotments are reopened. Monitor trail formation and eliminate trails that disrupt the natural flow of water across meadows
- Ensure stock do not disrupt spawning and rearing reaches of associated native fishes
- Utilize vacation of allotment or rest-rotation as a mechanism to accelerate the recovery or riparian meadows and streams. For example Herbst et al (2012) found that removal was effective in rapid recovery of aquatic habitat values but fencing was ineffective.

B. Critical Aquatic Refuges

Critical Aquatic Refugees (CARs) were adopted in the forest plan amendments in 2001 as a new land allocation to complement the aquatic management strategy adopted at that time. These land allocations were defined as:

> … subwatersheds, generally ranging between 10,000 to 40,000 acres,
> with some as small 500 acres and some as large as 100,000 acres, that contain either:
> - known locations of threatened, endangered, or sensitive species,
> - highly vulnerable populations of native plant or animal species, or
> - localized populations of rare native aquatic- or riparian-dependent plant or animal species. (USDA Forest Service 2001a, p. A-51)

The plan amendments allowed the boundaries to be "refined based on the findings from conservation assessments or verification of the presence and condition of habitat for threatened, endangered, and sensitive species. Additional CARs could be added by individual national forests (USDA forest service 2001a, p. A-51). The CARs were designed to offer opportunities to better protect vulnerable aquatic species in addition to protecting subwatersheds with high aquatic-associated species diversity.

The foundation for the original CARs is based on the same principles used by Trout Unlimited to develop recommendations on additions to the original, existing system of CARs. Their general analysis approach involved:

- Quantifying at-risk and vulnerable aquatic species diversity by subwatershed based on the most up-to-date species occurrence data;
- Quantifying relative aquatic habitat integrity (i.e., roads, dams, mining, agriculture, etc.)
- Quantifying relative climate change risk and wildfire risk; and
- Combining these products and overlaying existing critical aquatic refuges (CAR) and other protected areas to identify gaps in the existing protected areas and opportunities for strengthening that network, especially through aquatic habitat connectivity

We submitted in our scoping comments their recommendations on additions to the CAR system with the methodology and rationale for inclusion, and asked that they be incorporated into the draft plans. The DEIS (p. 42) dismisses the consideration of the submitted CARS in an

alternative and claims that the areas are substantially similar to the areas delineated by the Forest Service and proposed in Alternative C.[7]

A significant difference between the CARs we submitted in scoping and those delineated by the Forest Service and included in Alternative C relates to location with respect to Wilderness Areas. All of the CARs added in Alternative C are limited to areas within Wilderness Areas. The addition of these CARs will have little effect on management since limited management occurs in Wilderness Areas. Critically important areas in areas outside of Wilderness Areas, especially in lower elevations, were identified in our recommendations.

The draft plans, DEIS and planning documents posted on the Forest Service website lack information that is critical to the evaluation of the CARS identified by the Forest Service. These documents do not include an explanation of the methodology used to delineate the new CARs, do not contain information to describe the values in the existing CARS and do not provide information describing the values of the proposed CARs. This information on the methodology used to delineate the CARs and their values is critical to include in the revised forest plan as a means to inform future project planning and to develop mitigation measures, and prioritize restoration opportunities. This information is also of critical to the evaluation of the importance to include these areas and should be provided in the DEIS.

We note that elsewhere the Forest Service has identified and created watershed networks to support conservation of aquatic biodiversity. Key watersheds were created in the region covered by the Northwest Forest Plan. These watersheds were identified as important refugia or strongholds for native salmonids and a component of that region's aquatic conservation strategy. The Flathead National Forest recently issued a draft forest plan that includes a "conservation watershed network" defined as "a collection of watersheds where management emphasizes habitat conservation and restoration to support native fish and other aquatic species." Further, the planning team in that region found that "Conservation Watershed Networks represent the best long-term conservation strategy for native fishes and their habitats"

We ask that all the CARs provided in our scoping comments be incorporated into revised plans, especially the additions in low elevation areas or areas outside of existing alternative designations (e.g., wilderness areas) so that the designation creates strong conservation outcomes. We also ask that the DEIS be revised to evaluate the effects, including beneficial effects, of their inclusion and that CARs be evaluated based on species diversity and vulnerability of aquatic-associated species in combination with human, fire and climate change stressors.

C. Water Drafting Standards in the Existing Sierra Forest Plan

The existing Sierra forest plan includes specific standards to ensure that adequate steam flows are provided when water is drafted from streams. The current direction is:

43. When watering roads for dust abatement, protect fishery streams by:

[7] The DEIS indicates that an evaluation of the submitted CARs in contained in the project file, but despite numerous requests to review the project file no project file was provided by the Forest Service.

a. Allowing no drafting unless immediate downstream discharge from drafting site is maintained at l.5 cfs or greater
b. Permitting water drafting to remove no more than 50% of any stream's ambient discharge that is over 1.5 cfs.
c. Allowing no drafting in or above stream reaches supporting pure populations of Lahontan cutthroat trout. (USDA Forest Service 1991b, p. 4-15)

The draft forest plan eliminates this standard and adds the following generic standard:

> MA-RCA-STD 06 Locate water drafting sites to minimize adverse effects to in stream flows and depletion of pool habitat. (Sierra draft plan, p. 61)

The DEIS makes no mention of this change and does not evaluate the effects of omitting this standard. Please address in the DEIS how this change will better protect water and habitat quality for fish and other aquatic organisms.

D. Priority Watersheds Are Not Identified in the Plan

The planning rule directs that "Every plan must: (i) Identify watershed(s) that are a priority for maintenance or restoration" (36 CFR 219.7). These draft plans, however, make only a generic reference to priority watersheds and an analysis process used to delineate these areas, directing the reader to a national website to view their mapped locations. No information is provided in the plan about the location of the priority watersheds, how many have been identified, the basis for inclusion, or the restoration actions proposed for these areas. The level of detail and information provided in the draft plans does not meet the direction that the plans "must" identify watersheds that are a priority for restoration. Beyond the lack of compliance with direction in the planning rule, failing to identify the priority watersheds in the forest plans makes no "planning sense." The forest plan is the reference for setting priorities and developing project/restoration plans. Information in the plan, including its appendices, supports the future work on the forest and informs the general public and potential partners about the Forest Service's intent to protect and restore at-risk or sensitive resources.

We ask that you identify the priority watersheds for each national forest in their respective plans, describe the reason for inclusion and identify the restoration actions anticipated for each priority watershed. These can all be described in a manner that makes clear that the delineated areas and anticipated actions are not commitments to complete a project and that project-level review and analysis in compliance with NEPA would be completed for all actions. Further it can be made clear that priority watersheds may change in the future without plan amendment based on completion of restoration actions, changed circumstances and other factors.

E. Range Management, Affected Species, and Affected Water Resources

It is solely within the Forest Plan revision process that individual national forests undertake any forest-wide assessment of range management, including consideration of which acreage is truly capable and suitable for grazing, or whether grazing may be appropriate to continue in certain areas based on other management objectives. The plan revision process is the appropriate time

to address programmatic adjustments to range management that consider the best available science information and the requirements of the Planning Rule to provide for ecological integrity and for the diversity of plants and wildlife in the plan areas.

Allowing grazing permittees to bring livestock onto public land to consume vegetation without consistent herding or management is a long-established agency practice. As one of the multiple uses of public land, livestock grazing has consistently been shrugged off as a status quo activity without being given close scrutiny as to the extent of damage that grazing actually causes for critical wildlife habitat, water resources, watershed health, or sensitive plant species.

As previously noted in the section of these comments on Aquatic and Riparian Ecosystems, in 1996 the Sierra Nevada Ecosystem Project found that "aquatic /riparian systems are the most altered and impaired habitat in the Sierra Nevada" (Centers for Water and Wildland Resources 1996, p. 8). Because water resources are so highly valuable for humans and the forest ecosystem, the Region and individual national forests have shared positive intentions to promote ecological restoration, especially for imperiled aquatic habitat and watersheds on national forest lands in the Region.

In contrast to good agency goals and intentions, since the release of the SNEP Report, new scientific studies and solid evidence have raised significant concerns about water quality impacts tied to livestock presence along national forest streams. Due to cumulative impacts to declining amphibian species, the U.S. Fish and Wildlife Service in recent years listed three Sierra Nevada amphibians -- all three of which utilize aquatic habitat that is often degraded or altered by livestock permitted to graze on national forest lands. Environmental watchdog organizations have undertaken extensive field monitoring and have submitted annual photo reports to the Forest Service showing significant deleterious effects to meadows and special aquatic features that are supposed to be protected based on regional direction.

The following comments focus primarily upon Range Management in the three draft forest plans as well as associated effects of range management on amphibian species and affected water resources. We ask that you revise the draft plans to correct the deficiencies identified in these comments and that each Forest respond to the gaps in management direction that are highlighted in these focused comments.

1. Forest Plans Fail to Respond to Resource Impacts Caused by Livestock

As reflected by the draft Forest Plans and the EIS, there is a clear reluctance by the three Forests to address range management issues or the suitability of grazing in many sensitive areas or at sites where water resources may be significantly affected. Based on the draft Forest Plans and the EIS, there is failure by the Forest Service to even acknowledge that current range management can have a significant impact on meadow, wetland, and watershed health.

The following paragraph from the Sierra and Sequoia Assessments shows the strong bias towards minimizing or dismissing the adverse impacts of grazing that has been carried forward in the new Forest Plans:

> Vegetation changes occur as a result of many factors other than grazing, and disturbance is a natural feature of plant communities (Ruyle and Dyess 2010). .... Grazing is not necessarily a primary driver of vegetation change and even when grazing has been the cause of vegetation change, current levels of grazing may be inconsequential and even completely removing grazing will not always result in a return to historical conditions (Westoby et al. 1989). Some, perhaps many, altered plant communities can no longer achieve what may have once been a historic condition because of lack of a current seed source, the presence of highly competitive and sometimes exotic introduced plant species and/or changes in soil characteristics limiting species adaptation to the site. These situations are considered state changes in vegetation (Bestelmeyer et al. 2004, 2009, Briske et al. 2008). If current vegetation is a result of climate and disturbance to date, it may be unrealistic to expect vegetation to return to historical conditions especially in the face of global climate change. (e.g., Sierra forest assessment, p. 129; Sequoia forest assessment, p. 141)

It is inconsistent with countless scientific studies to suggest that historic livestock impacts have not been a significant contributor to current legacy meadow damage. It is also highly debatable for the agency to suggest that recent or current livestock effects are not a cumulative contributor, or in many cases, a significant contributor, to current negative conditions at low-functioning meadows or degraded special aquatic features. Just because the three Forests may lack detailed data on how current grazing practices are affecting meadow ecological conditions, doesn't mean that keeping grazing at a status quo is acceptable. Instead the onus should be on each Forest to truly assess the condition and trend of meadows and special aquatic features on their respective Forest, and to adjust management strategies to allow conditions to move in an upward trend.

Despite the reluctance of the three Forests to recognize the impacts of grazing on meadow and riparian health, there are many National Forest documents that go into depth on the issues that current livestock practices can have on these vulnerable ecosystems. In GTR-84, author Ratliff shares information such as "Overgrazing may accentuate the ill effects of rodent use, create conditions favorable to lodgepole pine invasion, alter meadow-fire relationships, and accelerate erosion"(Ratliff 1985, p. 26); "Defoliation of meadow species by grazing animals is regarded as a major cause of meadow deterioration and of rangeland in general" (*Id.*, p. 27), and "preferential grazing is a major cause of range deterioration (Hormay and Talbot 1961). This practice, when combined with too severe or too frequent defoliation, eventually reduces abundance of the preferred species" (*Id*., p. 28).

Long et al. (2014) found that "Both direct effects (such as trampling) and indirect effects (reducing vegetation) of grazing on streambanks and channels within the riparian zone remain critical considerations for meadow resilience because of their potential to induce stream incision and other threshold changes" (p. 351). "Channel incision can cause a profound loss of productivity in wet meadow ecosystems. Shields et al. (2010) described incision as a syndrome that threatens many ecosystem services ... Causes of incision may be natural, ... or resulting from more specific human actions, such as ... overgrazing that removes protective vegetation or substrates from stream channels" (p. 344-345). "The ecological benefits of grazing-based

management approaches to less invaded, high-elevation wet meadows of the Sierra Nevada are less clear. A report by the Sierra Nevada Ecosystem Project indicated that it was unknown whether grassland ecosystems in the Sierra Nevada were adapted to disturbance by prehistoric megafauna..." (p.351). "Both direct effects (such as trampling) and indirect effects (reducing vegetation) of grazing on streambanks and channels within the riparian zone remain critical considerations for meadow resilience because of their potential to induce stream incision and other threshold changes," (p. 351), and "[Studies done] reported greater macroinvertebrate diversity and measures of habitat quality after 4 years of rest from grazing at the allotment scale, but more limited differences within local riparian exclosures that had been in place over a decade" (p.353).

Clearly the National Forest on the regional level recognizes research that describes and verifies the long term and lasting effects that poor management and movement of livestock grazing can have on meadow and riparian ecosystems, as well as the need to evaluate meadow conditions and trends using thorough, geographically large, and long term monitoring.

a. The Draft Plans Rely on Flawed Determinations to Evaluate Overall Conditions of Meadows

The Draft Forest Plans for the early adopter Forests state that the desired outcome of rangeland management activities is to "sustain biological diversity and ecological processes" (Sierra draft plan, p. 40; Inyo draft plan, p. 37) and that grazed areas of the forests trend "toward having satisfactory soils, functional hydrology and biotic integrity" (Sierra draft plan, p. 41; Inyo draft plan, p. 37). This assessment determination is incorrect for a variety of reasons.

As noted in in the Final Sierra-Nevada Bio-Regional Assessment: "Studies are lacking in the bio-region that include sufficient information on grazing intensity, utilization, duration, and timing, and ecological variation to draw conclusions about current conditions in meadows as related to different levels of grazing (Long et al. 2013)" (p.90). The report goes on to suggest, that across the Sierra Nevada, many of these indicators were out of the range of normal variability (up to 65%). In addition, the report also describes studies that indicate that total area of meadows has decreased and that the number of meadows with channel incision is increasing within the Sierra Nevada (Final Sierra Nevada Bio-Regional Assessment, page 86, 90).

The current study that each Forest has cited for determining the current condition of their Forest's meadows is the ongoing long term plot monitoring work being done by Region 5 Range staff in cooperation with UC Davis Rangelands Watershed Lab. Using this study for the purpose of determining the overall trend of meadow health is flawed for a multitude of reasons:

- This long-term study is broad in geographical distribution (Sierra Nevada wide) but limited in the number of actual meadows that are being assessed for their long term condition (496 plots throughout the whole Sierra Nevada, 64 plots in the Sierra (Sierra NF Assessment, p. 128-129), 57 that are in the Sequoia (Sequoia NF Assessment, p. 141), and an unknown number for the Inyo (not disclosed)). Although none of the Forests share an estimation of how many meadows are found in their boundaries, it is highly likely that there are significantly more meadows than 50-70 meadows in each forest. For example in

the Sierra Forest Assessment in the discussion of a study on conifer encroachment in two planning areas within the Forest, 119 meadows were part of that study alone (p.132). That is a small indication of the number of meadows that are likely found in each national Forest. There are likely hundreds of meadows (at least) in every Forest, and it is improbable that a meadow study with 50-70 plots established per Forest, that are 15 meters by 20 meters in size each (UC Davis Rangelands Watershed Lab website) will provide the comprehensive analysis of overall meadow trends that will indicate the impact of current grazing management activities.

- It is worth pointing out that the long-term study refers to meadow plots, not meadows. The study has 1-3 plots established per meadow. This means that there are actually fewer meadows than the number of sites in the study.

- Additionally, although the Forests state that on the Sierra NF, 60 sites (Sierra Assessment, p. 129) have been visited every 5 years, and on the Sequoia NF, 51 sites (Sequoia Assessment, p. 142) have been visited every five years since the beginning of the study in 1999, the results page on the UC Davis Rangelands Watershed Lab site indicate that at least half of those meadow plots in each Forest were surveyed no more frequently than 8 years apart. The site also discloses that only "246 sites [of the 496 Sierra Nevada plots] have been re-read over the past 10 years, across 127 grazing allotments" making it even appear very unlikely that of the 246 sites that have been re-read in the Sierra Nevada that over 150 of the sites revisited were in the three early adopter Forests.

- Using the UC Davis Rangeland Watershed Lab is utilizing a clearly biased source for analyzing the data that is being collected. A brief survey of their website will reveal that the majority of the research that comes from the Lab favors the ranching and livestock industry. On the Lab's "Meadow Conditions on National Forest Grazing Allotments" page that discusses the analysis the Lab is doing based on the long term monitoring plot info being provided by the Forest, they share that they believe "there is extensive evidence that range livestock production does not necessarily lead to riparian or water quality degradation." The page then cites four sources for that statement, two of which are authored by the lead contact for the analysis effort (Roche). After all the documentation that the Pacific Southwest Region has provided on livestock damage to meadows in their General Technical Reports, it is both biased and legally vulnerable for the agency to have selected a research group with such a clear partiality towards the livestock industry to analyze the data.

On the Stanislaus NF, over more than two decades of field monitoring combined with active research, the Central Sierra Environmental Resource Center (CSERC) has demonstrated through meadow utilization monitoring, photo points, and stream water quality data that grazing practices can lead to severe degradation of meadows and riparian areas through soil compaction, stream bank sloughing, stream channel entrenchment, pocking in shallow-water breeding pools, head-cuts, fen impairment, vegetation loss and increased levels of fecal coliform in streams adjacent to meadows. Based on the annual reports CSERC has provided to the Forest Service (see the CSERC 2015 grazing report here: http://www.cserc.org/wp-content/uploads/2016/06/meadows-

2015-report-reduced.pdf), there is extensive evidence that demonstrates that key standards and guidelines that are supposed to regulate livestock and protect meadow vegetation and hydrology are not being met year after year.

Though CSERC has not directly monitored conditions of meadows and associated aquatic habitats in the Sierra, Sequoia or Inyo NF, their monitoring efforts on the Stanislaus Forest (where similar grazing management takes place) demonstrate that grazing activities in high elevation regions of the Sierra Nevada can severely impact meadow ecosystems and processes. The EIS for the Sierra, Sequoia, and Inyo NF states that the same level of livestock grazing would occur within any of the alternatives described in the EIS (e.g., B, C or D) as compared to the current plan, Alternative A, and that each of the three Forests "propose to manage grazing similar to the current practices"(see EIS p. 345, paragraph 1 under "Range Management"). This approach fails to even consider an alternative that would reduce grazing effects on plants, critical wildlife habitat, water quality, recreation, and other forest values. [8]

In the Inyo National Forest, Appendix F of the LMP provides tools and guides to determine meadow conditions, with outlined allowable use and utilization based on forage composition and hydrological conditions, as well as actions to take when conditions are found to be in a degraded state or downward trend. While Appendix F is a step in the right direction, the following comments regarding monitoring practices are as applicable to the Inyo as they are to the Sierra and Sequoia National Forest.

Given the extensive amount of watersheds within each national forest that are determined to be non-functional or functional-at-risk, meadows are also likely to be in a degraded or slowly recovering condition. There are no currently proposed Standards and Guidelines for each forest's LMP that will assuredly move meadows and riparian areas towards Desired Conditions that are outlined in the Riparian Conservation Areas section in Chapter 3 -Management Strategy, since there are minimal data provided by any of the Forests in their Assessments to demonstrate actual range conditions.

Under the proposed Alternative B, it is stated that up to five additional meadows in the Sierra and Inyo NF, and 5-10 additional meadows within the Sequoia NF are proposed to be either maintained, improved or restored per decade (DEIS, p. 51). While positive if such actions ever are implemented, on a forest-wide scale such restoration is inconsequential given the significant number of meadows. In addition to maintaining/improving/restoring a select few meadows, efforts should be directed toward a comprehensive monitoring protocol of Forest-wide meadow habitats within the Sierra, Sequoia and Inyo NFs that includes regularly measuring a majority, if not all of the indicators of meadow conditions mentioned above.

b. Recommended RCA Guidelines Could Significantly Strengthen Each Forest's Ability to Reduce Resource Impacts from Range Management

[8] We note that we requested in scoping that such an analysis be developed for the DEIS and provided specific recommendations in those comments.

In addition to the recommendations provided above in Section III, 0-51, the following monitoring requirements are recommended to be included in Chapter 3 – Management Strategy for the Riparian Conservation Areas:

- Baseline conditions of all meadows larger than 2 acres in size on each grazing allotment shall be determined within 5 years of the establishment of the new Land Management Plan. Results will be made available to the public and stakeholders within one year of the completion of the collecting baseline conditions.

- Meadows determined to be non-functional or functional at-risk will be prioritized for restoration, and monitored for 5 cycles every 3 years to monitor whether trend is in the positive or the negative.

- 25% of all allotments will have mandatory monitoring conducted by Forest staff every year in at least 25% of meadows larger than 2 acres in size within each of those allotments. Meadows that fit those parameters will be chosen at random for monitoring to discourage selective site management by permittees.

- The allotments that will have monitoring done as per the prior bullet will also be chosen at random at the end of the season to encourage compliance by all permittees. No grazing allotment can be monitored more than twice in a 3 year period.

- Mandatory monitoring components will be comprised of the range standards and guidelines in the adopted plans, including the monitoring of standards that require scaling back or removing grazing should negative trends be found to be occurring in (such as MA-RCL-GDL Standard 15 and 16 for the Sequoia NF).

- When grazing standards for allowable utilization or ground disturbance are found to be exceeded, or other violations are found in greater than 5% of the meadows monitored within an allotment, that permit shall require a 50% reduction in livestock the following season. If there are two years of violations in an allotment within a 5 year period, that permit will be suspended the following year, and on probation for the next 5 years. Any further violations found during the probation period will result in cancellation of that permittee's grazing permit.

- All monitoring data that is collected will be made available annually to the public and stakeholders for review.

- If monitoring is not done for two years in a row following the guidelines outlined above, then a mandatory reduction in permitted grazing activity should occur based on the percentage of area that Forest range staff is feasibly able to monitor in a given season.

- Meadows that have restoration work done to return hydrological function and meadow health will be monitored closely for a minimum of 5 years post-restoration project. Grazing will not be allowed back in restoration areas until meadow is deemed

to be functional. Other standards and guidelines apply once meadow and/or riparian conditions return to functional.

Using the above drafted requirements for range management on the three forests is essential for these reasons:

- The Sequoia, Sierra, and the Inyo National Forest have only provided minimal detail for monitoring results. Based on the monitoring results that CSERC has provided in the Stanislaus NF that contradict the monitoring work that the Forest claims it is doing, this raises the question as to whether any forest accurately shows whether seasonal grazing practices are meeting grazing regulations based on current standards and guidelines.

- Data provided by CSERC shows that simply having grazing standards without transparent monitoring and enforcement fails to meet Riparian Conservation Objectives on the Stanislaus Forest. There is a need for direction that require higher accountability and transparency in range monitoring work.

- There is a lack of acknowledgement by the Sequoia and Sierra that current grazing practices could be negatively affecting the health of meadow and riparian habitats, despite regional forest reports that provide information to the contrary.

- Using the "long-term" trend study that Region 5 has been conducting as one of the main data sources to justify continued range management at the status quo is flawed, as small plots in a few selected meadows in each Forest cannot truly assess ecological health and trend of an individual meadow, or make assumptions about other nearby meadows, or special aquatic features or riparian areas.

- UC Davis Rangelands has demonstrated a bias in their research that favors livestock use in their results. A more neutral institution to analyze range effects information should be selected in order to minimize controversy and doubt as to accuracy of conclusions.

- Failure of the Forests to address range management issues that affect watershed health is a direct conflict with Topic 2: Ecological Integrity in the DEIS.

2. Grazing In Post-Wildfire Landscapes Requires Additional Standards and Guidelines

Livestock grazing in post-wildlife landscapes, especially in the riparian areas of these landscapes, can lead to further stress on these recently disturbed ecosystems and impeded their post-wildfire recovery (Frissell et al. 2014, Kaczynski and Cooper 2015). Given the expectation that there will be increased occurrence of wildfire, either intended through management actions or the result of climate change, we expect that grazing is likely to be more prevalent in landscapes that have recently burned.

We are aware of damage to riparian areas in the Rim Fire that burned in 2013. Grazing has been allowed beginning in the firest year post-wildfire in the Rim Fire area. We find that even in areas

where there are abundant shrubs, introduced plants and grasses, livestock continue to wallow, overgraze riparian vegetation, pock, slough streambanks, and damage riparian areas. The photos below were taken on the Groveland Ranger District (Stanislaus National Forest) in August 2016. The photos show an area near Road 1N01 along Corral Creek.

Figure 2. Trampled and barren area in riparian zone along Corral Creek near Road 1N01, Stanislaus National Forest. Photo dated August 2016.

Figure 3. Livestock wallow within 10 feet of stream along Corral Creek near Road 1N01, Stanislaus National Forest. Photo dated August 2016.

The image below is of a spring. It is common for livestock to congregate around seeps, springs, and riparian areas in the post-wildfire landscape. These levels of ground disturbance and disturbance of riparian vegetation would not be tolerated by other uses permitted by the Forest Service and should not be tolerated for livestock grazing.

Figure 4. Damage around spring on private land within the Stanislaus National Forest. Photo dated August 2016.

The Inyo and Sequoia draft plans do not specifically mention grazing in post-wildfire landscapes, but they do not prevent it. The Sierra draft plan specifically encourages this practice in the following guideline:

> Forestwide (RANG-FW-GDL)
> 01 Transitory forage produced by wildfire and other resource activities may be used for grazing. (Sierra draft pan, p. 103)

The draft plans should all be revised to prevent grazing in riparian areas, including meadows and springs, after wildfire to protect the ecological integrity of these systems and to support their recovery. The DEIS must also provide a science-based direct, indirect, and cumulative effects analysis of the impacts to native plants and wildlife resulting specifically from competitive use of post-fire resources by livestock.

3. It is Legally Necessary to Protect Water Quality from Livestock Impacts

Due to the extremely high value that water provides for the forest ecosystem, for downstream consumptive uses, for recreation, and for the health of aquatic species in particular, protection of forest waters should be among the highest priorities for the land managers of national forests in the Sierra Nevada. Forest plan revisions should bolster any objectives, standards, or guidelines put forth in previous forest plans that have shown to be insufficient in maintaining functional watersheds. According to the DEIS, "…aquatic and riparian systems [are] the most altered and impaired habitats of the Sierra Nevada … The Sierra Nevada ecosystem produces approximately $2.2 billion in commodities and services annually and water accounts for more than 60 percent of that total value… " (p. 238).

Clearly the Forest Service has both a legal and moral responsibility as the caretaker of public lands to effectively protect water resources. Accordi**ngly, it should be a matter of great concern to the agency that less than 25% of HUC 12 watersheds on both the Sequoia and Sierra National Forests are functioning properly (table 69, DEIS). Yet the draft Forest Plans fail to effectively address the myriad factors that contribute to functionality of watersheds. One obvious threat to recreational use and human health is bacterial contamination of forest waters -- an impact that is** not adequately considered in the environmental analysis. Because of the widespread potential for pathogenic bacteria contamination due to livestock presence along forest streams as well as recreational use that may overlap in those areas, water quality should have specific forest plan direction for monitoring. There should also be Forest Plan direction describing appropriate responses to problems of contamination that may be identified by the monitoring.

a. Despite a Region 5 Goal to Restore Ecological Diversity, the Forest Plans Fail to Provide Adequate Protection for Water Quality and Aquatic Resources

The DEIS fails to provide legally adequate consideration of potential significant impacts to water quality from forest approved activities that have both direct and cumulative potential to violate

water quality thresholds for health and safety. Instead, the DEIS examines water quality solely in terms of sediment loading and water temperatures.

The importance of water quality goes beyond these two limited parameters. Page 590 clearly acknowledges the value of water "for recreational and ecological uses on the national forests because this water sustains the important water-based recreational setting and forest biodiversity that draws visitors." This value cannot be measured by simply examining sedimentation and water temperature. The presence of bacterial contamination that threatens the health of recreational users is a very real and documented concern that needs to be addressed at the forest plan level. The Bioregional Assessment for Sierra Nevada forests acknowledges "…the most significant forest land water quality problems being sediment, nutrients, temperature and hazardous chemicals…" (p. 26).

Based upon strong scientific evidence in peer-reviewed studies, the Forest Plans should include bacterial contaminants in their assessment of water quality. For decades, forest activities have been managed on national forest lands in the Sierra Nevada without clear, protective measures to avoid contamination of forest waters, while environmental organizations and recreational visitors raised concerns -- in particular, about livestock effects on riparian areas and water quality. In 2009, in response to the agency's unwillingness to undertake any consistent sampling of water quality, one environmental watchdog organization in the Sierra Nevada region (CSERC) began monitoring water quality associated with livestock grazing in national forest waters. Frustrated by agency indifference to repeated complaints and photo evidence submitted to Forest Service staff about water quality degradation from livestock in areas all across the Stanislaus Forest, CSERC biologist Lindsey Myers contacted the State Water Resources Control Board. Coordinating with the monitoring program staff at the Water Board, Myers spent weeks carefully establishing a protocol-consistent program of water quality sampling of forest streams on the Stanislaus Forest. USFS staff members including district rangers, range staff, and others were invited on numerous occasions to accompany Myers to observe the sampling and to accompany Myers with the samples to AquaLab, an independent water-testing laboratory. Consistent with the Quality Assurance Project Plan (QAPP) developed by Myers in cooperation with the State Water Board, sampling of streams was initiated prior to livestock entering those areas of the allotments. Samples were then taken again once livestock arrived, and in some areas after livestock had been removed.

On June 7, 2011, Myers and Kane published the results of their monitoring in the *Journal of Water Quality, Exposure, and Health* (Meyers and Kane 2011). As part of the study, surface waters were tested for pathogenic bacteria indicators (i.e., *E. coli*, total coliform bacteria, and fecal coliform bacteria). Results collected showed that average concentrations <u>*prior*</u> to the arrival of cattle at un-grazed sites tested far below State Water Board (SWB) Basin Plan threshold levels. However, at sites where livestock were present, elevated levels of fecal coliform were detected consistently – often at levels that not only violated Basin Plan thresholds, but at levels that reflected significant health risk from recreational contact with the contaminated stream water. In 2012, Myers and Whited published a second study following similar protocols to the 2011 study, but this one also examined the influence of climatic conditions between years Myers and Whited 2012). This study further confirmed that once livestock were present, within days SWB established Basin Plan standards (thresholds) were frequently exceeded, with water quality

violations in forest streams often spiking far beyond levels set to identify threats to human health from recreational contact of waters.

Myers and Kane (2011) documented over 40 violations in 2009, and Myers and Whited (2012) documented 161 violations over the three study years. In addition to violations documented in these published studies, CSERC's carefully documented water quality sampling of national forest streams in the central region of the Sierra Nevada has produced unpublished results that document many more violations. Ongoing sampling continues to detect violations of Basin Plan standards even in 2016.

These studies were completed following a Quality Assurance Project Plan that was developed in collaboration with the State Water Board. Myers was present for each sampling event to ensure specific protocols were followed, and samples were delivered within the 6-hour time limit to an ELAP certified testing laboratory. Sample sites were selected to represent a range of climatic conditions and allow samples to be delivered to the lab within 6 hours. Control sites were selected and sampled where cattle were excluded from grazing. In addition to comparing "livestock present" sample sites with control sites where cattle never graze, samples were taken "before, during and after" livestock presence in grazing areas to examine any fluctuations in fecal indicator bacteria that might be correlated to the arrival and departure of livestock each season. As part of the QAPP, Myers tested "field blanks" (samples of clean, filtered water) to ensure there were no quality control issues at the lab or with the sampling technique in the field. Both the Myers studies followed the same QAPP, and were published in peer-reviewed scientific journals that closely examine the methods and analyses involved in the studies.

The results of Myers' studies provide peer-reviewed scientific evidence that substantial bacterial contamination frequently occurs when livestock grazing is allowed on national forest grazing allotments and livestock are present near forest waters. The potential for pathogenic bacteria contamination of streams by livestock has been further corroborated by two recent studies.

First, Genzoli et al. (2015) conducted a 7-year study in the Scott River watershed in Northern California and found similar increases in fecal indicator bacteria (FIB) that also correlated with the arrival of livestock on the allotments. The Genzoli et al. study acknowledges the difference between their protocol-compliant study results and other results that were reliant upon less than 5 samples per 30 – day period.

Second, Knapp and Nelson (2015) completed a study commissioned by the 2015 Lahontan Regional Water Quality Control Board to monitor bacteria in surface waters associated with human development and livestock grazing. This study strongly supports the Myers et al. studies' results. In this study, in-depth statistical analyses and modeling were applied to data collected from over 700 samples to examine drivers of bacterial contaminants. The presence of livestock, day of the year, and time of sample collection were suggested as the primary drivers of elevated E. coli concentrations. The number of upstream campsites was not correlated with elevated bacteria levels, diminishing concerns about recreational sources. Instead, the Lahontan study draws clear associations between high levels of fecal indicator bacteria and livestock.

Based on the best science available science information referenced above, there is a clear and unavoidable legal responsibility for the Forest Service in each national forest's Forest Plan revision process to address the threat of water quality contamination by forest activities – especially the risk of pathogenic bacteria contamination by livestock brought into the national forest under grazing permits. Yet in the current DEIS and the three draft Forest Plans, there are no legally necessary objectives, standards, or guidelines directly focused on water quality and the associated issue of the health of recreational visitors or downstream users.

Further, rather than simply failing to provide clear objectives, standards, or guidelines to protect forest waters from approved forest activities, the draft Forest Plans fail to even provide for water quality monitoring that might detect water quality problems and alert Forest officials to the need for corrective action.

The failure of the FS to commit to undertaking meaningful water quality sampling means that the agency will have no science-based means to assess whether or not water quality violations are occurring. In response to the published studies about water quality and livestock by Myers, Roche, and others, authors of the 2014 "Science Synthesis to support socio-ecological resilience in the Sierra Nevada and southern Cascade range", GTR 247, express "…additional research on a number of sites in the synthesis area should help to put these studies within a broader context of national forest management…" (p. 352). This agreement that additional research is desirable further supports the need for the Forest Plans to include, at a minimum, specific monitoring requirements and standards and guidelines to adequately protect water (the most valuable resource on national forests in the Sierra Nevada) and to ensure the health and safety of forest visitors.

Long et al. (2014) provides a synthesis of current science related to management of Sierra Nevada forest resources. Within the report, the agency acknowledges the importance of scale when measuring livestock effects (p. 353). When examined on a watershed scale, measurable improvements are detected whereas looking at small, local riparian exclosures reflects fewer differences. This provides further impetus for the Forest Plans to include plan-level direction regarding a full suite of water quality impacts, particularly in relationship to the scientifically proven risk of bacterial contamination associated with livestock grazing.

Further support for the need for monitoring water quality in forest waters is reflected in the DEIS, which acknowledges the "…three national forests have limited direct measurements of water temperature and sediment from monitoring." Those are the two identified key parameters of water quality described on page 288.

The most current Soil and Water Conservation Handbook (R5 FSH 2509.22 CHAPTER 10) calls for each forest to monitor streams for "fecal indicator bacteria (FIB) in selected representative high-use recreation sites that are within or downstream of range allotments" (p. 256). The handbook goes on to detail the protocol for monitoring, including collection of samples "at intervals sufficient to determine compliance with Basin Plan objectives," a requirement that was not met by the monitoring included in the Roche et al. study that was sponsored by the Region. That requirement to sample at intervals sufficient to comply with Basin

Plan objectives has only been documented as being satisfied by the Inyo Forest. The results from the Inyo indicated that 86% of the samples violated state standards (p. 256).

The assessment for the Inyo National Forest cites water quality sampling done by the Inyo in collaboration with the Lahontan Regional Water Quality Control Board, which showed that only 14% of the samples taken where livestock graze met the standard for recreational contact, and all of the samples taken from areas where livestock were excluded tested clean (p. 58). The fact that water quality samples show extensive contamination of the sampled waters underscores the potential for the problem to be widespread in other areas where livestock are present along forest streams. The assessment's acknowledgment that there were violations of the standards set forth by the appropriate regulatory agency indicates a need for improvement in range management and provides strong justification for the development of appropriate standards and guidelines as well as mandated water quality monitoring.

When it comes to the three Forest Plans, the agency cannot simply ignore the issue of forest streams or lakes being put at risk of unsafe contamination by agency approved livestock use or by other contributing sources of pollutants. At the least the agency must acknowledge that the potential for contamination exists. Accordingly, the three Forest Plans should contain appropriate direction to ensure that mandated monitoring will be done to sample streams in order to assess compliance with Clean Water Act and Porter Cologne requirements. A clearly defined water quality monitoring program that is low-cost and that places a minimum burden on the agency is both appropriate and legally essential within the three Forest Plans to ensure water resources and human health are protected. The monitoring and adaptive management plan adopted in 2001 and 2004 for the national forest in the Sierra Nevada explicitly described how to identify both the need and action for "actively probing areas of uncertainty," calling for prioritization of cause and effect monitoring based on areas of uncertainty (USDA Forest Service 2001a, Appendix E – 17). Table E-9 describes the primary status and change questions associated with aquatic/riparian/meadow goals, with Goal 1 being Water Quality, questioning the status and change of nutrient levels in aquatic environments as well as other aspects of water quality (Id., p. E-26.) A clearly defined water quality monitoring program that is low-cost and that places a minimum burden on the agency is both appropriate and legally essential to ensure water resources and human health are protected.

Due to the extremely long process of completing NEPA to renew grazing allotment management plans, as is required by the Rescissions act, addressing this issue at the project level may mean degradation of water quality by livestock could continue without documentation and remediation year after year. As has been mentioned previously, the lack of standards and guidelines at the forest plan level means that there is no clear direction for analysis and consideration at the project level either.

b. Adequate Protection of Water Quality Requires Forest Plan Level Direction, with Specific Standards, Guidelines, Objectives and Outcomes as Well as Mandated Monitoring.

Adequate protection of water quality requires forest plan level direction, with specific standards, guidelines, objectives and outcomes as well as mandated monitoring that includes bacterial

contamination as a parameter in addition to sediment load and temperature. For analysis at the project level to be successful and sufficient, there needs to be Forest Plan level direction, standards, and guidelines.

The three draft Forest Plans do not propose any monitoring to detect ongoing bacterial contamination of forest waters from cattle, nor are there any standards and guidelines providing any clear direction for project level analysis. The plans also lack any direction as to what actual steps will be taken, if and when, water quality problems are detected by monitoring. In order to ensure compliance with the Clean Water Act and Porter Cologne requirements, as well as compliance with the Basin Plan, all three Forest Plans must address the issue of water quality contamination by forest activities, especially pathogenic bacteria pollution caused by livestock.

Specifically, the Forest Service needs to commit to undertake State Water Board protocol-consistent water quality sampling in areas of the Sierra, Sequoia, and Inyo National Forests where high levels of recreational use overlap with livestock grazing - creating the potential for contamination that poses significant health risks to forest visitors.

c. Recommendations to Assure Legally Required Protection of Water Quality in Areas Affected by Livestock.

The following objectives, standards, and guidelines are strongly recommended to be added into each of the three Forest Plans in order to increase ecological restoration, ensure protection of water quality, and improve conditions for wildlife species associated with aquatic habitats.

Objective – Protect the health of forest visitors by ensuring forest waters meet the standards for recreational contact with water in all streams throughout the forest.

Standard – Monitor water quality (in compliance with the appropriate regional water board protocol) on all grazing allotments annually by sampling water quality at a representative stream location where livestock may concentrate or persist for extended periods.

Guideline – Within 2 years of Forest Plan approval, the Forest shall select a representative area with a high level of dispersed recreational use that also overlaps with livestock use. Within 5 years of Forest Plan approval, at least one season of Water Board-consistent protocol sampling of water quality shall be implemented in the stream at that site by the Forest in order to assess whether the water consistently meets health and safety standards for recreational contact. Results of the sampling shall be made available to the interested public.

IV. Wildlife, Fish and Plants

A. Major Themes and Issues

1. Identification of Species Covered By the Draft Plans

The DEIS (p. 29) states that the draft plans were designed to provide for the ecological conditions to support the at-risk species identified during the plan revision process. The complete list of species of conservation concern is provided in the DEIS and in reports posted at the forest plan revision website. Federally listed species are only identified in the DEIS. The draft plans themselves do not identify the specific at-risk species they were designed to address. We believe that since the draft plans are intended to "contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern within the plan area" (39 CFR 219.9(b)(1) the at-risk species covered by the plan should be named in the plan. We ask that you include an appendix that lists, at a minimum, the at-risk species the plans were designed to address. This appendix can serve as a point of reference for future updates to the plan. Such an appendix is also the most efficient mechanism to let Forest Service staff and stakeholders know about key wildlife species covered by the plan.

2. Assumptions that Wildlife Protections Limit Ability to Implement Projects is Not Supported by Evidence

The DEIS assumes and repeatedly restates that wildlife protection measures, like those provided in Alternatives A and C, impede the implementation of restoration treatments (see for example DEIS, p. 21). These statements are not supported by evidence. Recent studies and time frames for project planning and implementation provide information to the contrary.

Dow et al. (2015) evaluated a project in the northern Sierra Nevada that was consistent with the protection measures reflected in the existing forest plans for the Sierra and Sequoia national forests. They found that the protection measures did not impede the ability to meet the objectives for the project, and restrictions in management direction on up to about 25 percent of the project area had little effect on the success of the project. We also reviewed the rate of treatment in the Herger-Feinstein Quincy Library Group Recovery Act. Over the course of 12 years (2000 to 2011), approximately 241,945 acres were treated on a project area of 1.53 million acres.[9] This corresponds to a rate of treatment per decade of about 200,000 acres or 20,000 acres annually. The HFQLG project area had standards and guidelines for wildlife protection (USDA Forest Service 2004) that were comparable to those evaluated in Alternative A in the DEIS. This actual rate of treatment is about twice that estimated for mechanical treatment and prescribed fire combined for the Inyo, Sequoia and Sierra national forests. This information indicates that standards and guidelines that limit the size of trees to be harvested, establish canopy retention requirements for treated stands, survey requirements and limited operating periods (all measures intended to protect wildlife) do not impede the implementation of logging projects.

[9] http://www.fs.fed.us/r5/hfqlg/publications/congress_report/2012/HFQLG-Independent%20Science%20Panel%20Report-Dec13.pdf

We also examined project planning and implementation data for the Dinkey Collaborative Forest Landscape Restoration Project (CFLRP). The CFLRP is a 150,000-acre project area on the High Sierra Ranger District (Sierra National Forest). Designated in 2010, the CFLRP has been designing and implementing projects annually. To date, 25,605 acres have been treated mechanically or with prescribed fire in accordance with the existing forest plan and utilizing the types of protections for wildlife that are now deemed too restrictive to the pace of treatments by the authors of the DEIS. This amounts to a decadal rate of about 42,675 acres within an area that covers less than 12 percent of the Sierra National Forest. The DEIS assigned a decadal rate of 50,000 acres to the entire Sierra National Forest for Alternative A, a value not much greater than the decadal rate for only 12 percent of the national forest. Clearly this value is an underestimate of the area that can be treated under this Alternative A. If the accomplishments for the Dinkey CFLRP were applied over the entire forest, decadal rates of treatment would approach those estimated for Alternative B.

Our experience with project planning and implementation suggests that significant delays often occur in the implementation of an approved project related to factors such as, limitations on staffing for sale preparation and contracting, and contract extensions requested by purchasers. These factors can significantly contribute to the length of time to implement a project and were not evaluated in the DEIS. For example, we are aware of projects approved in 2012 that still have units that are not treated. We are also aware of a project that was approved in 2012, but the contract preparation is not yet complete.

The research and data from the actual implementation of recent projects noted above indicates that the types of measures designed to protect wildlife in Alternatives A and C do not on their face restrict the effectiveness of treatments or their pace of implementation. Furthermore, the alleged impediment of wildlife conservation measures to increasing pace and scale is arbitrary and not supported by evidence. We ask that you revise the analysis in the DEIS to reflect the capacity to implement effective treatments noted in the studies and implementation information from actual projects noted above. We also ask that you address in any discussion the contribution of other factors in slowing the pace of implementation.

3. Tree Mortality Affects Baseline Conditions for Wildlife

The ongoing bark beetle and drought mortality event in the southern Sierra Nevada, triggered by climate change and the most extreme drought in 1,200 years, has already resulted in the death of tens of millions of trees in the plan areas. As is supported by a large body of scientific research (Six et al. 2014), past treatments in the plan areas, regardless of intensity or location, have been ineffective under outbreak conditions. The ultimate effects of this unprecedented tree mortality event on the abundance and distribution of the large tree- and dense forest-dependent species in the plan areas remains unknown. However, it is more than reasonable to assume that a region-wide mortality event of this magnitude will ultimately have significant effects on species that are dependent upon mature dense forest.

The Forest Service must consider how the bark beetle outbreak has and will affect the distribution and abundance of the large tree- and dense forest-dependent species over the short-

and long-term. This includes defining how much and where the remaining mature dense forest habitat is likely to be located within the plan areas. Based on that information, the Forest Service should also consider how the activities carried out under the proposed action would affect the distribution and quantity of habitat remaining and reassess the ability of the proposed action to maintain the viability of these species.

The Forest Service must also address the fact that after the outbreak subsides, tens of millions of trees in the plan areas will have been "thinned" through beetle mortality at the landscape-scale. The trees that survived the event, are by definition, resilient and/or adapted to a large landscape-scale drought and bark beetle mortality outbreak. This condition calls into question the idea that any area on this landscape will be in need of "restoration" treatments to increase resilience to drought and bark beetles, beyond returning ecologically beneficial fire to the ecosystem.

These are extremely important issues to address, considering the proposed action calls for as much as doubling the amount of timber harvested in the plan areas on the Sierra and Sequoia National Forests and increasing the amount of timber harvested on the Inyo National Forest by 50 percent, as well as logging trees greater than 30 inches in diameter. The amount of timber available in the plan areas will have been significantly decreased as a result of the mortality event and it is not clear where and how much timber or dense forest habitat will remain post-outbreak. Due to the landscape-wide decrease in the number and distribution of medium and large trees as a result of the mortality event, it is reasonable to assume that any conflicts between providing habitat for mature dense forest-reliant species and logging will only be exacerbated due to the reduced amounts expected for this habitat type. The Forest Service must address all of these issues in the environmental analysis.

4. Draft Plans and DEIS do not Identify the Necessary Ecological Conditions on which the At-risk Species Depend

New scientific research is routinely being published that identifies and/or quantifies the specific habitat needs of many of the at-risk species, including many studies conducted by and/or funded by the Forest Service. Despite this wealth of quantifiable species-specific science information, all of the planning materials to date have incompletely and inadequately defined the necessary ecological conditions upon which many of the at-risk species depend and the threats to species persistence in the plan areas. For example, in our February 22, 2016 comments on the December 2015 Example SCC Viability Analyses for the Great Gray Owl and Gilman's goldenbush we stated the following:

> At no point in time during the planning process have the specific ecological conditions on which the species of conservation concern depend or the specific stressors to the species been described. At every step of the planning process involving the SCCs we have asked that this be done. For many species we have provided what we believe to be the best available science information and recommendations on how it should be used to guide the forest plans. It is inappropriate that the viability examples and other SCC materials tend to generalize the threats to the SCC that are associated with competing management goals. For instance, the threat of reducing canopy cover to less than 80 percent in

> 50-acre great gray owl nest stands from logging is simply referred to as the threat of "forestry practices" in the example analysis and there is no mention of grazing being a threat to meadow foraging habitat. Until the specific ecological conditions on which the species depend and specific threats to those conditions are adequately described, the Forest Service will be unable to demonstrate that the plan components will ensure species viability by providing the specific ecological conditions on which the species depend and mitigating the specific threats to those conditions.

In the species-specific comment section of this comment letter, we provide extensive evidence that the DEIS incompletely and inadequately defines the ecological conditions on which many of the at-risk species depend and the specific stressors to those at-risk species and their habitats. For example, and despite repeatedly commenting on the issue, the DEIS does not specifically define average canopy cover in great gray owl nesting habitat or recognize logging as a threat to nesting habitat. Without quantifying the habitat needs and habitat suitability thresholds for each species when such science information is available, it cannot be claimed that the forest plans and DEIS are based on the best available science or that the plans maintain species viability.

In the species-specific comment section we also demonstrate that the coarse- and fine-filter plan components do not provide the necessary ecological conditions on which the species depend, in part, because the plan components are often not specific enough to determine if the specific conditions on which the species depend will actually be provided. For example, and despite repeatedly commenting on the issue, there are no plan components that maintain known minimum thresholds of high canopy cover habitat within spotted owl territories.

In the fall of 2014, we met with members of the regional planning team to present a viability analysis template and examples of viability analyses we developed for two of the SCCs. The template included sections titled: Ecological Conditions Necessary for Persistence and Viability, Spatial Scales of Importance, Habitat Connectivity Needs, Current Condition in Plan Area, Trend of the Condition, Significant Stressors Leading Trend, Emerging Threats to Consider, Evaluation of Ecosystem Plan Components to Maintain Viable Populations of the Species within the Plan Area, Potential Conflicts with Other Plan Components, and Species-specific Plan Components. The Forest Service used a similar viability analysis template and provided draft examples for great gray owl and Gilman's goldenbush for public comment and we provided extensive comments and suggestions. However, we were told by the planning team in the spring of 2016 that the template would not be used for the DEIS or other planning-related documents. We also provided the Forest Service with a set of matrices, as recommended in *Planning for Diversity* (http://www.defenders.org/sites/default/files/publications/planning-for-diversity.pdf), to create a crosswalk between ecological conditions, stressors and plan components.

The most troubling aspect of the failure to use the template or the matrices is that defining the information to be included in each section of the template and matrices is not optional. In fact, much of this information should have been developed and defined at the assessment phase of the planning process and used to develop the draft forest plans, an issue we commented on at the time. Our purpose for creating the template and matrices was not to create additional work for the planning team. Rather, our purpose was to create an organized and rapid way to outline the

best available science and provide a straightforward and transparent way to demonstrate that the forest plans provide the necessary ecological conditions on which the species depend and maintain viability. We ask that, as part of a revised DEIS, the Forest Service develop and include species-specific or habitat-specific (for groups of species with similar specific habitat requirements) viability analyses for the at-risk species.

5. Formal Endangered Species Act Consultation Required for Listed Species

On DEIS page 427 the following is stated:

> "For all threatened and endangered species, it is determined that the management approach under all alternatives at the programmatic level of the plan *may affect but is not likely to adversely affect* the Lahontan cutthroat trout, Paiute cutthroat trout, Little Kern golden trout, Owens tui chub, California red-legged frog, Yosemite toad, Sierra Nevada yellow-legged frog, and the northern distinct population segment of the mountain yellow-legged frog."

However, in direct conflict with the statement above, the DEIS states on page 307:

> Prior to issuing a decision, the Forest Service will formally consult with the U.S. Fish and Wildlife Service and request a biological opinion regarding the selected alternative and proposed forest plans. During the consultation process, the U.S. Fish and Wildlife Service may provide additional information that may lead to refined plan components to better conserve habitats and contribute to the recovery of listed species.

We believe the approach defined on page 307 is the appropriate approach to section 7 consolation. The determination on the adoption of the 2012 Planning Rule itself was found to be *likely to adversely affect* listed species due to the indirect effects of the planning rule. Similarly, forest plans are connected to the actions that will take place in the future pursuant to the plans and are reasonably certain to occur. Therefore, should any of the activities outlined in a forest plan be likely to result in the incidental take of a listed species, then the appropriate determination would be that the forest plan is *likely to adversely affect* the listed species in question.

In addition, it should also be pointed out that the comment on DEIS p. 427 refers to "all threatened and endangered species" and provides a list of threatened and endangered species. However, the list appears to be limited to the aquatic species and does not include a number of species that are federally designated as threatened or endangered, including, valley elderberry long-horned beetle, southwestern willow flycatcher, California condor, least Bell's vireo, etc. The Forest Service should consult with U.S. Fish and Wildlife Service on all species with historical ranges that overlapped the action area, or that occur in such a proximity to the action area that a project implemented under the forest plan may affect any threatened or endangered species.

6. Impacts on Species Dependent on Old Forest Conditions not Disclosed and Viability Not Maintained

The preferred alternative would reduce conservation measures that are in the current forest plans to protect species dependent on old forest structure. Given that many of these species are considered to be at-risk (e.g. California spotted owl, Pacific fisher, great gray owl, and marten), the adverse effects of each alternative must be rigorously evaluated using the best available scientific information. A DEIS must provide a reasoned basis for a decision. This has not been accomplished by the qualitative and subjective conclusions displayed in the DEIS.

Courts have established clear requirements for evaluating species viability. The Ninth Circuit established the basic analytical requirements in *The Lands Council v. McNair,* 537 F.3d 981 (9th Cir. 2008):

> … the Forest Service must support its conclusions that a project meets the requirements of the NFMA and relevant Forest Plan with studies that the agency, in its expertise, deems reliable. The Forest Service must explain the conclusions it has drawn from its chosen methodology, and the reasons it considers the underlying evidence to be reliable.
>
> … when the Forest Service decides, in its expertise, that habitat is a reliable proxy for species' viability in a particular case, the Forest Service nevertheless must both describe the quantity and quality of habitat that is necessary to sustain the viability of the species in question and explain its methodology for measuring this habitat.

The DEIS explains the effects analysis for wildlife as follows (p. 310):

> The key indicators for the analysis are trends in habitat quantity and habitat condition measured at a landscape scale. Primary habitat associations and associated threats are described for each at-risk species.[10]
>
> - **Habitat quantity** is measured by the potential trend[11] in amount and distribution of habitat types in the plan areas over the next 15 to 20 years.[12]
> - **Habitat condition** is measured by the potential trend in resiliency and ability of habitats to be adaptable to large-scale disturbances (such as wildfire, insect outbreaks, and drought).

In contrast, the DEIS claims that an evaluation of short term impacts of the alternatives is beyond the scope of the analysis:

[10] This is apparently done in Table 83. However, it is key ecosystem characteristics that must be identified, and habitat associations may or may not suffice for all species, and the scientific basis must be documented.
[11] While trends may be marginally adequate for NEPA effects analysis, NFMA requires a conclusion about whether the actual amount and distribution of habitat is sufficient for viability.
[12] Discussions in the DEIS seem to stress the long-term benefits over short-term risks without specifying the actual timeframes.

> Still, changes in forest structure to achieve resilience, particularly in the focus landscapes where there is a greater degree of flexibility to treat in wildlife habitat (see Table 82 and Table 83 above) can have short-term impacts on habitat condition. **The magnitude of these impacts would be the subject of project-specific analyses and are beyond the scope of this programmatic analysis.** (DEIS, p. 375, emphasis added)

The DEIS also dismisses the need for analyzing alternatives by stating, "It is unknown what proportion of areas burned in future fires would be high severity and result in large tree mortality" (p. 227). The future is always unknown, but NEPA requires that the Forest Service determine likely outcomes when they are important to inform the decision, and this difference between alternatives is the predominant factor in selecting Alternative B. The analysis of effects of alternatives on old forests consists of conclusory statements, such as that "Alternative B would result in increased restoration and resilience of old forest" (p. 232). Revealingly, Table 61 (p. 233) simply combines plan direction and consequences in a single entry for large trees (no consequences are shown).

The 2012 Planning Rule does not require that viability be maintained at the project level. The 2012 Planning Rule requires the Forest Service to (emphasis added): "maintain a viable population of each species of conservation concern <u>within the plan area</u>." (36 CFR 219.9(b)(1)) If it is not possible to determine the magnitude or extent of the effects of the forest plans on each of the at-risk species within the plan areas and such effects can only be determined at the project level, then one must conclude that the plans do not <u>maintain</u> the viability of the SCCs in the plan areas. Therefore the plans are not consistent with 2012 Rule and violate NFMA.

California spotted owl nesting and roosting locations are strongly associated with mature coniferous forests with tree canopy cover greater than 70 percent, multilayered canopies, and an abundance of large trees and snags. Territory occupancy is positively related to the amounts of this mature forest at core area scales, with higher colonization rates and lower extinction rates associated with territories having more mature forest (DEIS, p. 335). Thus the DEIS must disclose how the amount and distribution of these forest conditions change over the next 15 to 20 years, and explain its methodology and why it is considered to be reliable. The vague, subjective, speculative, relative comparisons in this DEIS do not do so.

The DEIS does not adequately analyze the effects of mechanically logging dense forests to reach the desired conditions for canopy cover and tree density on California spotted owl, fisher, marten, or great gray owl. In the face of a declining population trend, short term losses in fitness and reduced persistence are significantly riskier for any species and must be taken into account when judging the viability of a population. There is no quantitative or spatial evaluation of the effects of the draft plans on habitat quality or quantity. We know from our review of prior forest plan amendments (e.g., USDA Forest Service 2001a and 2004) and review of other revision efforts (USDA Forest Service 2016d that a quantitative evaluation of habitat is feasible.

Protected owl activity centers in the revised plan only require at least 60 percent tree canopy cover (SPEC-CSO-DC-02), and the plan appears to substitute competing concepts of "canopy diversity" and "heterogeneity" without any scientific basis for doing so. Mechanical treatments

are allowed in PACs in community buffers and focus landscapes. In spotted owl habitat outside of PACs, the desired condition for canopy cover may be much lower (Draft plan, Table 2 and Table 5). There is also a 30" tree diameter limit that does not apply to fire protection zones, and reduced protections in focus landscapes.[13] This is all evidence suggesting a need for a rigorous analysis of potential adverse effects on old forest species. However, the DEIS does not even disclose how much spotted owl habitat is within and outside of PACs, or how much is suitable for timber management, or the amount of owl or fisher habitat in the fire protection zones or focus landscapes.

We see that some spatial information has been provided in the DEIS (e.g., the proportion of spotted owl PACs in the plan area composed of greater than 50 percent dry mixed conifer forest (DEIS, p, 336); defining areas of dry and moist mixed conifer on a small (greater than 50,000 acres) sub-section of the plan area (DEIS, Figure 33, p. 180). This suggests the Forest Service has spatially defined the locations across the landscape that are to be dry mixed conifer and moist mixed conifer. However, we were unable to locate the methods used to spatially delineate dry and moist mixed conifer or a summary of this information in the DEIS or related materials. The Forest Service should provide the methods used to delineate dry and moist mixed conifer. The Forest Service should also complete a comprehensive spatial and quantitative effects analysis on the effects treatments would have on the SCCs associated with dry and moist mixed conifer and red fir forest types under each of the alternatives. Such an analysis should assume that all vegetation treatments in dense forest habitats will be mechanical, will convert the treatment area to the minimum allowable canopy cover limit for each vegetation type, and will remove significant numbers of large trees, all of which are allowed by the draft plans. Such an analysis would reveal the amount and location of remaining dense forest habitat in the plan area and demonstrate the potential impact of the proposed action on the dense forest species.

A closer examination of the partial analysis completed in the DEIS illustrates why the spatial analysis is essential to evaluating the potential effects of the draft plans on species dependent on dense forests. On page 180 of the DEIS, Figure 33 depicts changes in tree canopy cover from current to "modeled" desired conditions on an area greater than 50,000 acres in size. The upper left pane of the figure depicts areas that have been defined as dry, mesic, intermediate, and ridge. It is not clear which desired conditions would apply to "intermediate" or "ridge," because no plan components have been defined for "intermediate" or "ridge." Nevertheless, it is extremely troubling that the bottom right pane, which depicts the "Modeled Desired Conditions (Median by Patch)," shows that post-treatment only an extremely small (less than 300 acre) patch on the 50,000-acre landscape would have a median canopy cover greater than 70 percent. Such landscape conditions are not known to provide high quality habitat for spotted owls, fisher, marten, great gray owl, or goshawk. For instance, based on the best available science (i.e., Seamans and Gutiérrez 2007, USDA Forest Service 2015a), the conditions provided in the bottom right pane would not provide enough high quality spotted owl habitat to support a single spotted owl territory. The bottom right pane in Figure 33 provides evidence that the proposed action could result in forest conditions across that landscape that would not support species that

[13] The DEIS also does not provide scientific support for the assumption that removal of these large trees contributes in a measurable way to reducing fire risk in an old-growth stand. In fact the CBI report on treatments in fisher habitat imposes a 30" diameter limit and still achieves the desired fire benefits, and its authors recommend against removing larger trees.

rely on large blocks of dense forest habitat and the draft forest plans do not provide for the viability of these species.

The DEIS makes the argument that the future trend of these mature forest conditions is likely to be strongly influenced by the amount and intensity of wildfires. The DEIS includes projections of fire size and intensity by forest plan alternative in Table 19 (p. 68, in the "fire trends" section). These projections were based on analysis by UC Merced which modeled restoration treatments in different scenarios, and was cross-walked to plan alternatives in Table 18 (DEIS, p. 67). The heading for this table indicates that it also shows "expected changes in fire burned area," which would be expected as a basic output from such analysis. If this happens to be a robust analysis, the outputs could be used to estimate the amount of mature forest removed.[14] However, this label seems to be referring instead to the number of "large patches of very high intensity and severity." The table shows that Alternative B would lead to increases in large fire size by 12 to 17 percent while increases under Alternative C would be 23 percent. This table is the only place in the DEIS where the effects on vegetation are quantified by alternative, but the information reported is confused and not related specifically to the loss of mature forest, but rather only generally to changes in large fire size.

The amount of wildfire would also contribute to moving towards NRV, but this seems to have been ignored in the effects analysis. If these aspects of wildfire were considered, that should reduce the difference between the alternatives with regard to NRV (and could conceivably reverse their order). The DEIS is biased by including only the adverse effects of wildfire. The DEIS decries a "hands-off" approach as being "contrary to the best available science that recommends restoration efforts for many of the ecosystems that are outside their natural range of variation on the three national forests" (p. 42). It does not cite any specific science that says that active management is always better than passive management for ecological integrity.

In the "terrestrial ecosystems" section, the DEIS compares the composition and structure of vegetation types to desired conditions (which are the same for all alternatives). For the westside montane vegetation (where most spotted owl and fisher habitat is found), Alternative C has low correspondence to desired conditions for both composition and structure. Alternative B is the same except for "restoration areas in focus landscapes" (DEIS, Table 43, p. 168). This comparison simply repackages what the plan says, instead of analyzing the effects of doing what the plan says.[15]

Table 50 (DEIS, p. 207) displays "Indicators, criteria and thresholds used to analyze environmental consequences for the old forest special habitat." The criteria suggest that the "proportion of the landscape having large trees" will be determined for each alternative; however, such a quantitative display could not be found in the DEIS. The table also includes tree density (noting that low densities are more common). The table does not include canopy cover as

[14] Figure 3 (p. 63) shows a map of changes in predicted burned area, but not for each alternative. The model also predicted that "fire severity was more sensitive to changes in restoration scenarios than burned area alone. In other words, with restoration, fire severity declines more sharply than burned area" (DEIS, p. 66). Information about both would be needed to evaluate effects on old forest structure.

[15] Another table (Table 44, DEIS, p. 169) compares composition and structure within areas having different management classifications (fire protection zones and focus landscapes).This distinction does not seem to have been made in evaluating effects on wildlife based on whether their habitat exists in these areas or not.

a criterion for old forests. Similarity of current to desired conditions for old forest (and other characteristics) is provided in Table 54 (p. 211). There is no similar comparison of alternatives using these indicators.

In reference to the adverse effect on old forests of Alternative C, the DEIS states (p. 239): "It is uncertain when and where large, high-intensity fires might occur, but if they did there could be negative impacts if they burn large areas of old forest at high intensity and result in killing a lot of large trees." This conditional "if" represents to an assumption that such burns would occur, and is the apparent basis for derivative effects on associated wildlife species, which provides the rationale for not selecting Alternative C. This is then contradicted by Table 62 (DEIS, p. 250), which shows that old forest condition and extent are essentially the same in alternatives B and C. Unsupported conclusory statements do not provide the information required by NEPA for informed decision-making.[16]

Turning to the "wildlife, fish and plants" section, there is no additional quantitative analysis (nor any tables that compare alternatives, even qualitatively). The DEIS admits that, "A high level of uncertainty remains regarding patch sizes of high-severity fire that affect California spotted owl survival and reproduction," (DEIS, p. 337), and, "It is clear that additional information is needed to better understand the effects of fire on California spotted owls" (DEIS, p. 338), and, "There continues to be a great deal of uncertainty about the nature of effects of fuel reduction treatments, particularly mechanical thinning, on California spotted owls" (DEIS, p. 338). Yet the selection of Alternative B would lead to treatments with unknown risks to these at-risk species in parts of the forests where they would provide unproven benefits to the species. Since this information is essential to making this decision, and is incomplete or unavailable, compliance with 40 C.F.R. §1502.22 is necessary.

The effects of alternatives on wildlife are discussed only in narrative terms for each vegetation type. In the foothills type, for Alternative B, there is a "greater risk of treatment-related effects to habitat quantity and condition under this alternative compared to alternative A because of the greater flexibility to remove larger diameter trees within the two wildfire protection zones and to treat within California spotted owl protected activity centers and suitable fisher target cells within community buffers and focus landscapes" (DEIS, p. 364). On the other hand, "Old forests would likely benefit if treatments reduce the loss of other large and old trees in the future." To even speculate about such benefits, there needs to be some supporting analysis that is more than inconclusive. The use of "if" acknowledges that this major premise of the preferred alternative is merely an unproven assumption.

Finally, the DEIS concludes that plan components in Alternative B would maintain "key habitat elements in most of these habitats in the short term," and, "[t]herefore, these plan components, at the programmatic level of these plans, are anticipated to provide long-term habitat in sufficient quantity and condition for terrestrial wildlife species" (DEIS, p. 364). This is despite the assertion that short-term effects have not been analyzed. For Alternative C, the one paragraph "effects analysis" reaches this conclusory statement: "This restriction on treatment intensity and

[16] This is especially true in the Sierra Nevada where previous planning efforts have conducted much more rigorous effects analyses (USDA Forest Service 2001).

treatment methods would make habitat for at-risk terrestrial wildlife species more vulnerable than under alternative B" (DEIS, p. 365).

Since Alternative C is consistent with recognized conservation strategies for California spotted owls and fishers, there is a particular burden on the Forest Service to provide evidence of its claim that fewer protective measures for old forest species provides greater benefits to those species. As demonstrated above, there is no science or analysis to support this comparison.

The rationale behind Alternative B is that, "These plan components were crafted with the idea that treatment to improve habitat condition is needed and warranted for these species but such treatments in these sensitive habitats should retain large areas of preferred habitat elements that support these species" (DEIS, p. 375). Thus the Forest Service needs to demonstrate that Alternative B would provide such areas in the amount and distribution necessary to maintain a viable populations of old forest species in each plan area). There is nothing in this DEIS that does so.

The DEIS acknowledges that, "The tradeoff under any management approach is finding an appropriate balance between short-term risks from restoration treatments and long-term gains from improvement in habitat condition" (DEIS, p. 375). It finds that "restoration efforts focused on old forest conditions that move forest vegetation toward the natural range of variation and reduce the risk of large-scale habitat loss would have a long-term benefit to species associated with mature forest conditions like the spotted owls and fishers that would outweigh short-term effects (less than 5 years after implementation)" (DEIS, p. 378). Again, this statement is made without any analysis of short-term effects, or any meaningful comparison of the long-term benefits.

The ultimate conclusion in the DEIS regarding effects on wildlife is this: "Therefore, these plan components, at the programmatic level of these plans, are anticipated to provide long-term habitat in sufficient quantity and condition for terrestrial wildlife species" (DEIS, p. 364). This DEIS is fatally flawed, and compliance with NFMA requirements for diversity have not been demonstrated, because there is no determination of the quantity of habitat that would be needed or provided, and there is no determination of the short-term effects, particularly for accelerated restoration.

B. Regional Forester Sensitive Species Program and Species of Conservation Concern

The 2012 Planning Rule sets forth a new policy for species that are at-risk of being listed as threatened or endangered. Like its 1982 predecessor, the language in the new rule is derived from the requirement in the National Forest Management Act to provide for diversity of plant and animal communities. Under the 2012 Planning Rule, forest plans must provide ecological conditions necessary for viable populations of species identified as species of conservation concern (SCC). In the Preamble to the planning rule, the Forest Service has stated that SCC are similar to existing regional forester sensitive species (RFSS) because population viability is a concern in each case (p. 21216).

The Forest Service has recently determined that, "it is unnecessary to apply the processes for sensitive species to administrative units once they have completed a plan revision under the 2012 planning rule" because it would be "redundant." Once a revised plan is in effect, the RFSS list would no longer apply to that unit. (2670/1920 memo to regional foresters," Clarification of Implementation of the 2012 Planning Rule, Directives, and Regional Forester Sensitive Species," June 6, 2016.)

While the basis for selecting SCC may be similar to RFSS, the operations of the two approaches to managing at-risk species are substantially different. Sensitive species have been protected at two points in the decision-making process – both at the forest plan and project level. In addition to forest plans providing habitat for viable populations of RFSS (and other species), project analysis was required to verify the habitat conditions and effects on RFSS in a biological evaluation (BE) for each project. BEs have resulted in project modifications necessary to provide for species viability. In contrast, the planning rule relies on the forest plan's plan components to provide for viability, and relies on an as yet undefined process to determine project level consistency. The planning rule also does not require monitoring of SCC, further weakening the connection between plan direction and implementation.

We are concerned about this new approach for two reasons. First we are seeing RFSS not being identified as SCC, and with very little explanation. When an agency changes its policy it must make an extra effort to explain the changes in factual circumstances that require that change in policy. While the Forest Service created an expectation that SCC lists would be similar to RFSS lists ("At-Risk Species Policy Clarification Communication Plan," June 3, 2016, p. 6), here there are species for which the regional forester had recently found viability concerns, and about which the same regional forester is now saying the opposite. We expect a complete explanation and comparison of the criteria that were used to determine viability concerns then and now for former RFSS that have not been designated as SCC. (See discussions below of individual species.)

Second, we do not believe that this new single-level system, as expressed in this forest plan revision process, will provide adequate protection for SCC and other at-risk species. The Forest Service asserts that the 2012 Planning Rule approach is "more comprehensive;" its intent is "a stronger approach to prevent species from becoming threatened or endangered" (Communication Plan, p. 1). Perhaps that was the intent, but the proof is not in these forest plans. The revised plans rely heavily on desired conditions and mostly subjective and generalized standards and guidelines that were purposely designed to provide management discretion. At the same time, the Forest Service, through its changes in RFSS policy, has removed the obligation to consider the effects of individual projects on species viability. This is a recipe for disaster that quite possibly will increase the number of species listed as threatened or endangered due to the revised plans' reductions in regulatory mechanisms, and attendant habitat degradation and population decline.

In part, the purpose of a forest plan is to provide programmatic guidance to project-level management. Because ecosystems are extremely complex, programmatic effects analyses are inherently incomplete due to unforeseen site- and project-specific effects that defy programmatic assumptions. In addition, the science used for the forest plan will become outdated. Even when

project designs are consistent with forest plans, there may be cases when project-level effects are likely to compromise viability.

The Forest Service appears to believe that NEPA analysis undertaken for projects will adequately replace the biological evaluation process that was used for RFSS. It states that project analysis will "tier to the unit plan and focus on a 'plan consistency' analysis" (Communication Plan, p. 2). Tiering to the broad-scale NEPA analysis for the forest plan (not to the plan itself; tiering is a NEPA concept) would require that a reasonably rigorous and objective analysis be provided in the forest plan EIS. However, as we have pointed out elsewhere, this has not occurred in this DEIS.

Moreover, relying on forest plan consistency analysis requires that there be meaningful plan components to be consistent with. In particular, desired conditions that clearly describe the quantity and distribution of habitat elements needed by at-risk species and standards and guidelines that ensure such conditions are provided must be included in forest plans. The lack of standards and guidelines that would prevent backsliding also allows desired conditions to be traded off against short-term adverse effects while allowing a project to remain consistent with the forest plan. Finally, it is not clear that the requirement to use best available scientific information to inform the "planning process required by this part" (36 CFR 219.3) applies to project determinations of consistency with the forest plan. None of this suggests that SCC will be protected to a greater degree than RFSS on these national forests.

Monitoring becomes a much more important component of a conservation strategy under the proposed approach. Prior to each project it would be important to validate that conditions and science have not changed and projected effects relevant to at-risk species are occurring as expected.[17] Validating the assumptions about the adequacy of coarse- and fine-filter plan components for meeting the needs of the species is especially important. In the absence of project analysis requirements, monitoring strategies must explicitly link implementation of projects to completion of monitoring and the results of monitoring. There is nothing like that in the proposed monitoring program.

The approach taken to revising these forest plans does not provide for an orderly transition from RFSS to SCC. These revised forest plans must include plan components that provide more certain protection for at-risk species. In addition, the Forest Service needs to establish new national procedures for evaluating the effects of projects on the SCC, much like the guidance that exists now for federally listed species and other RFSS. Until such a requirement is in place we cannot be assured that the collective implementation of the plan's components will provide the ecological conditions needed to maintain viable populations.

An orderly transition also requires that BEs prepared for the forest plan be extremely clear on how the revised plan provides protection that is more comprehensive for each SCC. The Forest Service must document both its rationale for concluding that a revised plan meets the viability requirement of the 2012 Planning Rule for SCC, and its rationale for viability determinations for RFSS. Where species have both classifications, a single document could provide all of the necessary information, and it must meet the requirements for a BE (see June 3 2670/1920

[17] This is precisely the type of information that is presented in a biological evaluation (BE).

memo). For RFSS where there is no longer a concern for persistence in the plan area, a BE should also serve the purpose of validating that conclusion, in addition to evaluating the effects of plan components on viability. Since this is the last time that viability for these species would be evaluated, we attach great importance to the integrity of the scientific analysis included in these documents.

Unfortunately, the BE for the RFSS affected by these three draft forest plans is insufficient and not based on the best available science information. Below we provide several examples illustrating the inadequacy of the BE.

The analysis presented in the BE for each species fails to evaluate the effects of Alterative A on any species and instead refers the reader to the EIS for the forest plan amendments in 2004 for an analysis of the effects of the existing plans on RFSS. This approach is inadequate since it leaves unexamined any changes in species status or the effects of the implementing the plans since 2004. This comparative analysis is especially important for those species for which the proposed plans (Alternative B) do not adopt standards or guidelines for a given species that are as protective as those in existing plans. A case in point is northern goshawk, a species designated an RFSS and now not designated an SCC. Existing forest plans include several standards and guidelines and a management area to maintain viable populations of this species (USDA Forest Service 2001 and 2004). The BE for the three draft forest plans identifies past and ongoing timber harvest as a threat finding that:

> These recent management policies have likely degraded goshawk habitat quality by fragmenting forests, reducing the amount and distribution of mature and old-growth forest stands and large trees, increasing understory tree density, and changing tree species composition, resulting in broad-scale reduction of the proportion of pine in forest stands. Nest sites and territories have been lost from logging in nest stands and from stand replacement fires. (wildlife BE, p. 217)
>
> Some of the threats facing northern goshawk include habitat loss and fragmentation (e.g., loss of large diameter trees), forest structure changes and changes in prey populations due to fire suppression and climate change, risk of habitat loss due to stand-replacing fires, and disturbance from human activity in and near territories. A study conducted by Morrison et al. (2011) in the Lake Tahoe Basin indicated that northern goshawks are susceptible to human disturbance; human activity was twice as high within infrequently occupied territories as compared to frequently occupied territories. Many kinds of human activities have been documented to affect raptors by altering habitats; physically harming or killing eggs, young, or adults; and by disrupting normal behavior (Postovit and Postovit 1987, Delany et al. 1999 as cited in Morrison et al. 2011). A recent study on nesting northern goshawk response to logging truck noise found that while goshawks alerted (turned their head in the direction of the noise) to the noise they did not flush and response was inversely proportional to the distance of the nest from the road (Grubb et al. 2012). (wildlife BE, p. 218)

The BE however, says nothing about the difference between Alterative A, that includes plan components to address disturbance and habitat modification identified as a threat, compared to

Alternative B that provides none of these assurances. The effects analysis all alternatives is extremely brief and we provide it here in its entirety to illustrate our point:

> **Direct Effects**
> There are no direct effects as a Forest Plan does not constitute an authorization but creates a management framework on how to proceed. Chapter 3 in the draft EIS contain specific analysis direction for all wildlife species.
>
> **Indirect Effects**
> Alternative A: Implements the 2004 Sierra Nevada Framework and will refer to the analysis in the BE for that plan.
>
> Alternative B, C, and D: Late seral stage habitat is within each alternative and the combination of large trees as well as snags is provided for in each alternative. Climate change concerns are being considered and allowing for late seral habitat corridors and landscape linkages. Risks due to uncharacteristic wildfires is ameliorated by the restoration that is proposed.
>
> **Cumulative Effects**
> The Forest Plan is a management framework on how to proceed. It does not authorize a project. Any specific project or action will have appropriate level NEPA completed including project minimization measures to provide protection to wildlife and fish species. All past actions in the plan area have contributed to the existing baseline and are described in the draft EIS. Therefore only future actions would be considered. Future actions will be addressed in the specific project level NEPA.
>
> **Determination Statement**
> Inyo, Sequoia and Sierra NFs: Implementation of the Forest Plan may affect northern goshawk but will not lead towards Federal listing or a loss of viability. Impacts to northern goshawk are beneficial impacts such as reducing the risk of catastrophic wildfires by restoring conifer areas while still maintaining large trees and snags. (BE, p. 217

The forest plan amendments in 2001 and 2004 concluded that protective measures were necessary to maintain viable populations of this species. This same issue emerges for other RFSS that have species specific plan components in existing plans that are dropped in the draft plans. Today the BE and DEIS conclude these plan components are no longer necessary to maintain viable populations, but provide no analysis to support this change.

The BE also fails to address the effects of the alternatives on the identified threats to the species. This is noted for goshawk above, but it is also the case for other species. The threats to the species, especially those under the control of the Forest Service, such as logging, grazing and other permitted activities, must be evaluated in the BE.

The use of best available science information is inconsistent at best in the wildlife BE. Some species accounts utilize current information, but others omit information from the last few years.

For example, information presented in the BE for California spotted owl does not address recent research on population trends and habitat requirements, and key information since 2013 is simply missing. For example, the BE (wildlife BE, p. 27 refers to "Using data for an 18-year study period, Conner et al. (in press) found that the different estimators…" where Conner et al. is a study that was published in 2013.

Lastly, the draft BE does not seriously address the threats and risks to the affected species and adopts a "copy and paste" approach to its effects analysis. For most of the wildlife species addressed, any effects from the proposed action and alternatives are only addressed as indirect effects with direct and cumulative effects being summarily dismissed. For instance, for each wildlife species, this is the statement repeated for each regarding cumulative effects:

> **Cumulative Effects**
> The Forest Plan is a management framework on how to proceed. It does not authorize a project. Any specific project or action will have appropriate level NEPA completed including project minimization measures to provide protection to wildlife and fish species. All past actions in the plan area have contributed to the existing baseline and are described in the draft EIS. Therefore only future actions would be considered. Future actions will be addressed in the specific project level NEPA. (wildlife BE regarding spotted owl, p. 35)

The examination of cumulative effects is essential to the evaluation of risks and benefits in the long and short term and critical to support a finding that viability will be maintained in the plan area for SCC and throughout the species range (RFSS), yet the wildlife BE inappropriately punts this analysis to project level NEPA.

For the reasons noted above, we find that the draft planning documents, draft BE, and DEIS, do not provide an appropriate level of analysis to support the findings required by FSM 2670 and the Planning Rule (36 C.F.R. 291), and as such are not consistent with NFMA.

C. At-risk Species Inappropriately Excluded from SCC List

1. High Priority Species Designated by State Wildlife Agency Ignored

The California Department of Fish and Wildlife (CDFW) maintains a list of Species of Conservation Concern to guide land management planning on lands over which they have jurisdiction. "A Species of Special Concern (SSC) is a species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

- is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role;
- is listed as Federally-, but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed;

- is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status;
- has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status. (California Department of Fish and Wildlife 2016)[18]

From this list, those listed under the California Endangered Species Act, and those designated as candidates for listing under either the State or Federal Endangered Species Acts, the CDFW developed a list of Species of Greatest Conservation Need (SGCN) to establish a priority for need as required in the development of California's State Wildlife Action Plan (SWAP). The SGCN list includes "those species that are deemed [the] most rare, imperiled and in need of conservation actions."[19]

In recognition of the threats and conservation needs identified in the SWAP, all species identified as SGCN should be included on the Species of Conservation Concern list. At least five species are designated SGCN in the Sierra Nevada bioregion, but have not been included on the Species of Conservation Concern list. These are: summer tanager, Mount Pinos sooty grouse, olive-sided flycatcher, yellow warbler, and northern goshawk. We ask that you review the Species of Greatest Conservation Need list and supporting materials, and add these five species along with any SGCN occurring within the plan areas to the Species of Conservation Concern list.

2. Northern Goshawk

Northern goshawk has been designated a Regional Forester's Sensitive Species (RFSS) since the program was initiated in the late 1980s and forest plans in the Sierra Nevada have include land allocations and standards and guidelines for this species since the first forest plans were adopted.

The Forest Service did not identify the need to change protections for northern goshawk in the Notice of Intent to prepare an EIS of the revised forest plans:

> Existing management areas and direction for California spotted owl and northern goshawk protected activity centers and spotted owl home range core areas would be retained with clarifications and alignment of plan components. No substantive changes would be made with the following exceptions:
>
> - Updating and clarifying the desired conditions and other plan components for these areas based on information from the California spotted owl new interim guidelines and conservation assessment, when they are available.
> - Changing some standards and guidelines within the Community Wildfire Protection Zone and the General Wildfire Protection Zone to better balance the need to provide key habitat with managing the threat of wildfire impacts to communities and other

[18] http://www.dfg.ca.gov/wildlife/nongame/ssc/
[19] http://www.dfg.ca.gov/SWAP/SGCN/

values at risk. This would include minor changes to SNFPA 73 and converting and clarifying direction related to limited operating periods in SNFPA 75, 76 and 77 to guidelines.

- Adding plan content and updating and clarifying standards and guidelines to include opportunities for adaptive management related to the amount of protected activity centers that can be treated mechanically (SNFPA 80 and 81) and with prescribed burning (SNFPA 78 and 79).

(79 FR 168 (August 29, 2014), p. 51554)

None of the exceptions noted in the NOI referred to eliminating protection measures for northern goshawk. Despite the Agency's intent in 2014 to include this as an at-risk species and retained protection measures, this species has not been included on the Species of Conservation Concern despite the substantial science information indicating concern about its persistence in the plan areas. Furthermore, the draft plans eliminate protection measures currently im place for this species.

a. Overview of Goshawk Status and Habitat Associations in the Sierra Nevada

Goshawks occur primarily in ponderosa pine/mixed conifer vegetation types on the west side of the Sierra Nevada. On the east side, they inhabit Jeffery Pine or ponderosa pine, and occasionally hardwoods such as aspen (Keane 2008). The most consistent vegetative characteristic of goshawk nest sites is dense canopy closure (Zeiner et al. 1990; Squires and Reynolds 1997; Desimone and DeStefano 2005). Nest stands are typically characterized by high canopy cover on gentle to moderate slopes with an open understory (USFS 2001). When compared to random plots, stands preferred by goshawks for nesting and roosting (in west side vegetation types), are characterized by (Squires and Reynolds 1997; Hargis et al. 1994; Keane et al. 1999; Maurer 2000; USDA Forest Service 2001a):

- Greater basal area than random plots
- Greater numbers of large live trees (trees > 24" dbh)
- Greater canopy cover (mean = 65% and 70% Keane et al. 2006; Mauer 2000)
- Higher than average numbers of very large, old, trees (mean = 17 trees/ac > 40" dbh)
- Open understory with significantly lower numbers of trees less than 12" in dbh

Possible explanations for goshawk affinity to closed canopy conditions include protection from predators, reduced exposure to cold or hot temperatures, increased food availability, reduced competition for nest location by other large birds (ravens, red-tailed hawks) (Andersen et al. 2005). Goshawks have high territory fidelity (Weins et al. 2006). Nest locations may alternate each year within one territory. A breeding pair may maintain up to eight alternate nests (Squires and Reynolds 1997).

Goshawk reproductive success is closely associated with tree squirrel populations (Keane et al. 2006; Wiens et al. 2006; Salafsky et al. 2007) and annual weather patterns, particularly late winter temperatures (Keane et al. 2006). Considering that tree squirrel densities follow the previous year's pinecone crop, the importance of old forests is underscored because older conifers tend to produce more abundant and frequent cone crops (Keane et al. 2006).

b. Threats

Goshawks are threatened by logging, fire suppression and other land management activities, as described below. The rationale provided not to identify goshawk as an SCC states that threats are from past activity or outside the planning area. However both of these statements are not supported by best available science as described below.

Keane (2008) summarizes threats to northern goshawk emphasizing habitat loss and degradation as the primary known threats (Squires and Kennedy 2006). Citing timber harvest and fire suppression policies as major stressors, Keane (2008) finds that:

> "…recent management policies have likely degraded goshawk habitat quality by fragmenting forests, reducing the amount and distribution of mature and old-growth forest stands and large trees, increasing understory tree density, and changing tree species composition, resulting in broad-scale reduction of the proportion of pine in forest stands. Nest sites and territories have been lost from logging in nest stands and from stand-replacement fires. There is also increased risk of loss of habitat to such fires because past management policies have increased fuel loads."

Timber harvest is described as the principal threat to breeding populations in Squires and Reynolds (1997). In addition to the relatively long-term impacts of removing nest trees and degrading habitat by reducing stand density and canopy cover, logging activities conducted near nests during the incubation and nestling periods can have an immediate impact resulting in nest failure due to abandonment (Boal and Mannan 1994, Squires and Reynolds 1997). Similarly, NatureServe (2015) found timber harvest to be a threat and concluded that:

> ...probably declining in some areas primarily as a result of habitat alteration (especially logging), which can be expected to continue; effectiveness of forest management guidelines in providing adequate protection remains to be determined.

The vulnerability and threats support a finding of substantial concern for persistence in the plan area.

Past reviews completed by the Forest Service also highlight the substantial risk factors for northern goshawk from actions under the control of the Forest Service:

> The major threat to northern goshawks at the present time concerns the effects of vegetation management (e.g., timber harvest, fuels treatments, etc.) and wildfire on the amount, distribution, and quality of habitat." (Keane and Morrison 1994, Kennedy 1997, Squires and Reynolds 1997).
>
> Assessing historic to current changes in the amount and quality of northern goshawk habitat in the Sierra Nevada is problematic due to uncertainty regarding: (1) historic vegetation conditions; (2) what constitutes high quality goshawk habitat; and (3) current vegetation conditions due to accuracy, resolution, and scale concerns related to current inventory maps. However, it is possible to qualitatively address these issue

> based on current general knowledge of northern goshawk habitat relationships and overall changes that have occurred in Sierra Nevada forests in response to predominantly selective timber harvesting and fire suppression policies. Analyses conducted at both the plot and landscape scales have documented large reductions in mature and older forests throughout the Sierra Nevada and reductions in the numbers and distribution of large trees as a result of selective harvesting of large pines, and increases in the numbers of smaller diameter trees and density of forest understories as a result of fire suppression (Laudenslayer 1990, McKelvey and Johnstone 1992, Franklin and Fites-Kaufmann 1996). These trends suggest that there has been a reduction in the amount and distribution of the mature and older forests with large trees and open understories used for nesting by northern goshawks. Greater uncertainty exists regarding changes in foraging habitat, although limited knowledge of northern goshawk foraging habitat use would suggest that these habitat trends would also have led to a reduction in the distribution and amount of foraging habitat. Thus, although uncertainty exists, documented changes in the structure and composition of Sierra Nevada forests are predicted to have led to a reduction in the types of habitats used for nesting and foraging based on current understanding of northern goshawk habitat relationships. It is not possible to determine if changes in the distribution and amount of habitat have resulted in northern goshawk population changes due to lack of data on historic and current population sizes and distributions. (USDA Forest Service 2001a).

These threats drove the inclusion of land allocations, desired conditions and standards to ensure that viable populations of northern goshawk were maintained in the plan areas.

Conservation measures on private lands are limited to the protection of a small area around the nest stand. Woodbridge and Detrich (1994) reported that short-term reoccupancy rates approached 100% for core areas that had approximately 80 ha of suitable nesting habitat. These results indicate that the management approach on private lands is likely to contribute to greater variability in nesting success and occupancy.

The threat of habitat modification to northern goshawk and a variety of species associated with old forests was a principle reason driving the forest plan amendments in 2001 and 2004 on eleven national forests in the Sierra Nevada. Protection of nesting habitat through the establishment of a protected activity center (200 acres around a nest stand) was adopted in response to the work by Woodbridge and Detrich (1994) on reoccupancy. This measure and other measures to limit logging were adopted with the objective of reducing the threats to this species and providing for its persistence.

Siegel et al. (2014) evaluated 168 bird species that breed in the Sierra Nevada using NatureServe's Climate Change Vulnerability Index (CCVI) to predict vulnerability to climate change. Species range maps, information about species' natural history traits and ecological relationships, historic and current climate data, and spatially explicit climate change projections were weighed. Northern goshawk was among the 17 species ranked as vulnerable, meaning goshawk abundance or range within the Sierra Nevada is likely to decrease by 2050 as a result of climate change (Siegel et al. 2014, p. 7). Factors found to be contributing to goshawk

vulnerability to climate change include restricted diet, association with aquatic habitat, and distribution relative to natural and anthropogenic barriers such as wind farms (Siegel et al. 2014, Appendix 2). Furthermore, goshawk populations are still recovering from lingering population impacts of the pesticide DDT (Siegel et al. 2014, Appendix 2). Of note, seven of the seventeen species ranked as vulnerable were associated with mixed conifer forests; this signals concern about estimated changes in this habitat type. The authors recommend using these results to develop strategies to ensure persistence of vulnerable species and guide land management.

Goshawks are vulnerable to land management due to their sparse distribution across the Sierra Nevada. Home ranges for northern goshawks are fairly large and relatively low population numbers would be expected even in areas where threats are non-existent (Keane 2008). Territorial behavior, available prey, and suitability of nesting habitat are all factors that together are likely to regulate population numbers and distribution with habitat quality driving distribution (Keane 2008). This means that landscape can only support a limited number of territories and the spatial distribution of habitat is critical to maintaining northern goshawk populations. Modest reductions in territory occupancy can result in substantial changes to this species distribution, especially on the Inyo, Sierra and Sequoia national forests, which are located at the southernmost extent of this species range in the Sierra Nevada.

Keane (2008) also highlighted several areas in California where range restriction was a concern for northern goshawk. The westside ponderosa pine zone and southern Sierra Nevada were among these areas. Extensive logging of pine forest on the westside of the Sierra Nevada was cited as a principle factor contributing to range restriction. "Goshawks are known to nest down to about 2500 ft (750 m) on the west slope, so it is likely that reductions in mature and old-growth pine have resulted in reductions in goshawk numbers in these forests" (Keane 2008, p. 158). The southern Sierra Nevada was highlighted for its low nest records on the public lands south of Yosemite National Park. They concluded "It is uncertain whether this represents the limited survey effort expended in these areas, low breeding densities/suboptimal habitat conditions near the southern edge of goshawk distribution in the southern Sierra Nevada, or potential reductions in densities or distribution at the edge of the species' range." (*Id*.).

As reported by the Forest Service in 2006, densities of known breeding territories were considerably lower in the southern Sierra Nevada compared to elsewhere in the bioregion (USDA Forest Service 2006; see map below).

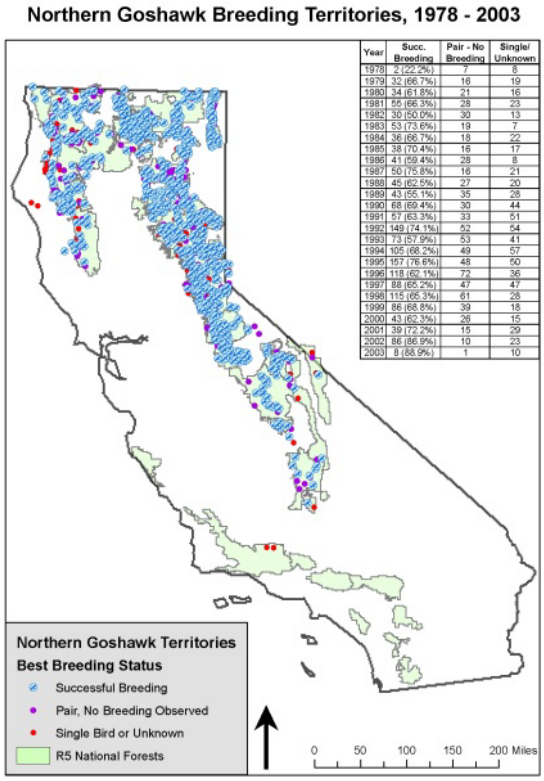

Figure 5. Northern goshawk breeding territories for the period 1978 to 2003. Map taken from USDA Forest Service 2006.

Goshawks are also extremely sensitive to noise and human presence in or near the nest stand during pair bonding, nest-building and incubation (Squires and Reynolds 1997; Keane et al. 2006). Nest failure has been repeatedly documented from research visits to nest areas before June (Keane et al. 2006). Even camping near nests can cause failure (Squires and Reynolds 1997). Noise and disruption associated with timber harvest operations (e.g., logging equipment, log truck traffic, road construction, timber cruising) can also cause nest failure even after nestlings have almost fledged in late June (*Ibid*). Unusually heavy road traffic or OHV use have the potential for similar negative impacts (USDA Forest Service 2001a).

c. Rationale for Not Recommending Goshawk as a Species of Conservation Concern is Not Supported by Recent Evaluations of the Species

The Planning Handbook provides factors to be considered in identifying species of conservation concern (SCC). The leading factor is whether a species has already been designated as at-risk through some reputable scientific process. In doing so, the Forest Service recognized that this creates an initial impression of concern about the species' persistence in the plan area. If the Forest Service decides that there is not a substantial concern for persistence in the plan area for such species, the agency must document evidence to counter the prior classifications. This could include new scientific information, or reasonable alternative interpretations of the existing information. No such reasons were given in the evaluation of goshawk for an SCC.

There are no reasons allowable in the FSH 1909.12 (Ch 10 12.52d), regarding goshawk abundance, distribution, lack of threats, positive trends in habitat, or positive responses to management, that would lead the agency to not identify goshawk as a species of conservation concern. Nor is there lack of sufficient information about the species' status that leaves the evaluation process uninformed regarding the status of goshawk in the Sierra Nevada.

The rationale for not recommending goshawk as an SCC states that goshawk habitat is within "NRV" and is readily available on these three national forests, and the species is secure throughout its range. But, this rationale is perplexing for several reasons. First, the rationale later states that there is not enough information to determine what goshawk habitat needs are. The conclusion that goshawk are not an SCC because they have plenty of habitat despite it being unclear what goshawk habitat is, doesn't make sense. Second, the rationale that the species is secure throughout its range is in disagreement with the California Department of Fish and Wildlife's recent assessment of the species, and requires more explanation for the public and decision maker. Finally, suggesting that the dense ponderosa pine, mixed conifer, red fir, and upper montane forest habitat goshawks rely on for nesting is within NRV is the equivalent of saying such areas meet desired conditions and are not in need of management action. Such a rationale contradicts the very foundation of the DEIS, a document that states (p. 369):

> Throughout the three national forests the habitat in the montane zone is becoming increasingly dense and homogenized under the current management approach (see "Terrestrial Vegetation Ecology" section). There is little vertical structural complexity and diversity, and low levels of habitat heterogeneity. These conditions are generally the result of decades of fire suppression, relatively slow treatment rates, limited treatment tools, emphasis on treatments at the patch and stand scale (instead of landscape scale) in the wildland-urban intermix, and requirements to retain all large-diameter trees and dense canopy cover everywhere except in the wildland-urban intermix. Forested habitat within this zone is moving further away from conditions that support at-risk terrestrial wildlife species. There is generally a lack of habitat heterogeneity and structural complexity that supports terrestrial wildlife, particularly prey species. Increasingly uniform canopy condition from the rapidly growing understory of shade-tolerant trees reduces the amount of sunlight needed to maintain the understory shrub layer that supports forage and cover for a variety of prey species.

This rationale also contradicts the goshawk threats analysis in the Biological Evaluation (p. 217), which states:

> Habitat loss and degradation are the primary known threats to northern goshawks (Squires and Kennedy 2006). As a result of timber harvest and fire suppression policies over the past century, contemporary California forests are strikingly different in structure, composition, and function compared to the range of forest conditions resulting from the historic, natural disturbance regime. These recent management policies have likely degraded goshawk habitat quality by fragmenting forests, reducing the amount and distribution of mature and old-growth forest stands and large trees, increasing understory tree density, and

> changing tree species composition, resulting in broad-scale reduction of the proportion of pine in forest stands. Nest sites and territories have been lost from logging in nest stands and from stand replacement fires. There is also increased risk of loss of habitat to such fires because past management policies have increased fuel loads.

Last year, the state of California increased the level of concern for goshawk and designated it as a "species of greatest conservation need" for the Sierra Nevada bioregion in the state wildlife action plan (SWAP, CDFW 2015). Key pressures identified in the SWAP for habitats occupied by northern goshawk were fire and fire suppression, logging and wood harvesting. There is even further information that points to significant concern for goshawk in the California. The Northern goshawk is also ranked by NatureServe as S3 in California, where it is considered to be vulnerable. And further, an extensive review of California bird species in 2008 by Shuford and Gardali determined that northern goshawk was a species of special concern in California due to a reduction in range declining population, low population numbers, contribution in California to the taxon's range, and threats. Even within the Forest Service's own recent evaluations of the conservation status of goshawks there are conflicting recommendations.

The Region 5 document called "Appendix A: Sensitive Species Evaluation Form" reviewed on February 28, 2012, states: "Management considerations for breeding in [sic] this species should include protection of upper montane forests, protection of specific forest patches used for breeding, and fire management that more closely approximates pre-suppression conditions." (p. 4). In 2012, reviewers told the Forest Service that habitat protection was needed to ensure goshawk reproduction, and thus viability, in the plan area. There has been no new information presented by the agency, or scientists, to contradict this conclusion. Information provided by these evaluations, as well as by state agencies, do not support the Forest Service's rationale to not recommend goshawk as an SCC for these national forests.

The rationale given to not include goshawk as an SCC on the Sierra NF (SNF 2016) mentions limiting factors for goshawk, including "nest sites, habitat, and prey availability." (SNF 2016, p. 17). This evaluation states that "past timber harvest that resulted in a loss of large diameter trees and or foraging opportunities princip" then the sentence just stops without explanation (p. 17). It appears as though the rationale provided is incomplete, and is in the process of being edited. This only adds to our concerns about how the agency weighed information in making this decision.

If the Forest Service has previously listed a species as "sensitive", there should be a substantial burden on the Forest Service to explain why the best available science no longer supports a concern for viability. It must specifically address the prior agency findings regarding viability for goshawk. No such reason not to identify goshawk as an SCC was given.

Northern goshawk has been designated a Regional Forester's Sensitive Species in Region 5 since the mid-1980s. Its status in the Sierra Nevada was recently reviewed and the region confirmed in 2013 that it still belonged on the revised RFSS list (USDA Forest Service 2016a). Concern about low population numbers and habitat degradation from logging led Region 5 to include conservation measures in the Regional Guide (1980) prepared to support the creation of the first forest plans in the 1980s. These early conservation measures were later modified by forest plan

amendments in 2001 and 2004 to improve conservation of nesting birds with the objective to maintain viable populations of this species in the plan area. These forest plan amendments identified the conservation of old forest and associated species as one of five key issues in need of improved management in the Sierra Nevada. Northern goshawk was identified as an at-risk species associated with old forests. The amendments affected eleven national forests.

Under current management direction (USDA Forest Service 2004), 200-acre goshawk nest stands are protected from significant structural alteration from logging projects. Any rationale for why the species should not be considered an SCC must consider how current management has benefited the species, why the current management direction is no longer necessary, and the likely effects changing such management direction would have on the species. In addition, the proposed change to goshawk management is not simply a forest plan and SCC issue, the proposed change would have a significant effect on the human environment and therefore should be addressed and analyzed through the NEPA process. The extent of the analysis in the BE (p. 218) on the effects of the effects of each of the proposed action alternatives on goshawk is limited to:

> "Late seral stage habitat is within each alternative and the combination of large trees as well as snags is provided for in each alternative. Climate change concerns are being considered and allowing for late seral habitat corridors and landscape linkages. Risks due to uncharacteristic wildfires is ameliorated by the restoration that is proposed."

Clearly, this analysis does not address how the changes in forest management direction under Alternative A to any of the proposed action alternatives would affect goshawk.
It is important to recognize situations where threats outside of the plan area may cause concern for persistence of a species in the plan area. For this reason, it is not sufficient for the Forest Service to simply use lack of threats in the plan area as a justification for not selecting a species as an SCC. The rationale must also address the threats to the species as a whole, and explain why they do not create concern that would apply to populations in the plan area. If the national forest is actually a stronghold for a species doing more poorly elsewhere, this could even be a reason for more protective plan components.

It is also important to remember that species do not need to be threatened by management actions in order to be identified as an SCC:

> "Regardless of the influence of NFS management on species, a species may be identified as an SCC if "the best available scientific information indicates substantial concern about the species' capability to persist over the long- term in the plan area" (36 CFR 219.9). Neither the definition of SCC at (36 CFR 219.9) nor the Directives (FSH 1909.12 ch 10 12.52 through 12.53) indicate that a species must be threatened by agency management to be identified as an SCC." (Hayward et al. 2016, p.22).

d. The Forest Service Decision to Not Identify Goshawk as a Species of Conservation Concern Does Not Use Best Available Science

The Forest Service does not explain how best available scientific information was applied in the decision to not identify goshawk as a Species of Conservation Concern, as required under the planning rule, 36 CFR 219.3.

As mentioned above, recent designation of goshawk as a California "species of greatest conservation need" for the Sierra Nevada bioregion in the state wildlife action plan ('SWAP', CDFW 2015) is contrary to the Forest Service's finding that goshawk is "secure in its range, except Nevada." If the species is vulnerable at the global or state level, then they are not considered secure. This statement must be supported by best available science that addresses the species vulnerability, not just presumptions about current habitat availability on National Forests prior to plan implementation (see goshawk section above). Furthermore, the evaluation by Shuford and Gardali (2008) is considered to be the "definitive treatment of the status of declining and vulnerable bird populations in California"[20] The authors used the structured ranking system developed for the process to determine that northern goshawk was a species of special concern in California due to a reduction in range declining population, low population numbers, contribution in California to the taxon's range, and threats.

As reported by the Forest Service in 2006, and Keane (2008), densities of known breeding territories where considerably lower in the southern Sierra Nevada compared to elsewhere in the bioregion (USDA Forest Service 2006, see USFS goshawk range map in the NFMA section above). These citations were listed in a table format, but how Forest Service applied this information to the decision to remove goshawk from the SCC list is not adequately explained.

Recent information illustrating goshawk vulnerability to climate change was not used to inform the plan decision not to include goshawk as an SCC, either. The threat of habitat modification to northern goshawk and a variety of species associated with old forests was a principle reason driving the forest plan amendments in 2001 and 2004 on eleven national forests in the Sierra Nevada. Protection of nesting habitat through the establishment of a protected activity center (200 acres around a nest stand) was adopted in response to the work by Woodbridge and Detrich (1994) on re-occupancy. This measure and other measures to limit logging were adopted with the objective of reducing the threats to this species and providing for its persistence. The Forest Service does not explain how scientific information was revaluated and reapplied in novel ways to support the decision to exclude goshawk as an SCC. In fact, the decision is arbitrary and lacks rationale.

Additional information in support of designation as an SCC is provided in the species account for northern goshawk included in Britting et al. (2012). This information was included in scoping comments submitted to the Revision Team in September 2014.

[20] See forward by Fish and Game, p. v. in Shuford and Gardali (2008).

e. Recommendation

We ask that northern goshawk be included as an SCC and that standards and guidelines be included in the revised plan to reduce known threats from logging and other disturbance. Standards and guidelines that should be adopted in the revised plans include protected activity centers, survey requirements, limited operating periods and habitat retention requirements. The additional recommendations that we submitted during scoping in *National Forests in the Sierra Nevada: A Conservation Strategy* (Britting et al;. 2013) should also be included in the revised plans.

3. Black-backed Woodpecker

The evaluation of black-backed woodpecker to date has not addressed the available information on status and trend, has not addressed the extensive literature on this species, and has not incorporated the detailed, science-based comments we submitted for this species in July 2015 and February 2016 [21] Thus, the review does not meet the best available science information (BASI) standard.

The SCC rationale fails to mention that the black-backed woodpecker: 1) received a positive ESA 90-day finding; and 2) is currently designated as "imperiled" (S2) in California.[22] This information alone strongly supports inclusion on the SCC list. In addition, a long list of reports and published papers exists regarding the status, the trends, habitat conditions, and threats to black-backed woodpecker, yet the most recent SCC tables fail to acknowledge this extensive literature. Of significant concern is the failure to note post-fire logging as a threat and the omission of black-backed woodpecker in the table for the Inyo National Forest. Moreover, while we have been told that species experts have been consulted about the SCC list, inquiries to several black-backed woodpecker experts indicate they were not contacted.

The rationale provided by the Forest Service for not including the black-backed woodpecker on the SCC list states that "proposed actions of the revised forest plan…are expected to result in more high-severity burned habitat in the plan area throughout the plan period, while also sustaining green forest habitat (that includes snags) for this species." This statement is misinformed in several ways. First as mentioned in our general comments above, it is inappropriate to rely on current or future management when evaluating inclusion on the SCC list. Second, it fails to identify that post-fire logging, an action under the control of the agency, is a threat to this species. The body of scientific literature that establishes post-fire logging as a threat is vast and it is remarkable that the documentation simply ignores this. Lastly, the documentation fails to acknowledge that the best available science (e.g., Rota et al. 2014; Fogg et al. 2014) shows that green forest is secondary habitat for the black-backed woodpecker and is not known to be capable of supporting viable black-backed woodpecker populations.

There is a long list of literature available for this species much of which was funded to a significant extent by the Forest Service. This literature explains that black-backed woodpeckers

[21] We incorporate the comments submitted to the agency on SCC in July 2015 and February 2016 by reference.
[22] California Department of Fish and Wildlife, Special Animals List, January 2016: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline=1

in California are separate from the black-backed woodpeckers in boreal forests (Pierson et al. 2010 ["a barrier likely exists between Oregon and the boreal forest…values are similar to those documented among subspecies or separate clades…."]). Furthermore, "substantial concern" exists for the black-backed woodpeckers in California because:

- Their primary habitat, severely burned forest, is ephemeral, both temporally and spatially, and even in large fires can be of limited availability, e.g., Casas-Planes et al. (2016) found that "Optimal and potential habitat for Black-backed Woodpecker comprise 53.7 km2 and 58.4 km2, respectively, representing 5.1 and 5.6% of the overall footprint of the Rim Fire."

- This primary habitat is targeted for logging immediately post-fire (at 1-2 years), which coincides with the time when such habitat is of greatest value to black-backed woodpeckers. As recently published in Siegel et al. (2016), "results indicate that natal dispersal is the primary means by which Black-backed Woodpeckers colonize recently burned areas in western forests, and that breeding dispersal is uncommon. The decline of Black-backed Woodpecker populations 6–10 yr after fire likely reflects the lifespan of individual birds that colonized the burned area, or of offspring that they produced in the early postfire years."

- Not only is burned forest habitat limited in general, even when it does exist, there is limited availability of nest trees within it (Lorenz et al. 2015). "Our findings suggest that past studies that did not measure wood hardness counted many sites as available to…when they were actually unsuitable, potentially biasing results. Moreover, by not accounting for nest site limitations…managers may overestimate the amount of suitable habitat. We therefore urge ecologists to incorporate quantitative measures of wood hardness into…nest site selection studies, and to consider the limitations faced by avian cavity excavators in forest management decisions" (*Id.*)

- Post-fire logging has been and continues to be a serious threat to black-backed woodpeckers. For example, the Forest Service's regional estimate of habitat for the species show a loss of 35% of black-backed woodpecker habitat over the past 8 years due to logging on public and private lands within the Sierra region.

- Post-fire logging clearly harms woodpecker habitat as evidenced, for example, in Siegel et al. (2013) (map of black-backed woodpecker locations with the caption "Note the general absence of foraging locations within the post-fire harvest areas"), Campos and Burnett (2015) ("Black-backed Woodpecker…decreased with increasing area salvaged"), and many other publications. This is largely because the very snags that are most heavily targeted for removal in post-fire logging projects are the very snags that these woodpeckers prefer when foraging – medium and large snags (Siegel et al. 2013; Siegel et al. 2014). For example, "Our past findings (Siegel et al. 2013) show that Black-backed Woodpeckers in burned forests of California preferentially select larger, dead trees in more severely burned areas for foraging" (*Id.*)

- Current post-fire logging projects on National Forest lands in the Sierra Nevada illustrate at least two additional significant problems for black-backed woodpeckers: (1) in the only instance where actual surveys were conducted for black-backed woodpeckers post-fire (the King fire area), it turned out that far fewer black-backed woodpeckers were present than had been accounted for by modeling, and moreover, the areas identified as containing actual black-backed woodpeckers were overwhelmingly (80%) approved to be logged by the Forest Service; and (2) the logging approved in the 2014 fires (Bald, Eiler, French, and King Projects) represents a substantial increase in intensity/degree of removal of black-backed woodpecker suitable habitat relative to past years. This issue is further magnified by the fact that black-backed woodpecker habitat is ephemeral, meaning that while the USFS' regional analysis (2007-2014) speaks to treatment of 20% of USFS burned forest black-backed woodpecker habitat (and 35% on all lands), as treatment intensity increases annually over time, and burned forest otherwise ceases to support black-backed woodpeckers, less and less habitat will be available for black-backed woodpeckers. This current trend is especially concerning in light of the overall low amount of habitat in the bioregion in burned forest—only 223,000 acres even using the Forest Service's numbers from its most recent "regional analysis" (which include areas that are likely not high quality black-backed woodpecker habitat).

- Available information indicates that black-backed woodpecker populations may be declining. Appendix A of Roberts et al. (2015) found that a "sharp decrease" in black-backed woodpecker populations is occurring in unburned forests throughout the Sierra Nevada in recent years (Roberts et al. 2015, p. 39), and concluded that the data indicate a "strong change in green forest occupancy" appears to be occurring (Roberts et al. 2015, p. 40; Figure A.1, p. 42). In a separate study conducted by the Institute for Bird Populations in burned forest, the authors found that occupancy in 2013 and 2014 were the lowest since the study began in 2009, and 2014 was the lowest year of all (Siegel et al. 2015, p. 2). We note that the studies above were funded in part by the Forest Service to assess population and habitat trends for this species.

- While secondary habitat exists for black-backed woodpeckers in unburned forest (Fogg et al. 2014), the best available science shows that such habitat is very likely of marginal value at best (e.g., Rota et al.2014, "population growth rates were positive only in habitat created by summer wildfire"; Siegel et al. 2013, showing unburned forest home ranges to be substantially larger than burned forest home ranges; this is indicative of poor quality, and means the woodpeckers are traveling much farther, and expending far more energy, to obtain food). Thus, unburned forest cannot be relied on to dismiss concern for this species, and this is especially so given the low level of detect in unburned forest and the recent "sharp decrease" in such detections.

- Audubon (http://climate.audubon.org/birds/bkbwoo/black-backed-woodpecker) and Stralberg and Jongsomjit (2012) predict substantial range contractions for the black-backed woodpecker in the Sierra Nevada in the coming decades due to a large-scale loss of higher-elevation montane and subalpine conifer forests from climate change.

The best available science information above and in our prior comments on draft lists for SCC submitted in July 2015 and January 2016 support the inclusion of black-backed woodpecker on the SCC list. We ask that you include this species on the final SCC list and develop forest plan components, including standards and guidelines, to provide the necessary ecological conditions and maintain viability.

D. California Spotted Owl

1. Best Available Science Information on Spotted Owl Demography and Ecology

In 2006, the U.S. Fish and Wildlife Service determined that listing the California spotted owl was not warranted (Service 2006). The 2006 determination was primarily based on three factors: (1) there was inconclusive evidence that California spotted owl populations were in decline, (2) high severity wildfire represented the greatest threat to the species, and (3) Forest Service-implemented fuels treatments did not represent a significant long-term (greater than 20 years) threat to the species and were necessary to mitigate the long-term threat of high severity wildfire. Since 2006, a substantial body of scientific literature has been published that calls into question the basis of the Service's 2006 not warranted determination, including: (1) conclusive evidence of a range-wide decline in California spotted owl abundance and occupancy on all Forest Service-managed lands with long-term demographic monitoring data (Conner et al. 2013; Tempel and Gutiérrez 2013; Tempel et al. 2014a); (2) correlation between activities that reduce canopy cover (i.e., Forest Service logging) and reduced colonization, reproduction, and increased territory abandonment probabilities (Seamans and Gutiérrez 2007a; Stephens et al. 2014; Tempel et al. 2014b); (3) wildfire within territories has had no discernable effect on occupancy throughout the Sierra Nevada (Lee et al. 2012); (4) low and moderate severity burned forests maintain essential habitat characteristics and do not affect occupancy (Roberts et al. 2011); (5) mixed and high severity burned forests are used for foraging and do not represent a categorical loss of habitat (Bond et al. 2009a, Bond et al. 2013); and (6) post-fire management practices (i.e., salvage logging and industrial reforestation) on public and private lands results in the long-term degradation of foraging habitat and nesting and roosting habitat.

Over the past two years, two petitions to list the California spotted owl have been submitted to the U.S. Fish and Wildlife Service. We are including our petition to list the California spotted owl (Sierra Forest Legacy 2015) for the Forest Service to consider in the adoption of revised plans. Based on the information presented in the petitions, the U.S. Fish and Wildlife Service issued a positive 90-day finding to list the California spotted owl. A positive 90-day finding indicates that the Service believes that substantial scientific or commercial information was provided by the petitioner and that the petitioned action may be warranted. It is probable that the outcome of this forest planning process will weigh heavily on the U.S. Fish and Wildlife Service's ultimate decision to list or not the California spotted owl.

The Forest Service should recognize in the DEIS that the basis of the U.S. Fish and Wildlife Services last "not warranted" determination on the California spotted owl was founded on assumptions no longer supported by the best available science. The Forest Service must also document and use the best available science to develop the forest plans and analyze the effects of

the forest plans to the California spotted owl. The following are key findings from research papers that should be used in the forest planning and analysis process.

a. Population Decline on Forest Service Ownerships

All California spotted owl populations on Forest Service-managed lands with long-term demographic data declined over their respective study periods. The best available science information indicates that:

- The population of the San Bernardino demographic study area declined by about 9 percent each year from 1987 to 1998 (65 percent over the study period) (LaHaye 2004, page 1662). The San Bernardino population is no longer monitored at the level it once was.
- Tempel and Gutiérrez (2013, page 7) compared occupancy modeling with the statistical methods typically employed to calculate the annual rate of population change (λ_t) in previous studies and found that occupancy results mirrored the change in population results, but the confidence intervals of the occupancy results did not overlap 1. From 1993 to 2010, spotted owl occupancy declined by 30 percent, territory extinction increased over time, and colonization rates were insufficient to maintain occupancy at its initial level on the Eldorado demographic study area (Tempel and Gutiérrez 2013, page 7).
- Over the 18-year study period, Conner et al. (2013, page 1456) found that it is probable that the populations of CSO in the Lassen-Plumas and Sierra National Forest demographic study areas declined. Estimates suggest that the population declined by 21 to 22 percent on Lassen-Plumas demographic study area and 11 to 16 percent on the Sierra demographic study area (Conner et al. 2013, page 1454).
- The only population with long-term demographic data that has been found to be stable or increasing was in Sequoia-Kings Canyon National Park (Conner et al. 2013, page 1454), suggesting the decline is not a Sierra Nevada-wide phenomenon.
- Using a new statistical method called an integrated population model, Tempel et al. (2014a, page 91) calculated the posterior means of realized population change for the Eldorado demographic study area and found that between 1990 and 2012, the population declined by 50 percent, with 95 percent credible intervals suggesting the true decline was between 38 and 61 percent.

It is important to note that from the early 1990s through 2012 there was very little to no high severity wildfire activity within the four Sierra Nevada demographic study areas. This means that the observed declines were unrelated to the effects of wildfire or post-fire salvage logging.

It is also important to recognize that confidence intervals that overlap zero do not indicate a population is stable, despite such an assertion in the BE (p. 27). Conner et al. (2013, p. 1450) point out the limitations of such interpretations finding that, "In the past, the confidence intervals (CI) for estimates of mean λ_t and of Δ_t were used to evaluate population decline. That is, if the CI included 1, even if just barely, the conclusion was that there was no evidence for a decline. However, with this methodology, the influence and probability of a Type II error (inability to detect a decline or change) cannot be eliminated from the interpretation of no decline." It was

precisely for this failing that Conner et al. developed their method to robustly estimate risk, or probability of declines, for retrospective analyses of monitored populations.

b. Habitat Use within a Territory in Unburned Forests

Since 2004, a number of studies have evaluated habitat use of unburned forests by spotted owl. The best available science information overwhelmingly indicates that the amount and alteration of high canopy cover forest within a CSO **territory** (defined as half the mean nearest neighbor distance) can cause significant effects to important demographic parameters:

- Alteration of 50 acres or more of mature conifer forest (conifer forest with greater than 70% canopy cover dominated by medium and large trees) within a spotted owl territory increased dispersal probability and reduce colonization; and territory extinction was negatively related to the amount of mature conifer forest within a territory (Seamans and Gutiérrez 2007, page 573).
- Home range size increased with the amount of logging within the home range (Gallagher 2010, page 20).
- Medium-intensity timber harvests, characteristic of proposed fuel treatments, were negatively related to reproduction of spotted owls, with reproduction appearing sensitive to modest amounts of medium-intensity harvests (Tempel et al. 2014b, page 2098).
- Reductions in canopy cover were associated with reductions in spotted owl survival and territory colonization rates, as well as increases in territory extinction rates (Tempel et al. 2014b, page 2099).
- There was a positive association between the amount of high (greater than 70 percent) canopy cover forest dominated by medium- or large-sized trees and owl demographic rates (Tempel et al. 2014b, page 2100).
- Greater than 90% of medium intensity timber harvests, characteristic of proposed fuel treatments, converted high-canopy forests into lower-canopy vegetation classes, suggesting that landscape-scale fuel treatments could have negative impacts on populations of California spotted owls (Tempel et al. 2014b, page 2103).
- The effects of implementing medium intensity timber harvests immediately decreased average habitat suitability, with a difference still present after 30 years of simulated forest growth (SNAMP 2015, page 58).
- Declines in occupancy were expected under climate change when the amount of closed-canopy forest was constant over the modelling period, as well as in most cases when the amount of closed-canopy forest increased; however, increases in the amount of closed-canopy forest always moderated declines in occupancy (Jones et al. 2016a, page 5).

As demonstrated by the science information above, mature conifer forests (CWHR 4, 5, and 6) with canopy cover greater than 70 percent that include a large tree component is a necessary ecological condition on which CSO depend at the territory-scale. Although the DEIS cites many of these papers, it fails to acknowledge the strong correlation these papers found between CSO demographics and amount of forest with canopy cover greater than 70 percent at the territory scale.

Although not explicitly acknowledged in the DEIS, the Forest Service is aware of the species' affinity for mature forests with canopy cover greater than 70 percent at the territory scale. In late 2014, the Forest Service commissioned a group of prominent spotted owl scientists and forest ecologists from within and outside of the Forest Service to recommend changes needed to reduce risks to the California spotted owl and meet current goals for the conservation of the species (USDA Forest Service 2015a). A major feature of these recommendations was to maintain at least 400 acres of this necessary ecological condition within a territory. The interim recommendations were reviewed by managers from the national forests in the Sierra Nevada and the Regional Office. Furthermore, Alternative C supposedly includes all of the conservation measures outlined in the interim recommendations (DEIS, p. 14). According to the interim recommendations:

> Recent research, primarily in the central Sierra Nevada, indicates that successful territories (i.e., sustained survival and occupancy of a territory) have more than the 300 acres of high quality nesting/roosting habitat (defined as ≥ 70% canopy cover) in the vicinity of the activity center. We assume this new information is relevant and thus applicable to all locations in the Sierra. Two criteria for habitat designation and management at the territory scale are indicated: a minimum amount of habitat with ≥ 70% canopy cover, and total amount of habitat with ≥50% canopy cover (including the minimum ≥ 70% canopy cover) (Fig. 2). **Research from the central Sierra Nevada has provided strong evidence that maintaining 375 acres or more of habitat with ≥ 70% canopy cover within the territory has significant benefits in terms of occupancy and site fidelity.** (USDA Forest Service 2015a, p. 6; emphasis added).

Thus, the strong relationship between this species and specific levels of dense, mature forest is well known by the Forest Service and should have been addressed directly in the draft plans and DEIS.

c. Habitat Use in Burned Forests

There are relatively little data on the effects of high severity wildfire, in the absence of salvage logging, on spotted owls. Until recently (i.e., after the adoption of the 2004 Sierra Nevada Forest Plan Amendment), the conventional wisdom was that the effects of high severity wildfire on spotted owls and other old forest species were synonymous with clear cut logging, primarily due to the effects of each on live canopy cover, to which occupancy and reproduction are often correlated. However, the structural complexity of Complex Early Seral Forests (CESF), compared to salvage or clear cut logged forests, is extremely high and spatially heterogeneous due to the presence of scattered pockets of surviving trees, substantial levels of native shrubs and sprouting hardwood trees, and high levels of woody legacies, such as snags and downed boles. These habitat elements play numerous roles in structuring and facilitating the development of the recovering ecosystem, providing habitat for survivors and colonists, moderating the physical environment, enriching aquatic systems in the disturbed area, and providing long-term sources of energy and nutrients for all forms of life. Due to the differences in structure and biotic diversity between CESF and a clear-cut or salvage-logged forest, it stands to reason that the response of old forest species to these disturbance events would also differ.

We acknowledge there is likely a threshold at which the amount of high severity burned forest within a spotted owl territory significantly increases the likelihood of abandonment and reduces the potential reproductive output. However, such a threshold has not been clearly established, yet evidence from Lee et al. (2012) indicates that it could be greater than 32 percent of a spotted owl territory. It is probable that whatever the effects of high severity fire are on spotted owls, salvage logging likely interacts with those effects to increase the probability of territory abandonment (Clark et al. 2013). Observations of spotted owl behavior in the Rim Fire (USDA Forest Service 2014) indicate that spotted owls returned to historical nest stands with very little green forest remaining. For example, a territory with less than 50 acres of green forest remaining and dominated by 90 to 100 percent reduction in live basal had a territorial single and nesting pairs return to historical activity centers through the nesting season (August 2014) that followed the Rim Fire (August 2013).

At this time, most lines of evidence suggest that spotted owls require high canopy cover forest stands or patches for nesting in burned (Bond 2009, Roberts et al. 2011) and unburned forests (Verner et al. 1992), but the effects of fire on foraging and territory stability are more nuanced and complicated. Studies by Bond et al. (2009) and Roberts et al. (2011), studies with little to no post-fire salvage logging, suggest that low and moderate severity burned forests continue to be used by spotted owls for foraging and such burn severities do not appear to affect occupancy as many as 14 years post-fire. Although the sample size was low, Bond et al. (2009) found that for five of the seven owls in the study modeling indicated the strongest selection for foraging was in high-severity burned forest within 1.5 kilometers of the territory center. Based on a personal communication with M. Bond (2014), the largest high severity patches used for foraging in Bond et al. (2009) were greater than 200 hectares (494 acres) in size, with some foraging points located near the center of the largest high-severity patches.

While it is true the results of Bond et al. (2009) are limited by a small sample size and a relatively short post-fire duration (four years) and there are no data to suggest how use changes as the structure of the CESF changes; there are also no empirical data to suggest that use declines. In contrast to the effects of wildfire on spotted owl occupancy, it is common knowledge that clear cut logging, which has an identical effect on forest structure as salvage logging, adversely affects spotted owl occupancy, habitat quality, and reproductive success. However, a primary difference between salvage logging and clear cut logging is that salvage logging interacts with the effects of wildfire. As such, one could assume that the threshold at which the amount of post-fire salvage logging would result in territory abandonment or reduced reproductive success would be lower than for clear cut logging.

The best available science information indicates that CSO use burned forest of all severities at the territory and home range scales. The following studies highlight this use:

- Spotted owls selected all severities of burned forest for foraging and tended to select against unburned forest, modeling indicated the strongest selection for foraging was in high-severity burned forest within 1.5 kilometers of the territory center (Bond et al. 2009).

- Occupancy results from Yosemite National Park indicate that fire, as observed in the study area (i.e., 8 percent unchanged, 25 percent low, 29 percent moderate, and 14 percent high), did not reduce the probability of spotted owl occupancy up to 14 years post-fire; and of 19 spotted owl nests located, 9 were in burned survey areas (Roberts et al. 2011).
- No significant difference between burned (*n*=41) and unburned sites (*n*= 145) in probability of colonization or local extinction were detected, finding no significant effect of fire on occupancy dynamics for up to 7 years post-fire (Lee et al. 2012).
- A critical threshold at which high severity fire adversely affects occupancy in the Sierra Nevada was not detected and such a threshold is at least greater than 32 percent of a spotted owl territory burning at high severity (Lee et al. 2012).
- In southern California, when greater than 50 hectares of forested habitat burned severely, site occupancy probability decreased approximately 0.003 for every additional hectare of forested habitat severely burned; and post-fire salvage logging exacerbated the lesser site occupancy of burned versus unburned sites by decreasing occupancy probability an additional 0.05 (Lee et al. 2013).
- Occupancy of nesting territories by northern spotted owls in southern Oregon declined after fires because extinction probabilities increased as the combined area of high severity burned forest, salvage logging, and early seral forest (i.e., pre-fire clear cuts) increased (Clark et al. 2013).
- Result from the breeding season following the Rim Fire found that the probability for at least a single spotted owl was 0.922 and mean site-occupancy probability for a spotted owl pair was 0.866 (Lee and Bond 2015, page 233).
- Three to four years post-fire, spotted owls strongly selected for foraging sites close to their territory center, selected for riparian areas, and forest burn severity was not significantly associated with probability of use (Bond et al. 2016, page 7).
- As a result of the King Fire, occupancy in the Eldorado demographic study area declined by 22 percent, the greatest single year decline over the 23-year study period, and spotted owls avoided foraging in areas that burned at high severity (Jones et al. 2016b, page 304).

Considerable research has been undertaken in recent years on spotted owls' use of burned landscapes. While some of this information has been included in the DEIS, some of it has not. All of the information we provided on burned forest habitat should be included in the DEIS and used to develop forest plan components that maintain the necessary ecological conditions for spotted owl persistence in post-fire landscapes.

d. Conservation Assessment and Interim Recommendations

The Interim Recommendations on spotted owl management USDA Forest Service 2015a) were developed based on the Conservation Assessment for California Spotted Owl (Gutierrez et al. in press). Both of these documents were developed by some of the leading spotted owl and Sierra Nevada forest and fire ecologists and represent the best available science on the species and the effects of habitat management. Important findings from Gutierrez et al. (in press) that should be incorporated into the DEIS analysis include:

"strategies that reduce canopy cover, the complexity of forest structure, or large tree density have the potential to impact spotted owl populations negatively in both the short- and long-term" (p. 217)

"spotted owl populations may be small compared to historical levels and limited by the spatial extent of old forest and forests with legacy elements" (p. 218)

"expansion of treatments that simplify forest structure and decrease forest tree canopy cover in owl habitat could exacerbate population declines and increase the probability of extirpation of owls from the region" (p. 218)

"whether fuel treatments will protect spotted owl habitat from high-severity fire sufficiently to compensate for potential short-term impacts to populations is unknown" (p. 218)
"treatments would occur primarily in areas of the landscape dominated by younger forests with high small tree density and be designed to enhance foraging habitat and foster growth rates of large, retained trees to enhance resilience to fire when possible" (p. 218)

"conservation planning efforts would benefit from a quantitative risk assessment" (p. 219)

"halting and reversing substantial recent population declines of a species of concern, like the spotted owl, is an essential component of a conservation program" (p. 218)

"territory occupancy and demographic rates are likely to fare better with a gradient of less intensive to more intensive forest management activities within owl habitat as a function of distance from activity centers" (p. 220)

"maintaining existing nesting habitat (particularly at sites that have a history of use) is likely to promote viable populations" (p. 220)

"within territories, spotted owl occupancy and fitness appear to be positively related to acreage of high quality habitat (i.e., forests dominated by large trees and particularly higher canopy cover), and a landscape populated by territories containing a sufficient amount of these habitat conditions is likely to promote viable spotted owl populations." (p. 221)

"At [the home range scale], there is an opportunity to place greater emphasis on fuels management and forest restoration, particularly approaches that enhance forest resilience, landscape heterogeneity, and spotted owl foraging habitat" (p. 221)

Much of this information is not included in the analysis for the DEIS and conflicts with the unsubstantiated claims in the DEIS. And importantly, Gutierrez et al. (in press) found that "the viability of spotted owls in the Sierra Nevada depends on carefully balancing fuel and restoration treatments with the maintenance and enhancement of existing owl habitat." (Gutierrez et al. in

press, p. 220) Based on this finding, they recommend the completion of a quantitative risk assessment which would require close coordination among wildlife ecologists, forest and fire ecologists, and remote-sensing scientists, as well as the development of an integrated model that links fire behavior, forest conditions, and spotted owl habitat/demography at the appropriate spatial and temporal scales." (Id.) The DEIS purports to "assess" the risks to spotted owl from logging allowed by the draft plans, but falls far short of the recommendations by these scientists to complete an quantitative assessment of risk and benefit that links to owl habitat conditions and demography in order to determine the conditions that would maintain a viable population of this species.

e. Conclusion

The draft forest plans and the effects analysis in the DEIS do not consider several important studies or key findings of studies that are cited on spotted owls. The forest plan and the DEIS also universally ignore habitat associations at the territory scale. In order to fully and accurately disclose the effects of logging on spotted owls requires applying the best available science and considering how spotted owls will respond to logging at all spatial scales, not just the PAC scale. Spotted owls depend on unburned high canopy cover forest and use burned forest outside of PACs for foraging, and almost all studies that consider the territory scale find that management activities that occur outside of the PAC may have significant adverse effects on occupancy, colonization, and reproduction. The interim recommendations for spotted owl (USDA Forest Service 2015a) were developed using this information and represent the best available science for minimizing adverse effects to the species when designing logging projects.

2. Effects of Logging >70 percent Canopy Cover in Territories not Addressed in DEIS

The evaluation of short and long term risk is essential in any assessment of species that are declining or at-risk. The DEIS identifies this, but then fails to provide the required analysis. We agree with the statement that, "The tradeoff under any management approach is finding an appropriate balance between short- term risks from restoration treatments and long-term gains from improvement in habitat condition," (DEIS, p. 375), yet the DEIS makes no effort to quantitatively compare or define the short- or long-term habitat costs and benefits between the alternatives for ecological conditions on which the species depends. For instance, the claims that, for Alternative B "the potential for short-term risks is lessened and balanced with the need for restoration" (DEIS, p. 375) and "improved resilience [in Alternative B] would have long-term positive benefits for the habitat condition and quantity for at-risk terrestrial wildlife species associated with mature forest habitat in these areas" (DEIS, p. 374) are not supported by data or a quantitative analysis. Furthermore, no quantitative evidence is provided that logging would increase the amount of spotted owl habitat over an undefined "long-term" period of time. In contrast to this statement, Gutierrez et al. (in press) state that, "fuel reduction and forest restoration strategies that reduce canopy cover, the complexity of forest structure, or large tree density have the potential to impact spotted owl populations negatively in both the short- and long-term." And, "Moreover, whether fuel treatments will protect spotted owl habitat from high severity-severity fire sufficiently to compensate for potential short-term impacts to populations is unknown." Furthermore, no quantitative evidence is provided that logging would increase the

amount of spotted owl habitat over an undefined "long-term" period of time. Yet, such an analysis is entirely possible to conduct and must be completed in order to meet NEPA's hard look standard and fully disclose and compare the effects of each of the alternatives on this declining species.

The DEIS repeatedly assumes that logging spotted owl habitat would have short-term effects to the species, but fails to link the short term effects to potential effects on population trends or increased risk to species already in decline or experiencing threats. For example, the DEIS does not consider or account for the fact that there are no limits to reducing canopy cover at the project level or that reaching desired conditions for canopy cover from a single mechanical treatment within a spotted owl territory quite possibly would result in territory abandonment, loss of occupancy, reduced colonization, and territory extinction. The DEIS also does not recognize the finding by Tempel et al. (2014b, p. 2101) that the treatment of just 7.4 percent of the high canopy cover in a spotted owl territory and outside of the PAC negatively affected habitat quality for more than 30 years. In cases when treatment effects result in territory abandonment, loss of occupancy, reduced colonization, and territory extinction, there would be no benefit to the affected spotted owl from the treatment, short- or long-term. **Territory abandonment, loss of occupancy, reduced colonization, and territory extinction are impacts that can occur in the short term which have long lasting effects.** As such, these are impacts that contribute towards a trend to federal listing, and are therefore significant and must be mitigated with proven remedies. Spotted owls have high survival rates, low fecundity, and rely on a forest structure that takes many decades to more than a century to develop. The extent, intensity, and frequency of mechanical treatments allowed under Alternative B and D would be capable of rendering a territory unsuitable to spotted owls in perpetuity. Such effects would be long-term and potentially occur across the landscape, resulting in the loss of viability within the plan area.

3. Correlation between Canopy Cover and High Severity Fire Not Demonstrated in DEIS

A recurring theme cited throughout the DEIS is that the high canopy cover forests spotted owls and fishers depend on are somehow inherently susceptible to high severity fire. This theme is used to suggest that logging spotted owl and fisher habitat is necessary to save the habitat from high severity fire. However, there is no evidence provided in the DEIS demonstrating that canopy cover in spotted owl habitat, or dense forest habitat for any species, must be reduced to increase resilience to wildfire. This is an issue we raised throughout the planning process. The failure to address this issue in the DEIS is a violation of NEPA's hard look standard. There are a number of studies and empirical evidence suggesting that canopy cover does not significantly contribute to wildfire hazard and there is no need to remove medium or large trees to increase fire resilience:

- According to the Forest Service (http://www.fs.fed.us/postfirevegcondition/index.shtml), for the four largest wildfires that occurred from 2008 to 2015 on the Sierra and Sequoia National Forests outside of wilderness, three of the fires had higher percentage of evergreen open tree canopy forest burn at high severity (i.e., Piute – 59%, French – 45%, and Rough – 46%) than evergreen closed tree canopy forest (i.e., Piute – 32%, French –

37%, and Rough – 27%). For the 20 largest fires in the Sierra Nevada during this time, this trend holds true. (Exhibit IV.1)

- Collins et al. (2011, page 84) compared the effectiveness of three different diameter limits on flame length across a landscape over a 30 year period (Figure 2). Their results suggest that across the landscape, there was virtually no difference in conditional burn probability between stands that had a 12 inch, 20 inch, or 30 inch diameter limit.

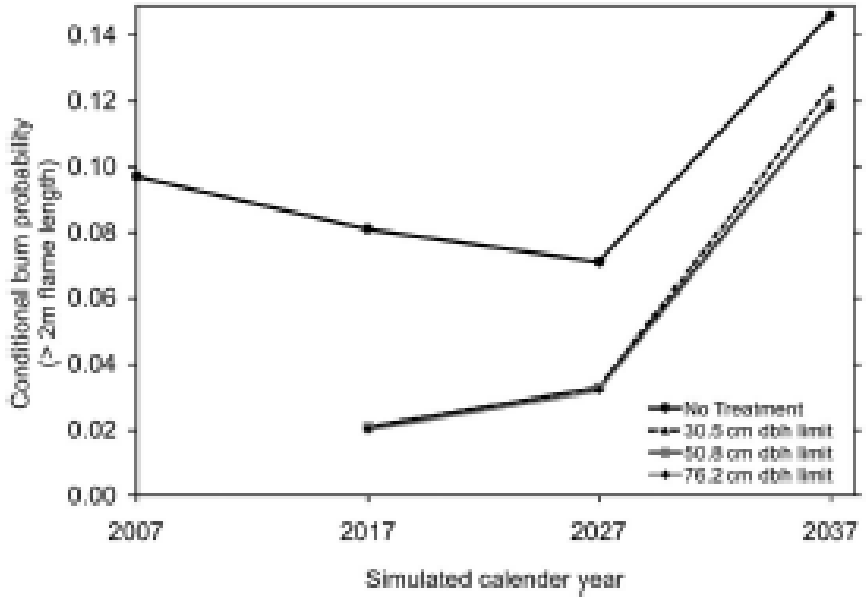

Figure 6. "Mean conditional burn probabilities across the Last Chance landscape for which simulated flame lengths are >2 m. Three diameter-limited thinning scenarios along with a no treatment scenario are reported. Each scenario was modeled into the future based on output from the Forest Vegetation Simulator, using our 2007 field inventory plot data as a baseline. Probabilities are based on 5,000 randomly placed ignitions simulated using RANDIG (see Methods for explanation). Note that the three thinning scenarios are nearly indistinguishable, with the exception of a slight departure for the 30.5-cm scenario in 2037." (From Collins et al. 2011, page 84).

- Agee and Skinner (2005, page 9) state: "Some effective fuelbreaks had only surface fuels and ladder fuels treated, with residual canopy cover exceeding 60–70%. Even though canopy bulk density was insignificantly reduced, fire severity was significantly reduced, suggesting that reductions in canopy bulk density are not always needed to reduce wildfire severity."
- Thompson and Spies (2009, page 1690) found that (Figure 3), "Open tree canopies with high levels of shrub-stratum cover were associated with the highest levels of tree crown damage, while closed canopy forests with high levels of large conifer cover were associated with the lowest levels of tree crown damage."

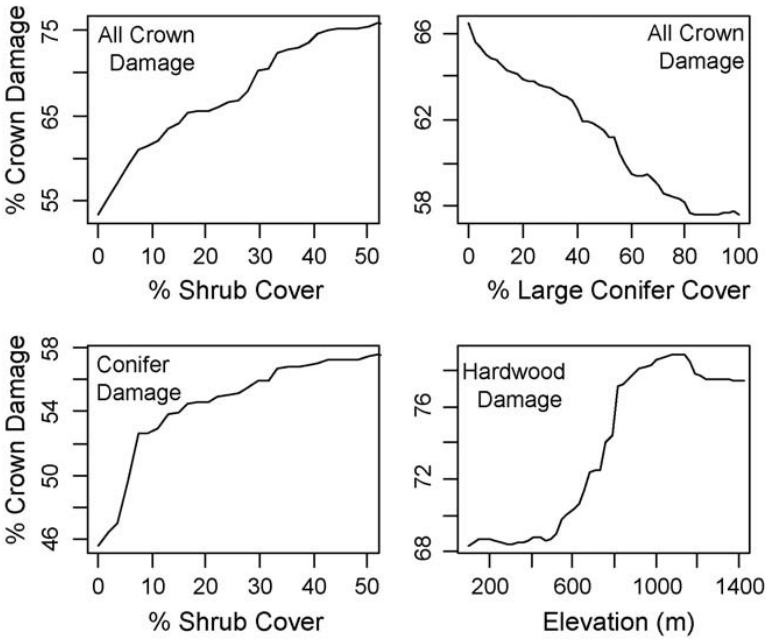

Figure 7. Partial dependence plots from random forest predictions of total crown damage on percent shrub cover; total damage on large conifer cover; conifer damage on percent shrub-stratum cover, and hardwood damage on elevation. Partial dependence is the predicted value of the response based on the value of one predictor variable after averaging out the effects of the other predictor variables in the model. From Thompson and Spies (2009, page 1690)

- Fry et al. (2015) found that the higher canopy cover forests of the Sugar Pine study area were more resilient to fire than the lower canopy cover forests of the Last Chance study area. The only spotted owl territory with treatment in the Last Chance study area was modeled to have more area burn at high severity post-treatment than pre-treatment SNAMP (2015).
- North et al. (2009, page 24), a report cited numerous times as a guiding document in the development of the draft forest plans, states: "What is achieved by thinning intermediate sized (20- to 30-in d.b.h.) trees? Some research suggests that for managing fuels, most of the reduction in fire severity is achieved by reducing surface fuels and thinning smaller ladder-fuel trees (see summaries in Agee et al. 2000, Agee and Skinner 2005, Stephens et al. 2009). What is considered a ladder fuel differs from stand to stand, but typically these are trees in the 10- to 16-in d.b.h. classes. If trees larger than this are thinned, it is important to provide reasons other than for ladder-fuel treatment."
- Spencer et al. (2016) show, in the panel below, that as the amount of high canopy cover forest and mean basal area in a fisher home range increases the observed proportion of high severity fire tends to decrease:

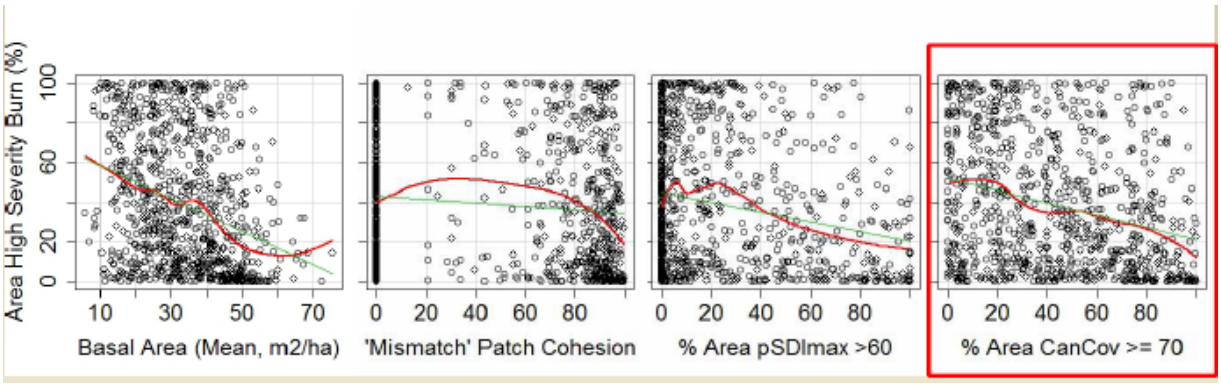

Figure 8. Proportion of high severity fire in relation to basal area, patch cohesion, percent SDImax, and canopy cover. Taken from: Status Update February 2016. Southern Sierra Nevada Fisher Conservation Assessment. Wayne Spencer, Heather Romsos, & Sarah Sawyer

This information overwhelmingly suggests that logging spotted owl habitat to reach desired conditions for canopy cover in a single entry and removing medium and large trees are unnecessary to improve fire resiliency. These data also suggest mechanical fuels treatments, regardless of intensity, only have a short-term effect on reducing wildfire hazard (approximately 15 years; Collins et al. 2011, page 84). The DEIS must acknowledge the findings of these studies and either provide evidence to the contrary or remove all references to the unsubstantiated idea that resilience to wildfire is somehow related to canopy cover and density of medium and large trees

4. Benefits to Spotted Owls from Logging Habitat Are Not Demonstrated in the DEIS

Spotted owl PACs make up a relatively small proportion of the entire mixed conifer, red fir, and yellow pine forest types in the plan area. The DEIS provides no evidence that the achievement of resilience is precluded across the landscape by the fuel conditions that occur within this small proportion of the landscape and violates NEPA's hard look standard.

According to the DEIS (p. 146) there are 746,000 acres of forest types that provide habitat for spotted owls (i.e., mixed conifer, yellow pine, and red fir) on the Sierra and Sequoia National Forests. According to Tables A-3 and A-4 of the DEIS (Volume 2, p. 4) there are 61,494 acres of spotted owl PACs within the plan areas. Based on this information, 8.2 percent of the forest types associated with spotted owls are currently designated as PAC and therefore, 91.8 percent of the forest types that provide habitat for spotted owls occurs outside of spotted owl PACs. In reference to the benefits of Alternative B, the DEIS states (p. 374) that, "Large, high-intensity fires are predicted to occur across the analysis area but fire-severity effects would be reduced in treated focus landscapes and other large areas with at least 40 percent of the area restored to vegetation desired conditions." However, the DEIS has not provided any evidence that treating 40 percent of the landscape requires logging one-third of 8.2 percent (2.7 percent) of the forest types that occur in spotted owl PACs every ten years and that such areas cannot be avoided by logging activities. Further, Dow et al. (2015) found that modeled treatments on 19 percent of a 47,500 acre project areas were projected to reduce the size of fire 36 to 43 percent and "that

incorporating constraints on the landscape at relatively modest levels (<25 %) may have similar desired effects as a treatment scenario that incorporates none."

Logging spotted owl habitat and degrading habitat quality are not necessary to increase the resilience of that habitat to wildfire, drought, or bark beetles and at no time has the DEIS demonstrated otherwise. In addition to the information we provided on the relationship between canopy cover and high severity fire, prescribed and managed fire are effective management tools to increase fire and bark beetle resilience that are under appreciated in the DEIS. A recent study on the ongoing drought and beetle mortality in the southern Sierra Nevada found that prescribed fire and fire managed for resource benefits, without pre-fire logging, significantly increased resilience to drought mortality (van Mantgem et al. 2016, p. 19). Roberts et al. (2011) found that a mix of fire severities did not reduce the probability of spotted owl occupancy, especially if numerous large trees remain post-fire. Studies by van Mantgem et al. (2016) and Roberts et al. (2011) took place on Sequoia-Kings Canyon and Yosemite National Parks, respectively. Both of these National Parks successfully reintroduced fire at a landscape-scale without pre-fire logging treatments, even after more than half a century of fire suppression. Furthermore, Sequoia-King Canyon National Park is the only location in the Sierra Nevada with long-term demographic study data suggesting that the spotted owl population is increasing. Together, these papers provide direct evidence that prescribed fire and wildfire managed for resource benefits can be used to increase resilience to bark beetles, wildfire, and drought within spotted owl territories without pre-fire logging or negative effects on occupancy.

All of the alternatives allow for management activities to reduce surface and ladder fuels within spotted owl habitat across the landscape, activities we strongly support. Even when spotted owl habitat occurs near communities and other high-value human constructs, there are no reasons provided in the DEIS explaining why treatment intensity on such a small portion of the overall landscape cannot be limited to activities necessary to reduce surface and ladder fuels.

5. The DEIS Fails to Take a Hard Look at the Short- and Long-term Effects of Logging on Spotted Owl Habitat Quality, Quantity, or Distribution

The DEIS suggests that the effects to spotted owl under the proposed action would result in short-term (undefined in the DEIS) effects and does not account for any long-term (undefined in the DEIS) losses in habitat quality, quantity, distribution. The claims in the DEIS are not supported by any quantitative or spatial analysis, even though the tools and data to complete such analyses are available.

The interim recommendations for spotted owl (USDA Forest Service 2015) provide important benchmarks and were designed to providing guidance during planning, "These recommendations constitute a suite of measures that individually hold promise and support in scientific literature pertaining to owls and forest ecology." (USDA Forest Service 2015a, p. 1) and "Research from the central Sierra Nevada has provided strong evidence that maintaining 375 acres or more of habitat with ≥ 70% canopy cover within the territory has significant benefits in terms of occupancy and site fidelity." (USDA Forest Serivce 2015, p. 6). Furthermore, the DEIS suggests that Alternative C, which reflects the interim recommendations, best minimizes the "short-term"

effects of mechanical treatments on spotted owls. Therefore, the effects of all other alternatives should be quantitatively weighed against the effects of Alternative C. This would ensure that the increased pace and scale of mechanical treatments in spotted owl habitat under Alternatives B and D do not result in significant reductions in abundance, range contraction, and loss of viability.

Using the moist and dry mixed conifer spatial data created to determine the proportion of spotted owl territories composed of greater than 50 percent dry mixed conifer forest (DEIS, p. 336), the Forest Service can use the best available science (i.e., Seamans and Guiterrez 2007; USDA Forest Service 2015a) to analyze the effects of each of the alternatives on the number of spotted owl territories that would provide 400 acres or more of CWHR 4, 5, and 6 forest with greater than 70 percent canopy cover within the range of the species and define where such territories would occur. Such an analysis would provide a spatial depiction of the distribution and connectivity CSO territories that would continue to provide such habitat conditions if canopy cover desired conditions were achieved within the planning period.

The draft plans allow habitat in significant portions of the protected activity center to be degraded or made unsuitable, but the DEIS does not evaluate this. The 300-acre spotted owl PAC-size was developed based on two findings provided in Verner et al. (1992, page 87), (1) the average nest stand size plus adjacent stands, and (2) activity centers that encompassed 50 percent of radio-telemetry locations from spotted owls on the Sierra National Forest; both were found to total 300 acres of high canopy cover forest. Plan component SPEC-CSO-STD-2 in the draft forest plans for the Sequoia and Sierra National Forests states: "Within community buffers and focus landscape, where greater than half of the protected activity center habitat is a dry vegetation type, up to one third of the protected activity center may be treated in dry vegetation type areas to improve resilience."[23] CWHR 6, 5D, 5M, 4D, or 4M are considered the "best available habitat" when designating spotted owl PACs in the draft forest plans. However, if one-third of a PAC is logged under the allowable limits provided in the proposed action, the logged-portion of the PAC may no longer be composed of CWHR 6, 5D, 5M, 4D, or 4M habitat and would technically no longer provide spotted owl nesting or roosting habitat; effectively reducing the size of the activity center by one third. In other words, SPEC-CSO-SSTD-2 allows managers to convert high and moderate quality PAC-habitat to forest stand structures that no longer fit the definition of PAC-habitat every ten years and the plan allows the treated area to be maintained in an unsuitable-habitat condition indefinitely.

Contrary to the analysis provided in the DEIS and considering how long it takes for CWHR 5D and 6 habitat to develop, logging one third of a spotted owl PAC that results in a condition not known to support an activity center and maintain such a condition for decades represents a significant adverse and long-term effect to the species. Even if the logging in question does not foreclose the ability of a spotted owl to use the logged portion of the PAC, SNAMP et al. (2015) found that treatment effects under the current plan, which did not include treatments in PACs or allow habitat to be reduced to less than 50 percent canopy cover, were likely to negatively affect habitat quality for more than 30 years. We also note that there is no plan direction defining if the

[23] We note that SPEC-CSO-STD-2 does not fit the definition of a standard because it is not a mandatory constraint on a project and activity decision making.

logged portion of a PAC is to remain designated PAC habitat, even if it no longer meets the definition of "best available habitat."

6. The DEIS Fails to Take a Hard Look at the Short- and Long-term Effects of Salvage Logging on Spotted Owl Habitat Quality, Quantity, or Distribution

There is only one standard or guideline provided in the draft forest plans that could potentially minimize the effects of salvage logging on spotted owls, SPEC-CSO-GDL-02 (SNF Draft Plan, p. 99). This guideline requires that spotted owl PACs be maintained regardless of occupancy status, except, "After a stand-replacing event, evaluate habitat conditions within a 1.5-mile radius around the activity center to identify opportunities for remapping the protected activity center. If there is insufficient suitable habitat within the 1.5-mile radius, the protected activity center may be removed from the network." The DEIS does not take a hard look at the ability of this plan component to minimize the effects of salvage logging on spotted owl occupancy or post-salvage habitat quality.

The DEIS recognizes some of the research on salvage logging and high severity fire on spotted owls, but fails to apply any of the study results to evaluate the short- or long-term effects of salvage logging, as allowed under each of the alternatives, on territory occupancy, reproduction, colonization, or distribution. In fact, the entire discussion on how salvage logging may affect spotted owls under the draft forest plan is limited to a single statement, "fine-filter plan components are in place to guide salvage projects in protected activity centers and suitable fisher target cells (SPEC-CSO-STD-06; SPEC-CSO-GDL-02a; Table 83)." (DEIS, p. 374). Such a statement certainly does not qualify as a hard look. This statement also highlights the fact that the only protective measure in place applies only to the PAC-scale.

7. The DEIS Fails to Take a Hard Look at the Effects of Removing PACs after 5-years of Negative Surveys

The draft forest plans allow for spotted owl PACs to be removed from the system after five years of negative survey results (SPEC-CSO-GDL-2b). However, the DEIS provides no analysis of the effects of removing spotted owl PACs from the system after five years of negative survey results on the number of PACs this guideline would likely affect over the planning period. Furthermore, no scientific rationale is provided for why five years is an appropriate timeframe for PAC retirement. The DEIS should discuss the likelihood of a PAC being reoccupied within 5 years if occupancy is lost due to mortality. Removing habitat protections for a declining species is a risky management strategy that is likely to reduce the ability of the species to recover and exacerbate the ongoing decline, especially if the loss of occupancy is due to logging. Considering that the draft forest plans allow logging one third of all spotted owl PAC-acres every ten years, there is a significant risk that such management activities will result in loss of occupancy, yet the DEIS claims that such logging is being done for the long-term benefit of the species. However, if logging the PAC results in loss of occupancy and the PAC is then retired and the remaining PAC-acres are logged and no longer provide habitat conditions known to support spotted owls, these activities will not benefit the species over the short- or the long-term.

8. Alternative C Incorrectly Characterizes the Best Available Science Information

We requested and received from the Planning Team information on how the California Spotted Owl Interim Recommendations (USDA Forest Service 2015a) were translated into Alternative B and C. The document we received was a table outlining the differences in California spotted owl management included in Alternative B versus Alternative C, with the expectation that the interim recommendations were fully reflected in Alternative C. Unfortunately, the Alternative C conservation measures included in this document were not designed for the Sierra or Sequoia national forests. Rather, the conservation measures defined for Alternative C in the owl comparison_06232016.pdf were designed for the Central Sierra Nevada. The conservation measures included in the IRs for the southern Sierra Nevada have a spotted owl territory size that is 800 acres and many of the conservation measures apply to 500 of those 800 acres. In contrast, the IRs for the Central Sierra Nevada have a spotted owl territory size that is 1,000 acres and many of the conservation measures apply to 700 of those 1,000 acres. It is troubling to us that the planning team does not appear to know what is being proposed for spotted owl in Alternative C. We ask that the description of Alternative C in the DEIS be revised to clearly reflect the recommendations for the southern Sierra Nevada defined USDA Forest Service (2015).

9. The Draft Plans Provide Less Conservation Compared to Existing Plans

According to the notice of intent to prepare an EIS for the Plan Revisions for the Inyo, Sequoia and Sierra National Forests (USDA Forest Service 2014, p. 18):

> "Existing management areas and direction for California spotted owl and northern goshawk protected activity centers and spotted owl home range core areas would be retained with clarifications and alignment of plan components. No substantive changes would be made with the following exceptions:
>
> - Updating and clarifying the desired conditions and other plan components for these areas based on information from the California spotted owl new interim guidelines and conservation assessment, when they are available.
> - Changing some standards and guidelines within the Community Wildfire Protection Zone and the General Wildfire Protection Zone to better balance the need to provide key habitat with managing the threat of wildfire impacts to communities and other values at risk. This would include minor changes to SNFPA 73 and converting and clarifying direction related to limited operating periods in SNFPA 75, 76 and 77 to guidelines.
> - Adding plan content and updating and clarifying standards and guidelines to include opportunities for adaptive management related to the amount of protected activity centers that can be treated mechanically (SNFPA 80 and 81) and with prescribed burning (SNFPA 78 and 79)."

Based on the following review of proposed changes to spotted owl habitat management, substantial changes to current management direction for spotted owl have been proposed in the

draft forest plans, contrary to the notice of intent to prepare the EIS. The species has declined under current plan direction and the proposed changes drastically reduce habitat protections and compromise persistence throughout the plan areas.

Mitigation measures afforded to spotted owl habitat under the current forest plan direction (Alternative A) include:

- Logging within 300-acre spotted owl PACs is prohibited, except within the WUI Defense Zone and in some limited cases in the WUI Threat Zone (USDA Forest Service 2004, p. 7).
- Outside of the WUI, treatment within 300-acre PACs is limited to prescribed fire (USDA Forest Service, p 7).
- In all cases, logging is prohibited within 500 feet of a CSO activity center (USDA Forest Service, p. 60).
- Vegetation treatments may occur in no more than 5 percent of PACs per year and 10 percent per decade, and logging within PACs may only occur in the WUI (USDA Forest Service 2004, p. 61).
- Canopy cover within 600-acre HRCAs should not be reduced to less than 50 percent and cannot be reduced to less than 40 percent (USDA Forest Service 2004, pp. 50-51)
- A 30 inch dbh limit on tree removal applies throughout the plan area (USDA Forest Service 2004, p. 50).
- PACs are maintained regardless of occupancy, except in cases of a stand-replacing event they may be remapped or retired (USDA Forest Service 2004, p. 37).

Owl scientists that reviewed the 2004 Sierra Nevada Forest Plan Amendment (USDA Forest Service 2004) concluded that these mitigation measures alone were not sufficient and management under the plan was likely to increase threats to the owl's viability, contributing to a trend towards federal listing (Verner 2003b; Blakesley and Noon 2003; Noon 2004; Bond 2003). These spotted owl scientists went on to suggest that logging medium and large diameter trees and the resultant reduction in canopy cover in spotted owl habitat, as allowed under 2004 Forest Plan Amendment, would drive the decline. We now have considerable evidence that these scientists were correct and, under current plan direction, the species has declined on all Forest Service-managed lands. The current forest plans did not reverse the declining trend and still allowed practices, e.g., the reduction of dense forest habitats, which increase the probability of territory abandonment. Despite these declines under current forest management, the draft plans provide even less conservation for this species compared to the existing plans.

The best available science information indicates that logging practices that reduce forest canopy cover to less than 70 percent within a spotted owl territory are likely to have significant adverse effects on colonization, dispersal, extinction, abandonment, and reproduction (Seamans and Gutiérrez 2007, Tempel et al. 2014b). The planning rule requires that plan components "provide the ecological conditions necessary to…maintain a viable population of each species of conservation concern within the plan area." 36 CFR 219.9(b)(1) However, there are no plan components included in Alternatives A, B, or D that ensure that any portion of any spotted owl home range, territory, activity center, or nest stand in the plan area will be composed of a sufficient amount of forest dominated by medium or large trees with greater than 70 percent

canopy cover. The forest plan must provide for this necessary ecological condition at specified levels and appropriate scales, informed by BASI, through standards or guidelines in order to conclude that the plan maintains species viability.

The draft plans do not include any fundamental shifts in spotted owl conservation in response to the population decline. Instead, the draft plans permit an increase in the intensity and extent of logging within spotted owl territories, PACs, and HRCAs. Such management activities are known to adversely affect colonization, reproduction, dispersal, and increased the likelihood of territory abandonment (Seamans and Gutiérrez 2007, Tempel et al. 2014b). In all instances, the draft plans include conservation measures that are less protective than the existing plans, such as:

- Doubling the amount of timber harvested.
- Allowing logging of one third of each spotted owl PAC and one third of all PACs every 10 years throughout the plan area[24] (current plan direction limits logging within PACs to 10 percent of all PACs per decade and only within PACs in the WUI).
- Prohibiting logging within 250 feet of an activity center (current plan direction limits logging within 500 feet of a nest).
- No canopy cover reduction limits in 600-acre HRCAs (current plan direction requires maintaining greater than 40-50 percent canopy cover in 600-acre HRCAs).
- Retiring PACs if unoccupied after 5 years of surveys (current plan direction is to maintain PACs indefinitely, unless severely burned).
- No diameter limit on tree removal over about half a million acres, most of which is within the range of CSO (currently there is a 30 inch diameter limit throughout the plan areas).

None of the measures listed above or otherwise included in Alternatives B and D require maintaining a minimum amount of high canopy cover forest when logging spotted owl habitat and there are no limits on the size of trees to be logged in the majority of the area to be treated.

The DEIS suggests that Alternatives B and D allow treatments that could "include substantial reductions in canopy cover (down to possibly 30 percent average cover in some patches) and removal of some large trees, temporary local declines in owl and fisher abundance may occur" (DEIS, p. 376). However, the species is already suffering from loss of abundance in all areas managed by the Forest Service under Alternative A and there is no evidence that the losses in abundance that are highly likely to occur under Alternative B would be "temporary" because "Timber production is anticipated to continue after desired conditions have been achieved" (SNF Draft Plan, p. 153). Given that Alternatives B and D will likely exacerbate the Forest Service-wide decline and there is no evidence that such declines will be either small or temporary, we have significant concern that species viability will not be maintained under Alternatives A, B, or D.

[24] The Forest Plans include designating "Focus Landscapes." The spatial location and the size of the Focus Landscapes have not been defined in any forest plan-related materials. Focus Landscapes target spotted owl habitat, can be designated anywhere on the landscape, and allow logging 1/3 of each spotted owl PAC every 10 years.

10. Recommendations

In order to maintain species viability, the Forest Service should adopt the interim recommendations on spotted owl management (USDA Forest Service 2015a) proposed in Alternative C. In addition to the interim recommendations, the forest plan should provide for an increase in the pace and scale of surface and ladder fuels treatments in habitat designated for spotted owl conservation, as described in interim recommendations on spotted owl management (USDA Forest Service 2015a). Mechanical and hand thinning treatments in designated spotted owl habitat should target trees less than 16 inches dbh, except in cases when trees up to 20 inches dbh constitute a ladder-fuel hazard. Hand thinning and mechanical treatments should primarily be used in strategic locations to facilitate the use of fire as a treatment method at a broader scale, except in cases where fire is not feasible. When prescribed fire or fire managed for resource benefits is used to reduce surface and ladder fuels in spotted owl territories, including PACs, acceptable fire effects should include mixed severity fire effects that are consistent with NRV.

E. Pacific Fisher

Pacific fisher is a forest carnivore closely associated with closed canopy, late-successional forests. Due in part to past logging, the fisher's distribution in the Sierra Nevada has been reduced to a small, isolated population in the southern Sierra Nevada. The high degree of threat and risk to persistence for the population in the southern Sierra Nevada led the Forest Service to commission a conservation assessment (Spencer et al. 2015) and strategy (Spencer et al. 2016) for fishers. Prepared by fisher scientists and other experts, the strategy recommends conservation measures to reduce the threats and stressors on fisher and to increase the numbers and distribution of fishers in this part of its range. To varying degrees, recommendations from the strategy were incorporated into the draft plans or alternatives, but in no case was the entire strategy incorporated into an alternative.

Forest carnivore expert Dr. Reginald Barrett reviewed the draft plans and DEIS. He concluded that the revised plans will substantially increase risks to the fisher and its habitat, further threatening the fisher's viability in the southern Sierra Nevada (Barrett 2016, Exhibit IV.2). Furthermore, according to Dr. Barrett, there is no new information that would warrant weakening existing forest plan protection for this species (Barrett 2016); to the contrary, new information supports strengthening protection for the fisher and its habitat.

1. The Draft Plans and Alternatives Fail to Include Essential Aspects of the Fisher Conservation Strategy

Essential aspects of the fisher conservation strategy are omitted from either the draft plans and alternatives.

a. The draft plans and alternatives do not establish the number of fisher cells that need to be in suitable condition.

The fisher strategy was developed to respond to the threats of land management and fire on this very small population. A key element of the strategy was to select the number of "fisher target cells" to support a stable population now and to increase the population over time:

> The Strategy's biological goal of maintaining or increasing fisher population size and distribution requires that (1) the amount of suitable home range habitat be relatively stable or increasing, and (2) currently unoccupied but suitable habitat becomes occupied in the future. (Spencer et al. 2016, p. 41).

In the strategy, habitat condition, as defined by the habitat model, is used as a proxy for assessing population increase overtime. Regional monitoring is used to verify increases in fisher distribution and density that would signal potential increases in the population.

Neither the draft plans nor alternatives establish the number of "fisher target cells" for which habitat conditions must be met today or the number of target cells to be achieved in the future. The number of target cells to be achieved today should be included in a standards and the number of fisher target cells to achieve in the future should be included as an objective. Furthermore, the monitoring program should be revised to include the following questions:

> Has the number of fisher target cells in suitable condition established in the objectives been achieved?
>
> Has the distribution and density of fishers increased?

The above are two critical plan components combined with other plan content that are necessary to reflect the fundamental design of the fisher strategy.

To reflect the basic design of the fisher strategy, we ask that you set a target number of cells to be maintained in suitable conditions today (pre and post treatment condition) as the number that are currently in suitable condition, i.e., maintain a stable number, and set the number to be achieved in the future to be comparable to the values reflected in the strategy for fisher cores 1 through 5 (Spencer et al. 2016, p. 43).

b. The tree diameter limits in the fisher strategy were not included in the draft forest plans.

An abundance of large trees with cavities and decadence have consistently been identified as essential habitat components for denning and resting (Purcell et al. 2009, Naney et al. 2012). Recruitment of large trees is a process that takes a long time. "Large live trees are among the most slowly-renewing elements of the forest and are 'dominant' elements … in forest communities. It may take hundreds of years for conifers and hardwoods to develop the size and the decadence necessary to be used by fishers for resting." (Zielinski et al. 2006). In addition,

research has indicated that denning and resting habitat, not foraging and travel habitat, appears to be the limiting factor for fisher.

> Fishers have at least one daily resting bout and often use a different resting structure for each occasion. Resting locations protect forest mustelids from unfavorable weather and predators, thus choosing a resting site may be one of the most important choices made outside the breeding season. Previous work indicates that fishers and American martens … are most selective about choosing natal den and resting sites, and the least selective about foraging locations. This suggests that resting and denning sites may be the most limiting habitat element across the species' range. (Zielinski et al. 2004, emphasis added, citations omitted).

Moreover, "re-use of rest sites is relatively low …, indicating that habitats providing suitable resting structures need to be widely distributed throughout home ranges of fishers … and spatially interconnected with foraging habitats." (USDI Fish and Wildlife Service 2004, p. 18774). These findings and others led to the conclusion in the science synthesis for the Sierra Nevada that:

> Thus, any management actions or disturbance factors (e.g., logging of large-diameter trees, high-severity fire) that further reduce the abundance of large conifers (>76 cm [30 in] dbh), particularly ponderosa pines, sugar pines and white fir, as well as black oaks, will negatively affect fishers (Zielinski 2014, p. 411).

The fisher conservation strategy addresses the need to protect rest and den structures by evaluating the range of diameter limits for rest structures and selecting a diameter threshold for protection based on the upper three quartiles (i.e., the largest 75%) of trees and snags used by denning or resting fishers (Spencer et al. 2016, p. 58). From this analysis the fisher strategy recommends "mechanical treatments should retain conifer trees and snags >30 in dbh, including pines >27 in dbh." (*Id*.)

The draft forest plans adopt a 30 inch diameter limit and then waive this in areas, i.e., community buffers and focus landscapes, where the majority of treatments are likely to occur (e.g., Sierra draft plan, p. 91). The draft plans also allow the removal of tress greater than 30 inches when using group section. These exceptions to the diameter limit allow logging the large trees that are required by fishers denning and resting and recognized to be in low abundance on the landscape. And, as discussed elsewhere in these comments and identified by Dr. Barrett, the removal of large trees is not necessary to reduce fire risk and threat to fishers (Barrett 2016).

c. The habitat requirements in the fisher strategy are not adopted in the draft forest plans.

The amount of mature forest with dense canopy cover is one of the conditions required to support a suitable fisher target cell. The fisher strategy presented desired conditions in target cells where managing for fisher conservation is the objective. Satisfaction of this condition and other attributes is how a target cell qualifies as suitable now and in the future. To maintain suitability, such conditions must be met immediately after mechanical treatment. The draft forest

plans include a desired condition for the amount of CWHR type in a target cell that is consistent with the conservation strategy. However, in several others ways, the draft plans do not incorporate key aspects of the conservation strategy.

First, the draft plans exempt the desired condition for habitat type from community buffers and focus landscapes. As noted elsewhere in these comments, most protection measures for species like fisher that are associated with dense forests are waived or substantially weakened in the community buffers and focus landscapes. The DEIS estimates that most logging projects would occur in these management areas and therefore, most logging is likely to result in conditions that are not consistent with those that would maintain suitable post-treatment conditions for a fisher target cell. Compounding this is the issue that there is no requirement to meet the desired conditions for terrestrial systems stated in the draft plan immediately post-treatment. This means that post-treatment conditions could be even more degraded or departed from those required by fishers and still be consistent with the forest plan.

Second, the draft plans fail to include as plan components several important characteristics of suitable target cells, including:

Tree canopy cover:

- At the home range scale, >50% of a target cell supports tree canopy cover >70% (as measured by EVEG), with dense stands patchily distributed in mosaic with patches of more open (<40% cover) and moderate (40-69%) canopy forest to provide habitat heterogeneity.
- At finer scales, dense canopy stands are punctuated by small gaps (~0.1-2.0 ac each with an overall average of ~0.25 ac) to increase forest structural diversity (Knapp et al. 2012, Lydersen et al. 2013, Safford 2013).

Basal area

- Within each fisher target cell, basal area of mixed-conifer forest averages ≥150 ft^2/ac, ranging from ~100 ft^2/ac to >400 ft^2/ac at finer scales, depending on site conditions.
- Basal area of black oaks increases where site conditions allow. Black oaks are well-distributed within mixed-conifer and conifer-hardwood stands and are growing and reproducing vigorously (Spencer et al. 2016, p. 49).

Inclusion of these characteristics is important since they are among the suite of attributes that define the female home ranges that provide the science foundation of the fisher strategy.

d. The disturbance thresholds in the draft forest plans are not consistent with those in the fisher conservation strategy.

The disturbance thresholds in the fisher conservation strategy are dependent on meeting the retention guidelines in the strategy and designing a project to "maximize fisher habitat benefits" (Spencer et al. 2016, p. 57). Although the numerical values of the disturbance thresholds applied

in the draft forest plans are similar to those recommended in the fisher strategy, the draft plans do not require that habitat retention guidelines be met or that the project maximizes benefits to fisher, as required by the strategy. Thus, the level of disturbance could far exceed that anticipated by the fisher strategy. Given that the degree of habitat alteration allowed in the draft plans that no longer include canopy retention requirements or large trees retention requirements, the allowable logging on most of the landscape is more intensive than anything seen since the early 1990s.

The level of disturbance allowed by the draft plans is of even greater concern since the foundational research on which the fisher strategy was, in part, based, evaluates extent and intensity of treatments on fishers. The treatments evaluated were ones implemented between 200 and 2011 and would have followed canopy and tree retention guidelines that are not included in the draft forest plans. This means that the disturbance thresholds in the draft forest plans will be used to allow logging treatments that are more intensive than those contemplated in the underlying research.

The draft forest plans are not consistent with the fisher conservation strategy and additional best available science information. These inconsistencies increase the risk of extirpation and decline in population numbers in the short and long term.

2. The draft plans do not provide the ecological conditions necessary to support a viable population of fishers in the plan area.

Based on his review of recent demographic information about fishers in the southern Sierra Nevada, Dr. Barrett found that "the lower adult female survival rates apparent in the Southern Sierra Nevada could result in substantially lower population numbers in the future." This precarious status of fishers is "probably not viable over the long term in the absence of efforts to improve habitat quality within the existing range and to expand the range, especially to the North" (Barrett 2016). The actions allowed by the draft forest plans allow the degradation of suitable and highly suitable habitat and don't provide the ecological conditions in the short term that are needed to at least maintain the existing small population, let alone increase the population.

As described above and in the fisher conservation strategy, the essential ecological conditions required to maintain viable populations of fisher include high levels of dense, mature forest in their home ranges and around rest and den sites and an abundance of large live trees and snags. The draft plan specifically targets these conditions for logging. With respect to the effect of the plan on large trees, Dr. Barrett found:

> This means that a significant portion of the core habitat for fishers has no standards or guidelines to direct the retention of large trees – the very types of trees in low abundance across the landscape and required for resting and denning by fishers (Purcell et al. 2009). Diameter limits on the harvest of large trees have been instituted in the Sierra Nevada since 1992 to protect these uncommon elements (Barrett 2016).

Further, he found that the claims for the need to remove such trees are not based on science information, finding that:

> The DEIS makes claims that removal of trees greater than 30 inches in diameter is necessary to improve fire resiliency (DEIS, p. 364), yet these are baseless since it is commonly recognized that the removal of smaller trees (12 inches to 16 inches in diameter) is sufficient to address fuels concerns (North et al. 2009, Collins et al. 2011). I took a fire ecology course from Professor Harold Biswell in 1967 in which he made it clear that the larger the tree the lower the likelihood it would succumb to fire; I believe this relationship still holds true (Barrett 2016).

Thus, removal of large trees is a threat to persistence and not needed to reduce the threat of habitat loss from fire.

The draft forest plans also propose desired conditions that would affect a significant portion of fisher habitat that are not consistent with the habitat conditions in the fisher conservation strategy. Dr. Barrett found that:

> The draft plans include desired conditions for a "dry forest type" that are so dissimilar from habitat conditions in occupied female home ranges that if logged to the reported tree densities and canopy covers (e.g., Sierra draft plan, p. 19) the area would be unlikely to provide habitat conditions to support denning females. For instance, desired conditions for "Ponderosa pine-Dry Mixed Conifer" for tree density are "mostly < 150" square feet basal area per acre and median canopy cover is 30%. In contrast, home range conditions in the fisher conservation strategy recommend "≥150 ft^2/ac, ranging from ~100 ft^2/ac to >400 ft^2/ac at finer scales, depending on site conditions" and at "the home range scale, >50% of a target cell supports tree canopy cover >70% (as measured by EVEG), with dense stands patchily distributed in mosaic with patches of more open (<40% cover) and moderate (40-69%) canopy forest to provide habitat heterogeneity" (Spencer et al. 2016, p. 49) (Barrett 2016).

Although the DEIS provides no analysis of the area covered by this "dry forest type," a comparison of maps in the draft plans indicated that "there is extensive overlap of large areas that presently provide suitable habitat for fishers that would likely be rendered unsuitable given the direction in the draft plans" (*Id*.)

Dense canopy cover is a key attribute for fisher rest and den sites and a dominant feature of fisher home ranges. Dr. Barrett found that:

> Despite its importance, the draft plans provide only one guideline for the retention of dense, multi-storied canopy conditions… This guideline is vague and not specific with as little as 1-2% of a treatment area qualifying as "some." The draft plans provide desired conditions for some forest types, e.g., "moist Mixed Conifer" (SNF draft plan, p. 19) that come closer to habitat conditions used by fishers, but there are no requirements to meet these desired conditions when designing projects (*Id*.).

The draft plans include as a plan component a management area referred to as a "focus landscape." These areas are purported to improve conditions for fisher at some future time, but

they promote the extensive and intensive logging in the short term. Additionally, the presence of fishers is among the criteria for selecting a focus landscape, thereby increasing the likelihood that fishers will be affected. Dr. Barrett found that:

> In the focus landscapes, elements of the draft plans designed to provide "protection" for fisher (even if limited in benefit) are waived to allow logging and other management actions to occur without restriction (e.g., Sierra draft plan, p. 92 and 100). There is no limit on how many focus landscapes might be designated or little limit on their size. Thus, the minimal protections provided in the draft plans are waived in areas that are likely to be the focus of intensive alteration and degradation of habitat that is suitable and potentially occupied by fisher. And by design (i.e., the criteria used to select them), the focus landscapes are likely to be concentrated in areas with significant amounts of suitable fisher habitat. Lastly, the draft plans "estimate" that twice the area would be treated compared to the existing forest plans. Given the stated intent to focus treatments in landscapes used by fisher and containing suitable habitat, the adverse impact to fisher is likely to be much greater for the draft plans compared to the existing forest plans (*Id*.).

Based on his review of the draft plans, Dr. Barrett found that "The draft plans would not provide for the ecological conditions necessary to maintain viable populations of Pacific fishers on the Sierra and Sequoia national forests. Given the fisher's imperiled status in the southern Sierra, the loss of even a few individuals could contribute to a trend toward extinction." (*Id.*)

3. The analysis of effects of the draft plans to fisher does not comply with NEPA.

The DEIS fails to take a hard look at the plan's likely adverse impacts on the fisher and its habitat as required by NEPA. As detailed below, the DEIS makes unwarranted assumptions, sweeps important issues under the rug, and is not based upon the best available research. As a result, the DEIS does not fully inform the public or decision makers of the likely environmental consequences of the draft plans.

Most fundamentally, the DEIS fails to acknowledge that logging pursuant to the standards and guidelines in the draft plans will degrade fisher denning and resting habitat, and fails to analyze the likely consequences of such degradation on the fisher. As demonstrated above, the standards and guidelines for the draft plans allow intensive logging of fisher habitat, unlimited removal of large trees, and reduction in canopy cover to unrestricted levels, all of which will degrade habitat conditions or render it unsuitable.

As noted in our comments on California spotted owls and martens, information presented in the DEIS indicates that the data exists to complete a spatially explicit analysis of the impacts of the alternatives on habitat conditions necessary to maintain viable populations of fisher. For example, the maps in Figure 33 (DEIS, p. 180) show existing habitat conditions along with modeled desired conditions. This information could be used to estimate how many fisher target cells would no longer be considered suitable if logged to achieve the modeled desired conditions. Fire modeling like that completed for the Sierra Nevada Adaptive Management Project (Fry et al. 2015) could be used to assess the differences between alternatives with respect to fire outcomes, and what is driving differences in effect, e.g., the extent of the treatment or the

intensity of the treatment. And there are other assessment tools tht could be used to quantitatively measure the risk of mechanical or other treatment versus benefits to increasing resiliency, but none of this is addressed in the DEIS, contrary to the requirements of NEPA.

4. Recommendations

We recommend that the agency adopt in the final forest plans the fisher conservation strategy (Spencer et al. 2016) without exceptions.

F. Sierra Marten

"The marten is among the most habitat-specific mammals in North America, and changes in the quality, quantity and distribution of available habitat could affect their distributional range in California (Buskirk and Powell 1994)" (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4., p. 23). In the Sierra Nevada, "martens prefer coniferous forest habitat with large diameter trees and snags, large down logs, moderate-to-high canopy closure, and an interspersion of riparian areas and meadows" (USDA Forest Service 2001a, Volume 3, Chapter 3, part 4.4, p. 19).

1. Current Logging Practices are a Threat to Marten

The DEIS (p. 330-331) provides a brief account of status and threats for this species. The evaluation of threats refers specifically to "past timber harvest" as a threat and does not address current and ongoing threats from timber harvest. This is inconsistent with the best available science information. In a synthesis of science information, Zielinski (2014, p. 406) found that "given the current rarity of clearcutting on public lands in California, the largest potential direct threat from human activities is the effect of forest thinning." The response by martens to thinning in other forested bioregions suggests that

> [M]artens would associate with the densest residual areas in thinned units and may also increase their home ranges, which may lead to decreased population density. The negative effects of thinning probably result from reducing overhead cover. Thinnings from below, which retain overstory cover, probably have the least impact on marten habitat, provided they retain sufficient ground cover. Downed woody debris provides important foraging habitat for martens. Andruskiw et al. (2008) found that physical complexity on or near the forest floor, which is typically provided by coarse woody debris, is directly related to predation success for martens; when this complexity is reduced by timber harvest (a combination of clearcut and selection harvests with subsequent site preparation in their study area), predation success declines. (*Id.*)

Additional information is now available on marten response to fuel treatments. Moriarty and Epps (2016) found for a study area in the Sierra Nevada that "Martens selected home ranges with fewer openings compared to the study area overall. Within home ranges, martens strongly selected complex stands over simple stands and openings." These and other findings led them to conclude that "martens avoided stands with simplified structure, and the altered patterns of movement we observed in those stands suggested that such treatments may negatively affect the

ability of martens to forage without increased risk of predation. Fuel treatments that simplify stand structure negatively affected marten movements and habitat connectivity." Thus, forest thinning practices today have been clearly identified as a threat to marten persistence.

The degree of this threat is ameliorated, at this point, by the degree to which thinning occurs in those upper elevation habitats that are less departed from desired conditions. Zielinski (2104, p. 406) found "it would appear that there is less impetus for land managers to thin canopies and reduce surface fuels—both actions that potentially reduce habitat quality for martens—in true fir forests than in the mixed-conifer forests at lower elevations." The DEIS, however, contemplates increasing the pace of scale of thinning or "restoration" at higher elevation to address climate change and the consequences of warming trends. Thus, the DEIS should identify ongoing logging, including thinning, group selection and any other practices allowed by draft plans, as a threat to this species. Furthermore, plan components to reduce these threats should be included in the revised plans, and a quantitative analysis to evaluate the impacts of the treatments allowed by the plans should be included in the DEIS.

2. The Draft Plans Do Not Provide the Ecological Conditions Required to Maintain Marten's Viability.

As is the case for most at-risk species, the draft plans rely on desired conditions with little additional direction to provide the ecological conditions to maintain marten viability. Since thinning, group selection and other logging allowed by the draft plans are likely to result in simplification of habitat that is detrimental to marten persistence, the draft plans should include additional plan components to address this threat and improve the clarity of plan components that are identified.

a. Marten Core Habitat Areas are Not Sufficiently Defined

The draft plans include an area called "marten core habitat area" or "marten habitat core area," but these areas are not clearly defined. The spatial location of these areas is not included on a map nor are their locations clearly described in a manner that could be located on a map. The draft plans simply define in the glossary these areas as:

> **Marten habitat core areas** are large contiguous areas of marten habitat within which martens can establish home ranges and comingle as a population (Sierra draft plan, p. 168).

This entry includes a footnote to:

> Spencer, W. and H. Rustigian-Romsos. 2012. Decision-Support Maps and Recommendations for Conserving Rare Carnivores in the Interior Mountains of California. Unpublished report produced by Conservation Biology Institute

We are familiar with the habitat modeling completed in this report, but it is unclear to us if this definition in the glossary means to utilize the "cores" identified in Figure 4 of this report to define the "marten habitat core areas" mentioned in the draft plans. We support defining core

areas as means to direct management for this species and support the application of Spencer and Rustigian-Romsos (2012) for this purpose and ask that you clarify the application.

Use of the "cores" from Spencer and Rustigian-Romsos (2012) also requires an understanding of the habitat conditions that drove these occupancy models. These are conditions that reflect the "use" of the areas by marten and should be the basis of desired habitat conditions for marten.

b. Direction Within the Marten Core Habitat Area

Having established a "core" area in order to manage marten habitat, it is essential that additional plan components be designed to guide management in these areas. The draft plans presently include three desired conditions and one guideline that refer to these areas for marten more generally:

> **SPEC-CSO-PF-SM-DC**
> 01 Risk of large high intensity fire is reduced, especially in fisher linkage areas (Figure 9), fisher target habitat (Figure 10), California spotted owl protected activity centers and home range core areas, and marten core habitat areas.
>
> 02 Within the fisher strategy area (Figure 9), spotted owl home range core areas, and marten core habitat areas, vegetation is trending toward desired conditions for terrestrial and riparian vegetation.
>
> **SPEC-SM-DC**
> 01 Sierra marten habitat is well distributed throughout the marten's range, providing for foraging, denning and resting habitat, and movement across large landscapes.
>
> **SPEC-CSO-PF-SM-GDL**
> 01 Within the California spotted owl home range core areas, fisher strategy areas and marten core habitat areas, retain some overtopping and multi-storied canopy conditions, including some shade-tolerant understory trees such as firs and cedars, especially in drainages, swales and canyon bottoms and on north and east-facing slopes. Retain a patchy mosaic of shrubs and understory vegetation, separated by more open areas, to reduce fuel continuity, increase habitat heterogeneity, support prey and provide hiding cover, with a goal of 10 to 20 percent shrub cover at the home range scale.

These components provide little guidance about the actions that would be appropriate in the core habitat for marten. The general desired condition for marten (SPEC-SM-DC 01) does not offer a specific definition for foraging, denning or resting habitat and provides little guidance for developing a project that may affect marten or its habitat. As a whole, these plan components provide no clear protections for forests with dense canopy, abundant large trees and large snags, and abundant down wood that are required for marten persistence. Such direction is needed because the logging, i.e., group selection, thinning and other practices, that is allowed can degrade or render habitat unsuitable for denning, resting and foraging required by the species.

Guidance about acceptable actions is necessary since the red fir and lodgepole pine types used by marten are largely within desired conditions for seral stage and other characteristics (Terrestrial Vegetation Ecology Supplemental Report, p. 24-25). Any projects to improve fire resilience should then be focused on removing surface and ladder fuels and making little change to dense canopy conditions.

There are two "potential management approaches" that have some promise as guidelines:

> Maintain or increase understory heterogeneity in marten denning habitat to promote "hiding cover" such as shrub patches, coarse woody debris, and slash piles following vegetation treatments. Design projects to have non-linear edges.
>
> Avoid or remediate habitat modifications that unnaturally increase marten susceptibility to predation (Sierra NF draft plan, p. 87)

However, in order to meaningfully direct project planning, these must be converted into guidelines and define habitat modification that would increase marten susceptibility to predation. We also note that the DEIS refers to "focus landscapes" as having a nexus with the management of Sierra marten:

> Emphasize vegetation treatments in focus landscapes (10,000 to 80,000 acres in size) to move terrestrial ecosystems toward desired conditions and increase resilience of old forest habitat, while limiting impacts to California spotted owl, Pacific fisher and Sierra marten (DEIS, p. 384).

This is not consistent with the definition of a focus landscape in the glossary that identifies only Pacific fisher and California spotted owls as the target species. Inclusion of Sierra marten makes no sense in a focus landscape since fire regime conditions in its habitat area are not highly departed.

3. The Impacts from Actions Allowed by the Draft Plans on Marten Habitat and Persistence are not Evaluated in the DEIS

As with other species dependent upon dense forest conditions, the effects analysis for Sierra marten is qualitative and does little to actually estimate effects of the allowable activities on habitat quality and quantity. At best, the DEIS (see for example p. 382) discusses where logging might occur, but does not evaluate the potential for practices like thinning and group selection to degrade habitat or cause it to become unsuitable.

4. Recommendations

The inclusion of the "marten core habitat area" in the draft plans is a step in the right direction. This management area needs to be accompanied by plan components that direct planning in this area. In our scoping comments, we provided standards we think appropriate to apply to this management area. They include:

- Limiting disturbance during denning using a limited operating period
- Retaining habitat conditions that support denning
- Limiting vegetation management to reducing surface and ladder fuels to reduce fire risk
- Restoration treatments retain all large trees

G. Sierra Nevada and Nelson Bighorn Sheep

Sierra Nevada bighorn sheep is a federally listed animal occurring on the Inyo National Forest. We appreciate that the draft plan for the Inyo mentions this species, but instead of simply referencing the Recovery Plan in a guideline (SPEC-SHP-GDL 01) the relevant actions from the recovery plan should be listed as objectives, guidelines and standards. This is an issue we raised in our scoping comments and is something we believe is necessary to ensure the Forest Service is contributing to the recovery of the species and sustaining it in the future. The population is currently increasing and is projected to be at recovery levels during the life of the plan. The inclusion of specific management direction in the plan can be used to support any future delisting process.

Delisting for this species will depend on the elimination of all potential sources of contact with domestic sheep and goats. To facilitate this, we ask that SPEC-SHP-STD 01 be revised to state "Eliminate livestock use in areas known to be potential sources of disease for Bighorn Sheep."

For *O. c. sierrae*, the risk of disease contact is a particular concern in some locations. In addition to the Mattley/Conway grazing allotments under Mono County there is the "petting zoo" at the entrance to McGee Creek that has sheep and goats, and there are (or have been in the past) hobby domestic sheep at De La Cour Ranch on Horseshoe Meadow Road. Research on the necessary buffer zone between domestic animals and bighorn sheep varies from a few miles to 10-12 miles. We recommend contacting the bighorn sheep species experts at CDFW for maps showing the necessary buffer zones for some of these locations. The plan should include as a goal the expectation that a partnership will be established with other local and federal agencies to implement and enforce buffer zones.

We do not find that the draft plan does enough to address the potential for conflict between domestic sheep and goats and Nelson bighorn sheep. As with Sierra Nevada bighorn sheep, we ask that you include a goal to develop a partnership with local landowners and other agencies to implement and enforce barriers and buffers to prevent the comingling of this species with domestic sheep and goats.

The following are three additional items that should be revised in the DEIS:

Table 83 (p. 351)
Add the following to the "principal habitats" entry for Sierra Nevada bighorn sheep: "Forages on shrubs located near or on these cliff faces and within meadow systems. Requires visually open areas with suitable escape terrain (rock cliff faces)."

The Recovery Plan citation in Appendix G is incorrect. The date should be 2007.

The desert bighorn recovery plan draft (2013) should also be referenced as it is the best available science information on *O. c. nelsonii*.

H. Mule Deer

The existing forest plans for the Sierra and Sequoia national forests include measures to protect regional deer herds.[25] These measures were developed in consultation with the Department of Fish and Wildlife when the plan was adopted in 1991. The standards tier to the deer management plans for the herds within the boundary of the national forest. Management direction for key or special habitat identified in these herd management plans is included in the existing forest plans. Conflicts identified between deer and forest management activities included competition for forage with domestic livestock, disturbance of deer and deer fawning areas by road traffic and off-highway vehicles, and changes or disturbances caused by timber management activities to travel corridors utilized by deer. The Sierra forest plan includes standards and guidelines to reduce conflicts, such as:

> 44. Minimize, during July, management activity, such as logging and vehicular traffic, in deer population centers 2, 3, 4, 5, 7, 10, 12, 14, 15, 16, 22, 24 and 29. (See Wildlife Element Map)
>
> 45. Minimize management activity in deer holding areas 2, 3, 4, 6 and 10-18 during the following periods (See Wildlife Element Map):
>
> a. Holding areas above 5,000 feet elevation – May 15 to June 15 and October 1 to November 30.
>
> b. Holding areas below 5,000 feet elevation - May 1 to June 1 and October 15 to November 30.
>
> 46. Keep vehicle travel at low levels in deer winter ranges 2, 5, 6 and 7 from December 1 through April (See Wildlife Element Map)
>
> 47. In key wildlife areas, regulate road use through seasonal or permanent closures. Do not close roads needed for permanent public use. (See Wildlife Element Map)
>
> 48. In key deer areas, reduce disturbance from normal traffic by leaving a screen of vegetation immediately adjacent to maintenance Level III**,** IV and **V** roads, where feasible and practical. Where screening does not exist or when existing screening cannot be protected during routine management activities, carryout subsequent management in a manner that will not impede the development of adequate screening
>
> 51. Use the management plans for the North Kings, San Joaquin, Huntington, Oakhurst and Yosemite deer herds as deer habitat management guides
>
> (USDA Forest Service 1991, p. 4-15).

[25] The Inyo forest plan may also include management direction for deer herds, but we were not able to verify this since the web link to the 1988 Inyo forest plan was not functioning.

The population trends for the last six years of deer in these forests are mixed including declining, stable, and increasing numbers for deer herds that overlap with the plan areas in zones D-7, D-8, D-9, X9a, X9b, X10 and X12.[26]

The draft plans should include standards to manage deer herds consistent with these commitments in the past. The DEIS should also evaluate the impact of not having standards on the health of the deer herds and the effect this could have on hunting, widlife viewing and other recreational pursuits.

I. California Condor

There is no mention of the federally endangered California condor nor species-specific plan components included in any of the three draft forest plans. This is a significant oversight considering the species' known occurrence and increasingly frequent use of the Sequoia and Sierra national forests over the past few years.

The U.S. Fish and Wildlife Service Condor Recovery Program actively tracks individual condors via satellite and cellular transmitters and has documented continued and expanded use of the southern Sierra Nevada, including increased frequency of roosting and flyovers around Lake Isabella, up to Highway 180 east of Fresno and as far north as the Bass Lake area (personal communication S. Kirkland, USFWS 2016). Data from tracked condor locations, depicted by blue dots in the maps below, are accessible on the ScienceBase-Catalog website (USGS 2016).

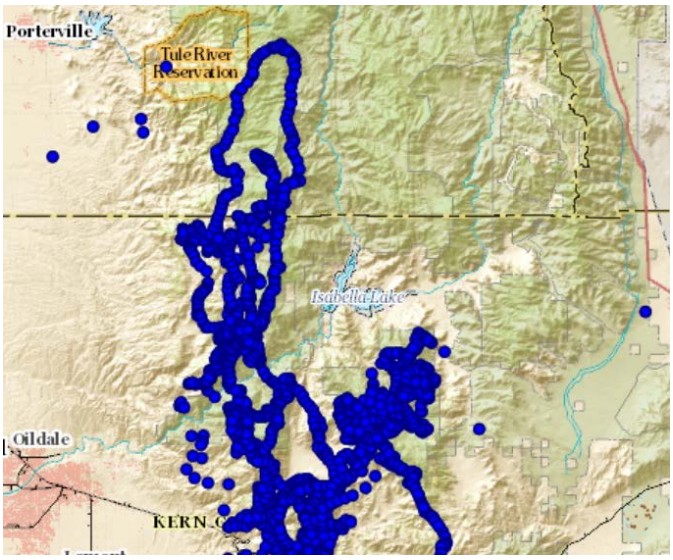

Figure 9. Condor transmitter data, September-December 2014 (USGS 2016).

[26] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=116669&inline; https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=116670&inline

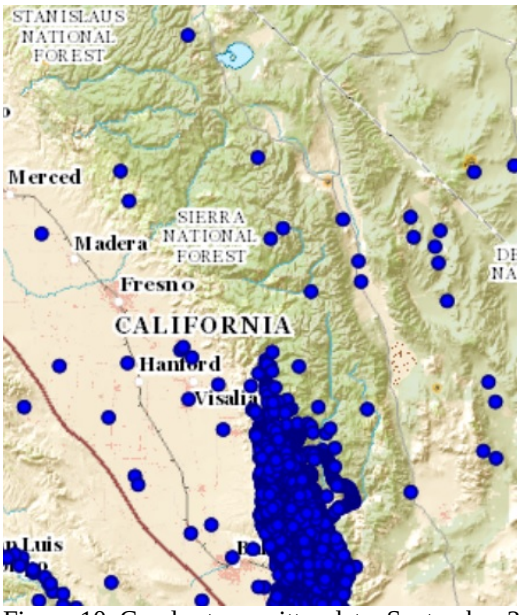

Figure 10. Condor transmitter data, September 2015 (USGS 2016).

Figure 11. Condor transmitter data, January-March 2016 (USGS 2016).

The DEIS includes a single mention of condors with regards to their use of large trees and snags in old forest conditions, and a brief species account for condors. The species account highlights a 2010 personal communication with USFWS condor recovery personnel who "estimated that it would be at least 5 years before condors explore Sequoia National Forest with sufficient frequency to establish a reproductive territory" (DEIS at 324). Considering that estimate, condors

could have been exploring the Sequoia National Forest in search of nesting territory for the past year or more. Given the 10-15 year lifespan of these forest plan revisions, which could easily surpass 20 years, the Sequoia, Sierra and Inyo national forests should anticipate condors actively utilizing the planning area for foraging, roosting and nesting within the life of these new forest plans.

We strongly encourage the Forest Service to include condor-specific plan components in the final forest plans. The Los Padres National Forest hosts the largest population of free-flying condors anywhere in the world. The FEIS for the four southern California national forest plan revisions, which included the Los Padres, recognized a variety of threats to condors, including ingestion of garbage (also referred to as microtrash), communication and utility facilities, harassment at cliffs, lead bullets, target shooting and unauthorized shooting, i.e., wildlife poaching (USDA Forest Service 2005). The final Los Padres forest plan also included specific standards that addressed such threats to at-risk species, including:

> S28: Avoid or minimize disturbance to breeding and roosting California condors by prohibiting or restricting management activities and human uses within 1.5 miles of active California condor nest sites and within 0.5 miles of active roosts. Refer to California condor species account (or subsequent species guidance document; see Appendix H) for additional guidance.
>
> S42: Include provisions for raptor safety when issuing permits for new power lines and communication sites (see guidelines in Appendix G). Also implement these guidelines for existing permits within one year in identified high-use flyways of the California condor, and within five years in other high-use raptor flyways. Coordinate with California Department of Fish and Game, U.S. Fish & Wildlife Service, and power agencies to identify the high-use flyways.
>
> Appendix G- Guidelines for Protection and Conservation of Bird Species at Mountain Top Communications Sites, USDA Forest Service
>
> The four southern California national forests are comprised of the Angeles, Cleveland, Los Padres and San Bernardino National Forests. A major program administered by these national forests is the issuance and administration of special-use authorizations for communication facilities at designated communication sites. The following guidelines have been developed and adopted by the four southern California national forests as a supplement to Communications Site Plans, for the protection and conservation of bird species covered by the Migratory Bird Treaty Act and/or Endangered Species Act of 1973, as amended.
>
> I: Guidelines for Communication Tower Siting, Construction, Operation, Maintenance and Decommissioning
>
> New towers shall be the same or lesser tower height as existing towers at the site and no more than 199 feet above ground level (AGL), and shall not require guy wires.

Towers shall be unlighted if Federal Aviation Administration (FAA) regulations permit. If towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided.

Any existing tower using guy wires shall have daytime visual markers on the wires to prevent collisions by diurnally moving species. Spacing of markers should be at 10-foot intervals for smaller 'tags' and at 20-foot intervals for larger more linear 'flight diverter' structures.

In order to reduce the number of towers needed in the future, providers shall design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for multiple users.

Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.

Towers, facilities and structures no longer in use or determined to be obsolete should be removed.

Road access to mountain top communication sites must be adequate to support construction, maintenance and demolition of facilities. Communication service providers responsible for construction activities must notify the Forest Service prior to removal of equipment and structures to assess access needs.

II: Additional Guidelines for Other Structures Associated with Communication Towers and Sites

Place anti-perching materials along the top of open horizontal surfaces at tower tops or protruding arms of other tall vertical structures.

Place anti-perching materials or devices along the top edge of flat rooftops or roof ridges of equipment buildings or other similar structures located within the communication site.

Cover all microwave dishes with radome covers and place anti-perching materials or devices along the top quarter-arch of the front edge of dishes capable of supporting a perching condor (approximately 20 pounds per bird).

Place anti-perching materials or devices along the top surface of horizontal coverings or tracks holding wave-guides capable of supporting a condor.

Keep all trash, garbage or excess scrap materials removed from the communication site, or placed in enclosed structures not accessible to condors or other large bird species.

> Secure all loose wires or netting to prevent accidental entrapment of large birds. Placement of wires in conduit is also recommended where feasible.
>
> Cover or otherwise protect external fiberglass type insulation or other soft materials which could be ripped apart or ingested by condors or other large birds.
>
> Cover all spill retention or catchment basins or other open structures that may collect and hold water or other liquids, which condors or other birds may attempt to drink.
>
> Cover or screen all large drains, conduits or other similar openings, which are large enough for a condor to walk into to prevent potential entrapment.
>
> All doors and windows on buildings or other structures shall be designed to ensure they remain closed when not occupied by personnel to prevent accidental entry and entrapment of condors or other species.
>
> Cyclone type fencing or other similar security fencing or walls surrounding equipment or other structures should be designed and located to avoid the potential for accidental entrapment of condors or eagles.
>
> Place raptor guards or other anti-perching materials or devices along the upper surface of the horizontal cross arms of electrical power poles at communication facilities, which could serve as perches for larger birds.
>
> Fuel storage tanks associated with generators and other facilities shall meet current fire department, federal, state, and local safety and hazardous materials requirements. Fuel storage shall be consolidated into one tank large enough to accommodate all tenants in a facility.
>
> (For guidance on markers and other anti-perching devices, see Avian Power Line Interaction Committee (APLIC). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute, Washington, D.C., 78 pp, and Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines. Edison Electric Institute/Raptor Research Foundation, Washington, D.C., 128 pp. Copies can be obtained via the Internet at http://www.eei.org/resources/pubcat/enviro, or by calling 1-800-334-5453).

The Giant Sequoia National Monument Management Plan (GSNM; USDA Forest Service 2012) also includes strategies for contributing to the recovery of condors, including management of condor habitat following the most current US Fish and Wildlife Service California Condor Recovery Plan; protecting roosting and potential nesting sites; and managing historical condor use areas. The GSNM plan also acknowledges that giant sequoias are the only known trees large enough to provide nesting cavities for the California condor, noting that the last pair of condors breeding in the wild was discovered in a giant sequoia that is part of the monument.The giant sequoia ecosystem – both inside the monument and fragments thereof on the Sequoia and Sierra national forests – remains available for the return and study of condors.

Even the existing Sequoia National Forest plan from 1988 recognized the need to modify management of condor roost sites to "minimize possible conflict with the recovery needs of the condor" and that "[a]dditional areas may be set aside as critical needs are perceived in accordance with the Condor Recovery Plan and in cooperation with the USDI Fish and Wildlife Service" (at 3-29). At very minimum, the existing Sequoia forest plan includes management direction to follow the recovery and management plans for condors among other special status species. Nothing similar is found anywhere in the latest draft Sequoia forest plan.

Litigation over Forest Service logging of Giant Sequoia groves and public outcry over the previous Sequoia National Forest plan dramatically changed how the Forest Service managed the Giant Sequoia ecosystem. The Mediated Settlement Agreement for the Sequoia National Forest (July 1990) also includes a variety of safeguards for California condors and their habitat. It is not clear how the draft Sequoia Forest Plan is consistent with this agreement. The Sequoia National Forest should look to the Mediated Settlement Agreement (pp59-64) and include the following in the revised Sequoia forest plan:

- **Suitability criteria for evaluating nesting sites**, including designating as potential condor nesting sites all previously inventoried and any newly discovered Giant Sequoia trees with cavities identified as suitable for us by condors;

- **Management of potential nesting habitat**, including a prohibition on mechanical timber harvest and construction of new permanent roads and trails within 0.5 mile of a potential condor nesting site; in consultation with the Condor Recovery Team, preparation and implementation of a road and trail closure plan when condors are capable of nesting within the planning area; establish and enforce seasonal road and trail closures for logging activities and recreational uses within 0.5 mile of potential nesting sites from January 1 through June 30 each year, which may be lifted after April 30 each year if the Sequoia National Forest in consultation with the Condor Recovery Team has completed field observations, after April 15, and has concluded that condors are not actively nesting in the affected potential nesting area; if condors are found to be nesting in the area, roads and trails within 1.5 miles of the nesting sites should be closed for the balance of that calendar year; and determine if additional campgrounds, road, or other public uses may remain open if additional potential nest sites are discovered;

- **Management of active nesting habitat**, including no drafting of perennial or intermittent streams upstream or within 1.5 miles of an active nesting site as a source of water for dust abatement, prescribed burning, broadcast burning, or any other purpose in which a nest is active; and

- **Management of roosting habitat**, including designating identified roost sites as Wildlife Habitat Management Areas and implementing a road and trails closure plan when condors are released and closing all roads and trails within 0.5 mile of known roost sites to all public use.

Lastly, the Forest Monitoring Plan should include monitoring known and potential condors nest and roosting sites to determine occupancy.

J. Willow Flycatcher

The dense riparian foliage that willow flycatcher depend on to reproduce and escape nest predation is threatened by permissive range management proposed in the Sierra, Sequoia and Inyo National Forest management plans. Sadly, there is not even an attempt in the proposed plans to identify and restore willow flycatcher habitat that has been degraded, as urged by wildlife biologists from the Forest Service, the California Department of Fish and Wildlife, and non-profit organizations in Loffland et al. (2014). We find that the proposed forest plans do not provide for diversity because the habitat conditions required by willow flycatcher are not provided, and surprisingly no species-targeted plan components have been developed. We find this contrary to the planning rule's requirement that forest plans provide for the ecological conditions necessary to maintain a viable population of each species of conservation concern in the plan area.

1. Overview of Willow Flycatcher's Status and Habitat Associations in the Sierra Nevada

Willow flycatchers breed in montane meadows and riparian areas in the Sierra Nevada. They require dense, tall riparian shrubs (five to six feet) with standing water through mid-June for successful nesting (Green et al. 2003, Vormwald et al. 2011; Mathews et al. 2012; Loffland et al. 2014). These habitat elements are threatened by both natural and human-related activity.

The willow flycatcher is a state endangered species (since 1991) and is highly vulnerable to extirpation in the Sierra Nevada. In just the past 13 years, 33% of breeding sites have disappeared between 2000-2013 (Loffland et al. 2014, p. 10). The recent decline has been sharpest in the Southern extent of their range. There are now 0-5 sites estimated to support willow flycatcher breeding in the Southern Sierra, from Alpine to Tulare Counties (Loffland et al. 2014, p. 12). On the Sierra National Forest, breeding willow flycatchers *(E.t. brewserii*) have only been detected at two meadows since 2000 (*Ibid*, p. 11). On the Inyo N.F., no breeding sites have been detected since 2010 (*Id.*, p. 12). On the Sequoia N.F., the Southwestern willow flycatcher (*E.t. extimus*) has also diminished to less than 10 breeding territories in 2014 (*Id*., p. 12). Mathewson et al. (2012) reported that over half of all *E.t.brewsterii* breeding sites disappeared between 1997-2008 in central and northern Sierra Nevada breeding sites. While there are still meadows in the Southern Sierra with recent willow flycatcher detections, overall, the population appears to be contracting northwards at a rate of 0.06 degrees latitude per year (Loffland et al. 2014, p. 10).

Key research by Mathewson et al. (2012) has confirmed that large, wet meadows (>173 acres) (p. 25) with dense and tall willow cover are critical to willow flycatcher nest survival and fecundity (p. 21 and p. 22-23). Flycatchers depend on these three habitat features to escape nest predation, which is the most frequent cause of lower nest survival in several Sierra Nevada studies (Cocimano et al. 2011). After over a decade of demographic research on willow

flycatchers in the Sierra Nevada, Mathewson et al. (2012) pin-pointed what land managers must address to ensure viability for willow flycatchers:

> Loss and degradation of montane meadows, specifically the riparian shrub community, is the primary factor contributing to population declines of flycatchers in our study regions. Dispersal dynamics indicated that suitable breeding habitat, characterized by dense riparian shrubs, be available across the landscape for persistence of populations. (p.25).

Management intervention is needed to restore hydrologic function to many meadows, and to protect high functioning meadows in order to sustain willow flycatchers in the Sierra Nevada. Gully formation, meadow desiccation, dewatering of meadows, and lodgepole incursion on meadows are all linked to nest predation of willow flycatcher nests (Green et al. 2003). Mathewson et al. (2012) underscores the importance of meadow restoration for willow flycatcher persistence in the Sierra Nevada:

> Reversing population declines or maintaining population stability of flycatchers… depends on active restoration of hydrological processes to montane meadows. (p. 25).

Further, Mathewson et al. (2012) recommend restoration to address climate change impacts to willow flycatcher:

> Improving conditions of riparian habitat may offset the limitations imposed by shortened breeding seasons at higher elevations and buffer against natural stochasticity in the environment (p. 26).

Clearly, species-targeted habitat restoration is needed to provide ecological conditions necessary to support willow flycatcher in the southern Sierra Nevada in the face of climate change that is accelerating meadow drying especially in degraded systems.

2. The Proposed Plans Fail to Provide Components Necessary to Ensure Willow Flycatcher Persistence in the Southern Sierra Nevada

a. Desired Conditions Lack Specificity to Ensure Required Ecological Conditions Are Met

The planning rule requires that forest plans create ecological conditions to maintain viable populations of species of conservation concern. And, fine-filter provisions are intended to provide a safety net for those species whose specific habitat needs or other influences on their life requirements may not be fully met under the coarse-filter provisions. (Federal Register vol. 77, no. 68, pp. 21174-5).

The desired conditions for the Sierra, Inyo and Sequoia National Forests do not adequately describe reproductive habitat for willow flycatcher and there are no standards or guidelines to ensure that the necessary conditions will be provided. For example, according to Green et al. (2003) and Loffland et al. (2014) willow flycatchers require the following for reproduction:

- 20-30% riparian deciduous shrub cover,
- 40% meadow cover by water,
- 2-4 m high riparian deciduous shrubs, and
- 525 m^2 average shrub area.

With the 'RCA-MEAD' desired conditions, it is possible to both eliminate willow flycatcher habitat and meet the DEIS desired conditions to have a diversity of habitat types and species, because the habitat conditions willow flycatchers need to survive are not quantitatively described as they are above and in the literature. Thus, the Forest Service's obligation under 36 CFR 219.9 a & b will not be met. For example, RCA-MEAD-DC 07 mentions healthy stands of willow, and alder, but even this desired condition lacks specificity to ensure habitat characteristics required by willow flycatcher are identified and managed for.

Desired conditions must be described in terms specific enough to allow progress toward their achievement (Sierra draft plan, p. 7); that is, plan components must be described in terms specific enough to provide the ecological conditions necessary for willow flycatcher. The willow flycatcher has very specific habitat requirements, as described by Loffland et al. (2014): "…although many bird species are associated with meadows, no other Sierra bird species is so exclusively dependent on both saturated meadow conditions and an extensive shrub component." (p. 1).

The following desired conditions are presented in the DEIS (Table 83, p. 350) as "*plan components for habitat integrity, sustainability and or species persistence*" of willow flycatcher*;* however, these desired conditions are so broadly general that they pertain to many species and none at the same time. Willow flycatcher is never mentioned in any plan components, nor are the ecological conditions upon which the species depends, namely saturated meadow conditions and extensive riparian shrubs levels described above, even though these are the very plan components presented to address the species habitat requirements. More troubling, no standards or guidelines have been identified in Table 83 that would provide for "*habitat integrity, sustainability and or species persistence."*

- TERR-FW-DC 03 Ecological conditions contribute to the recovery of threatened and endangered species, conserve proposed and candidate species and support the persistence of species of conservation concern.

The TERR-FW-DC 03, above, is identical to MA-RCA-DC 15, below, and is also a direct quote from the 2012 planning rule about NFMA's diversity requirement (219.9(b)), it is not an actual plan component, it's just a definition. Desired conditions must be described in terms specific enough to allow progress toward their achievement, this desired condition does not meet this requirement because it lacks any specificity.

- SPEC-FW-DC 01 Sustainable populations of native plant and animal species are supported by healthy ecosystems, essential ecological processes and land stewardship activities, and reflect the diversity, quantity, quality and capability of natural habitats on the forest. These ecosystems are also resilient to uncharacteristic fire, climate change, and

other stressors in order to support the long-term sustainability of plant and animal communities.

- SPEC-FW-DC 02 Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the plan area. Ecological conditions provide habitat conditions that: contribute to the survival, recovery and delisting of species under the Endangered Species Act; preclude the need for listing new species; improve conditions for species of conservation concern; and sustain both common and uncommon native species.
- SPEC-FW-DC 03 The structure and function of the vegetation, aquatic and riparian system, and associated microclimate and smaller scale elements (e.g., special features such as carbonate rock outcrops, or fens) exist in adequate quantities within the capability of the plan area to provide habitat and refugia for at-risk species with restricted distributions.
- RANG-FW-DC 02 Domestic livestock grazing maintains the desired vegetation represented by diverse plant functional groups, species richness and diversity, and structure and condition of plant communities.
- RANG-FW-DC 03 Forage, browse, and cover meet the needs of wildlife and authorized livestock are managed in balance with available forage. Areas that are grazed have or are trending toward having satisfactory soils, functional hydrology and biotic integrity.
- MA-RCA-DC 02 Species composition and structural diversity of plant and animal communities in riparian areas, wetlands, and meadows provide desired habitat conditions and ecological functions.
- MA-RCA-DC 03 The distribution and health of biotic communities in special aquatic habitats perpetuates their unique functions and biological diversity.
- MA-RCA-DC 04 Spatial and temporal connectivity for riparian and aquatic-dependent species and nutrient cycling is maintained within and between watersheds. Connectivity provides physically, chemically and biologically unobstructed movement for species survival, migration and reproduction.
- MA-RCA-DC 05 The connections of floodplains, channels, and water tables distribute flood flows and sustain diverse habitats.
- MA-RCA-DC 11 Native riparian vegetation is diverse, structurally complex and provides food and cover to sustain fish and wildlife populations.
- MA-RCA-DC 15 Ecological conditions contribute to the recovery of threatened and endangered species, conserve proposed and candidate species, and support the persistence of species of conservation concern.
- RCA-RIV-DC 02 Stream ecosystems, including ephemeral watercourses, exhibit full connectivity where feasible to maintain aquatic species diversity, except where barriers are maintained in good condition to protect native aquatic species. Ephemeral watercourses provide for dispersal, access to new habitats, and perpetuation of genetic diversity, as well as nesting and foraging for riparian and aquatic species.

b. There are No Plan Components to Address Threats Identified in Plans

The Southern Sierra Forest Plan DEIS describes threats to willow flycatcher including: *"destruction of shrub vegetation resulting in loss of nesting sites, and cover for predator avoidance"* (DEIS, p. 332). However, there are no plan components that protect nests, potential

nest substrate, or vegetative cover for nests. Rather, several plan components in the following sections would allow further degradation of nesting habitat. There is known nesting as recently as 2008 (although it is not clear from the BE if surveys have occurred after this date, so we are unclear if absence has been confirmed anywhere since this date) and documented suitable habitat in the Dinkey Creek, Poison Meadow, Patterson Mountain, and Markwood allotments, to name a few. The DEIS reasons that species-targeted planning should be dropped from the proposed plans because it had been determined that none of the willow flycatcher sites on the three national forests occurs in an active livestock allotment DEIS, p. 332). However, current evidence of breeding in cattle allotments is not needed for NFMA requirements to apply. Willow flycatchers, as well as recently and historically occupied habitat, still occur in the plan area (and grazing allotments) today. Regardless of breeding status in allotments, the Forest Service must develop species-targeted plan components, including meadow habitat management guidelines and restoration plans, in order for the species to persist in the plan area. Again, see Loffland et al. (2014) for specific recommendations and scientists' optimism about species persistence in the plan area with the help of active management in specific locations that achieve specific habitat targets.

The biological evaluation (BE) for the three forest plans identifies an incomplete list of threats to willow flycatcher including: "destruction of shrub vegetation resulting in loss of nesting sites and cover for predator avoidance, increased predator access to meadow interior, loss of foraging substrate and decreased insect abundance, and potentially increased contact with brown-headed cowbirds" (DEIS, p. 332). However, grazing is never mentioned as a threat. Past evaluations by the US Forest Service in Region 5 recognize that grazing has contributed to the degradation of wet montane meadows used by willow flycatcher (USFS 2004 FSEIS, p. 291), and "Past and recent land management, primarily grazing, has likely reduced habitat capability of otherwise suitable meadows by reducing or eliminating the willow or woody shrub component and changing meadow hydrology" (USFS 2004 FSEIS, p. 291).

The BE for the 2016 early adopter forest plan revisions is cursory, and does not recognize basic information known about willow flycatcher. Threats identified in the last plan revisions are unrecognized in the draft plans without explanation. New information has not been presented to suggest that grazing should no longer be considered a threat. To the contrary, monitoring reveals willow flycatcher populations continue to decline and meadow habitat condition has not improved in many range allotments. As a result of not accurately identifying threats, plan components are not focused to address known threats to willow flycatcher, and then habitat condition trends cannot be corrected to provide for the species persistence in the plan areas, as required by NFMA. In other words, there is no hope of reviving the willow flycatcher without acknowledging how destructive livestock grazing is to maintaining dense willows and wet meadow conditions.

Cattle grazing is particularly destructive to willow flycatcher habitat. Grazing and browsing removes willow cover (Green et al. 2003). Cows trample, tunnel in, and rub against willow shrubs, browse on terminal growth leaders preventing willows from escaping browse height, and, cows reduce overall riparian shrub foliage density, thus degrading meadow habitat value for willow flycatchers (King 1955; Taylor 1986; Valentine et al. 1988). Removal of cattle has been shown to increase flycatcher populations in Oregon (Taylor and Littlefield 1986). Cattle browse

at the same height that willow flycatchers nest, 5-6 feet above the ground, where shrub foliage density has been shown essential to nest success (Green et al. 2003, Cocimano et al. 2011), as well as population stability (Mathewson et al. 2012). There are no plan components developed to protect the very habitat components directly linked to willow flycatcher nest survival, fecundity and population stability. By proposing the same or less restriction on grazing in meadows within the range of the willow flycatcher, the draft plans fail to ensure that the breeding habitat conditions required by one of the most imperiled species occur in the plan areas.

The proposed plan components do not protect willow flycatcher nests in active allotments. As we mentioned earlier, the DEIS claims that there are no active allotments in occupied willow flycatcher territories, however vacant allotments can be opened at any time, so this distinction is meaningless. If willow flycatcher nesting occurs at any time in the future, a nesting attempt would be unprotected from management activities under proposed plans. Recent willow flycatcher breeding was reported in Summit Creek, Quail Hollow meadow, in the Dinkey allotment, as well as Grade meadow, Markwood meadow and Summit meadow in the Markwood allotment, and Poison meadow and Lost meadow on private land (Sierra NF, 1996). Long Meadow in the Patterson Mountain allotment and the Markwood meadow complex are highest priority for restoration because of their capability to support a population of willow flycatcher if it is restored (Loffland et al. 2014). Markwood meadow was proposed for cattle exclusion in 1996 to protect willow flycatcher nests, but it is unclear why fencing would not still be a part of the management strategy proposed in the forest plan, or current allotment management plan. If willow flycatcher nests occur in active allotments in the future, there are no plan components to protect willow flycatcher in this scenario, and nests would be at risk of trampling.

There have been a number of willow flycatcher detections on the SNF (16) as recently as 2008 (last survey 2010), INF (32) as recently as 2007 (last survey 2010), and SQF (13) currently (since 2010) (Loffland et al. 2014). Grazing allotments such as Dinkey Creek and Markwood, which were recently documented with occupied territories (last 15 years) do not adopt any willow flycatcher habitat restoration or protection measures, contrary to strong recommendations by leading biologists (including FS biologists) in Loffland et al. (2014). Therefore, the forest plans must maintain or enhance willow flycatcher habitat in order to recruit more breeding territories to address viability (Mathewson et al. 2012, Loffland et al. 2014). Willow flycatcher occurrence in the southern Sierra is documented, and dispersal from larger meta-populations is assumed possible by researchers, therefore the Forest Service has a responsibility to provide planning direction to ensure that habitat for this species is adequately provided through protection and restoration measures.

c. Standards and Guidelines are Inadequate to Provide and Protect Willow Flycatcher Breeding Habitat Integrity

The following are plan components presented in Table 83 of the DEIS (p. 350) as *"plan components for habitat integrity, sustainability and or species persistence,"* however they do not meet that purpose, because they do not identify specific habitat needs required by breeding willow flycatcher. The proposed plan components listed in Table 83, some of which are listed below, do not ensure habitat conditions required by at-risk species are provided, as required by NFMA 219.9(b).

First, RANG-FW-STD 01 (SNF p. 93) *"To protect hardwood regeneration in grazing allotments, allow livestock browsing on no more than 20% of annual terminal leader growth of aspen seedlings and advanced regeneration, and no more than 20% of annual growth of willows. Modify grazing plans if hardwood regeneration and recruitment needs are not being met."* These hardwood regeneration and recruitment needs are undefined making implementation of this standard impossible. In order to address species of conservation concern, as required by the planning rule, the Forest Service should add, based on recommendations in Loffland et al. (2014): *"…if willow flycatcher habitat conditions are not being provided… ensure 20-30% riparian deciduous shrub cover, 40% meadow cover by water, and 2-4 m high riparian deciduous shrubs, in meadows with historic or current occupancy status, and all meadows over 50 acres."*

Second, MA-RCA-STD 17*"Limit browsing to no more than 20 percent of the annual leader growth of mature riparian shrubs and no more than 20 percent of individual seedlings. Remove livestock from any area of an allotment when browsing indicates a change in livestock preference from grazing herbaceous vegetation to browsing woody riparian vegetation."* Although this standard is more specific and less aspirational than some, it too misses the mark for ensuring ecological conditions for species of conservation concern. Browse on woody vegetation is a low bar to manage rangelands and in no way addresses viability of willow flycatcher. The Forest Service must develop meadow and riparian vegetation thresholds that address habitat needs for species of conservation concern like willow flycatcher rather than just avoiding the worst-case scenario for rangeland management.

Third, MA-RCA-GDL-08 states *"Under intensive grazing systems where meadows are receiving a period of rest (e.g., rest- rotation and deferred rotation), utilization levels can be higher than the levels described above if the meadow is maintained in late seral status and meadow-associated species are not being impacted."* Again, this guideline does not protect specific habitat needs of willow flycatcher as described above. Because it is possible to meet this guideline and still not provide willow flycatcher breeding habitat, this guideline does not ensure willow flycatcher persistence in the plan area, as it was presented.

The MA-RCA-GOAL (SNF p.64-65) restoration priority (p.65) doesn't mention urgent restoration needs of willow catcher meadow restoration. *"Recommend restoration practices in: (1) areas with compaction….etc."* It should read*:"… in Long Meadow and Markwood Meadow*

on the SNF, and Rush Creek and Lee Vining Creek on the INF" as recommended by Loffland et al. 2014).

The RCA-MEAD-OBJ 01 *"Take action to maintain or restore structure, composition, or function of habitat for fisheries and other aquatic species along 20 stream miles over a 10 year period"* (draft Sierra plan, p. 78). The agency should add: *"prioritize recently occupied willow flycatcher and currently occupied great gray owls meadows* and *in Long Meadow and Markwood Meadow on the SNF, and Rush Creek and Lee Vining Creek on the INF"* (per Loffland et al. 2014) as high priority for restoration.

Lastly, the MA-CAR-DC (p. 65) and MA-RCA-OBJ (p. 78) don't mention desired conditions for willow flycatcher even though by definition a CAR includes species of conservation concern: *"CARs are…known to contain either known locations of SAR, 2) highly vulnerable populations of native plan or animals species; or 3) are localized populations of rate native aquatic or riparian dependent plant or animal species"* (DEIS, p. 65). But desired conditions for CARs don't address specific ecological conditions needed by willow flycatcher such as restoration of dense riparian shrub nesting habitat that are protected from cattle, nor the urgent restoration priority of large meadows such as Markwood Meadow, Dinkey Meadow, Lost Meadow and Long Meadow on the Sierra NF; and Rush Creek, and Lee Vining Canyon on the Inyo NF (Loffland et al. 2014). The draft plan components do not ensure adequate ecological conditions required for willow flycatcher reproduction, thus species persistence in the plan area is not provided for, contrary to NFMA.

3. The Plans Fail to Champion Habitat Restoration Called for to Ensure Willow Flycatcher Persistence in the Plan Areas

Under the current forest plan direction, we have seen a 33% decline in Sierra Nevada willow flycatcher breeding sites in last 13 years, and a 50% decline in the last 30 years (Loffland et al. 2014, p. 10 and p. 1). Willow flycatcher are worse off now than during the last round of forest plan revisions in 2004, and more is known now about their habitat requirements. Despite this, the Forest Service proposes no species-targeted management direction in the proposed forest plans. By comparison, current forest plan direction provides specific plan components for willow flycatcher surveys, and before that the 2001 forest plan amendments also gave range management direction that protected flycatchers in occupied habitat, and protected key habitat elements in meadows with recent flycatcher detections. Now more than ever the Forest Service must provide species-targeted direction to protect and restore willow flycatcher in the proposed plans, including setting clear habitat restoration goals, survey priorities and habitat protection measures.

The Watershed Condition Framework[27] presented at the beginning of all three forest plans is used to identify priority watersheds for restoration (Sierra draft plan, p. 9). However under the 2012 planning rule, the Forest Service is required to weigh species of conservation concern when setting watershed restoration priorities, but the framework used to set restoration priorities does not acknowledge species of conservation concern. The watershed condition framework lists 12

[27] http://www.fs.fed.us/biology/resources/pubs/watershed/maps/Watershed_Condition_Framework2011FS977.pdf

watershed condition indicators to be used for assessing watershed condition and need for restoration. These 12 indicators include aquatic biota and riparian vegetation, but not species of conservation concern or riparian biota, thus excluding willow flycatcher and other SCC. Indeed, the planning rule itself was not published yet when this framework was published. In addition, 40 CFR 1502.22 requirements regarding "incomplete or unavailable information" have not been met since the assessment has not provided required information, because that information is "essential to a reasoned choice among alternatives."

There are other details about this restoration prioritization framework that raise concerns. First, the map of priority watersheds indicates that there are more watersheds on the Westside of the southern Sierra Nevada at risk than there are functioning. This indicates that changes in management and active restoration are needed across the planning area with greater emphasis than is given in the draft plans. Second, the Forest Supervisor is not necessarily in a position to incorporate best available science for all species of conservation concern at the level of detail needed during watershed restoration prioritization process. This analysis should occur at the regional level to ensure best available science is incorporated and that there is a similar process for each forest. Third, proposed meadow restoration under draft plans does not recognize or prioritize urgent needs for protecting and restoring willow flycatcher breeding habitat as recommended in Loffland et al. (2014). According to recent research co-authored by the Forest Service Region 5, managers should *"Create re-colonization opportunities by restoring currently occupied meadows or three largest previously occupied meadows"* (*Id*., p. 21). Authors then identify highest restoration priority for the Sierra NF: Markwood Meadow, Dinkey Meadow, Lost Meadow and Long Meadow (*Id*., p. 19); highest restoration priority for the Inyo NF (including brown-headed cowbird control prior to habitat enhancement) in the vicinity of Rush Creek and Lee Vining Canyon (*Id.*, p. 20). Yet, these areas are not prioritized for restoration in the proposed plans. In addition, according to the same 2014 publication, all meadows larger than 50 acres should be managed to restore habitat and/or modify grazing management that increases proportion of meadow with surface water (40% meadow cover by water) during entire breeding season (6/1-8/31), increase riparian shrub cover (20% of meadow cover), and shrub height (2-4 meters) (*Id.*, p. 24). Willow flycatcher restoration priorities must be central to watershed restoration priorities on all three National Forests in order to ensure the viability of this imperiled species in the face of declining population, range contraction, and extirpation of multi-territory breeding sites in the southern Sierra Nevada. There are still birds dispersing from nearby populations, and the Forest Service should make the meadows mentioned above the highest priority for habitat restoration to provide breeding habitat for dispersing individuals throughout the plan areas.

4. Interagency Agreements

Plan components should provide direction regarding an agreement between Los Angeles Department of Water and Power (LADWP) and Lee Vining, Rush Creek, and Mono Lake on INF. The WTR-FW-GDL 01 says "*Cooperate with federal, tribal, state and local governments to secure in-stream flows needed to maintain, recover, and restore riparian resources, channel conditions, and aquatic habitat during all basic Federal Energy Regulatory Commission (FERC), state and other authorized water use planning, water rights, and relicensing on the national forests. Coordinate relicensing projects with the appropriate state and federal agencies.*

Provide written and timely license conditions to the Federal Energy Regulatory Commission." It is important to clearly and specifically identify the purpose of agreements for each forest in the planning process. For example on the Inyo NF, tributaries to Mono Lake, Lee Vining and Rush Creeks support key habitat for willow flycatcher. Protecting and monitoring populations of willow flycatcher near Mono Lake is essential because the species here display monotypic habitat selection (McCreedy and Heath 2004; Green et al. 2003). Here, willow flycatcher nest in tall riparian shrubs atypically located away from meadows. This population may represent a gene-pool displaying persistence in environmentally extreme conditions that could favor survival in changing climate (McCreedy and Heath 2004).

Protecting Lee Vining and Rush Creeks from environmental degradation also supports higher lake levels that protect the second largest California gull rookery in the world, located on Mono Lake's islands. Higher lake levels also support stable lake conditions for the endemic Mono brine shrimp, the primary food source for breeding gulls and other water birds. Interagency agreements are part of how the Forest Service is required through NFMA to provide ecological conditions necessary for willow flycatcher persistence.

5. Documentation and Use of Best Available Science Information

The DEIS incorrectly suggests that the willow flycatcher population decline in the Sierra Nevada is outside the authority of the Forest Service to address because "*recent population declines of E.t. brewsterii [were] observed in relatively pristine and seemingly unaffected habitats in Yosemite National Park."* (DEIS, p. 332) This statement is based on a single study, Siegel et al. (2008), where multi-territory sites in Yosemite were extirpated; however, in the published journal article, the authors actually conclude that *" direct effects of recent land-management practices have contributed substantially to the decline of the species across the Sierra Nevada"* (*Id*., p. 8). And, *"Most of the potential causes of the Willow Flycatcher decline discussed above suggest that improved management of the species' riparian and meadow breeding grounds throughout the Sierra Nevada could aid its recovery"* (*Id*, p. 15). Another hypothesis the researchers consider in this same publication is that meadow habitat within Yosemite NP is not extensive enough to sustain a willow flycatcher population, and that *"Yosemite's declines could be explained by habitat degradation outside the park, regardless of habitat condition within the park"* (*Id*.). This is not what is represented in the forest plan DEIS. The Forest Service misrepresents the science presented in this study.

Dr. R. Siegel, the same scientist misinterpreted in the DEIS as described above, published another manuscript in 2014 with detailed recommendations for land managers on the Sierra NF, Inyo NF and Sequoia NF responding to willow flycatcher population declines in the Southern Sierra. This publication was co-authored by a USFS biologist in Region 5. Here, authors, including the Forest Service as a partnering agency, urge restoration of willow flycatcher breeding habitat: *"…there is still hope that re-colonization could occur within some portions of the historic range of this species if they encounter restored areas during migration periods"* (Loffland et al. 2014, p. 17). *"…success of hydro-geomorphic restoration at attracting or retaining Willow Flycatchers at even a few restored sites suggests that the idea of creating large enough patches of habitat to support multiple flycatcher territories is not out of reach"* (*Id.*). Again, we are concerned that the Forest Service has a conflicting and incorrect interpretation of

key research on willow flycatcher in the DEIS, and that the agency is ignoring best available science and ignoring its responsibility to play a significant role in restoring willow flycatcher to the Southern Sierra at a critical time. Long-term ecological sustainability, at-risk species viability, and ecosystem restoration are pillars of the new planning rule. The agency must engage in active conservation on behalf of this imperiled species. This misrepresentation of science and dismissal of the agency's responsibility to aid at-risk species is in conflict with the 2012 planning rule as well as the best available science. The DEIS, BE, and draft plans should be corrected to include a restoration plan according to Siegel's recommendations (Loffland et al. 2014) with hydrology and habitat restoration planned in key large meadows aimed at correcting issues related to roads, trails and grazing; and plan components must be developed to protect wet meadows with standing water and dense, tall riparian shrubs in the three southern forests.

Another concern is that the DEIS, BE and proposed plan components for meadows and RCAs ignore very specific willow flycatcher reproductive habitat needs including (Green et al. 2003, Loffland et al. 2014):

- 20-30% riparian deciduous shrub cover,
- 40% meadow cover by water,
- 2-4 m high riparian deciduous shrubs, and
- 525 m^2 average shrub area.

Proposed plan documents do not quantify habitat needs or habitat suitability thresholds for willow flycatcher including meadow shrub density, cover, and height used for nesting even though they are known from the literature. The Forest Service should incorporate quantitative, specific information about the habitat needs of at risk species when it exists in the literature.

6. The DEIS Does Not Adequately Disclose Negative Impact of Grazing in Suitable Habitat on Willow Flycatcher

The BE describes some threats to willow flycatcher including: destruction of shrub vegetation resulting in loss of nesting sites and cover for predator avoidance, (3) increased predator access to meadow interior, (4) loss of foraging substrate and decreased insect abundance, and (5) potentially increased contact with brown-headed cowbirds (DEIS, p. 332). However, grazing is never mentioned.

There is a cascade of negative effects from grazing on willow flycatcher habitat documented in the literature (Green et al. 2003). Cattle browse, trample and rub on willows at the same height willow flycatcher nest (USFS 1996, Green et al. 2003, Sierra NF 2006). Riparian foliage density and willow cover are linked to nest success (Green et al. 2003). The Dinkey Creek Allotment EIS describes concerns with cattle grazing on the Sierra NF in willow flycatcher habitat (USDA Forest Service 1996):

> …deterioration of quality habitat and individual nests has occurred. (p. 3-36).

> Discontinued cattle grazing would allow for the improved suitable nesting and foraging habitat for the willow flycatcher. It would eliminate the possibility of nest destruction by cattle… (p. 4-31).

Yet, the potential negative impacts of cattle grazing in willow flycatcher habitat is not mentioned in the forest plan BE or DEIS, therefore the decision maker and the public are not adequately informed, as required under the NEPA.

The Forest Service must analyze effects of all three proposed plans on willow flycatcher habitat, even if the birds are not there, in order to satisfy NEPA hard look standards. We found the Sierra NF pack stock EIS from 2006 online, which describes the extent of willow flycatcher habitat on the Sierra NF that is lacking in the DEIS:

> Currently on the SNF, there are 2,205 sites consisting of 10,725 acres that are identified as WIFL habitat. Out of these, there are:(1) 13 sites consisting of 371 acres identified as "occupied" habitat, (2) 141 sites consisting of 4,334 acres identified as "emphasis" habitat, and (3) 709 sites consisting of 3,515 acres identified as "suitable" habitat (calculated from the 2001 SNF GIS WIFL layer). The remaining acres may be in one of the categories, however, they have not been ground verified. Comparison of past (1990 -1994) and current (1999-2001) high & moderate WIFL habitat acreages reveal that habitat trend on the SNF is significantly declining (USDA 2006). Calculations made to arrive at this trend status are not presented in the document, however, because the document referenced (USDA 2006) is still in draft and habitat acreages are currently not finalized. Nevertheless, the trend status determination is considered an accurate reflection of habitat decline on the SNF (SNF 2006, p. 3-396).

From this 2006 document, we deduced that the proposed Sierra NF plan impacts over 10,000 acres of willow flycatcher habitat. These impacts must be described in detail in the DEIS in order to inform the decision maker and public. There is also the same issue with the extensive willow flycatcher habitat on the Inyo and Sequoia NFs, the extent of which are not disclosed in the DEIS, contrary to NEPA. Furthermore, the significant habitat decline mentioned above must be revisited and impacts of no proposed change to management should also be examined carefully according to NEPA.

Lastly, we note that the impacts of private inholdings on willow flycatcher were not examined in the impacts analysis, despite recommendations by Loffland et la. (2014) to restore Dinkey meadow on private land. This recommendation indicates the importance of this meadow to willow flycatcher in the plan area and impacts of current private management should be disclosed. Pack stock and saddle stock use also have the potential to impact willow flycatchers and their breeding habitat (Sierra NF 2006) and these impacts have not been disclosed, contrary to NEPA.

7. The DEIS Does Not Adequately Disclose Negative Impact of Failing to Restore Willow Flycatcher Habitat

The impacts of the lack of a restoration strategy focused on meadows prioritized for the US Forest Service in Loffland et al. (2014), such as:

- The Markwood meadow complex and Long meadow on the Sierra NF, and
- The vicinity of Rush Creek and Lee Vining Canyon on the Inyo NF, and
- For all meadows larger than 50 acres, restore habitat and/or modify grazing management that increases proportion of meadow with surface water (40% meadow cover by water) during entire breeding season (6/1-8/31), increase riparian shrub cover (20% of meadow cover), and shrub height (2-4 meters),

are not disclosed to either the decision maker or the public, contrary to NEPA.

The Forest Service is at a critical time regarding restoration of willow flycatcher habitat in the southern Sierra. Currently, there is still hope of returning the species to recently (or still) occupied sites because of their proximity to larger meta-populations, detections of single males in the area, meadow size, and potential for supporting suitable habitat (Loffland et al. 2014). The lack of a species-targeted restoration strategy in the draft plans is enormously significant for willow flycatcher populations in the region. The impacts of this lack of a coherent restoration strategy for willow flycatcher, despite clear management recommendations from leading scientists and an agency wildlife biologist, should be disclosed, as required by NEPA.

The willow flycatcher has undergone substantial declines recently, resulting in an estimated 50% reductions of the Sierra Nevada territories in the past 30 years (Loffland et al. 2014, p. 1) The great gray owl is also a meadow associated species, and has shown evidence of a recent population decline and isolation resulting a population bottleneck and low genetic diversity (Hull et al. 2010, 2012). Population monitoring and genetic research for these species suggest they are persisting under challenging conditions.

8. The DEIS Does Not Disclose Survey Results Used to Determine Willow Flycatcher Occupancy Status on the Sierra National Forest

The effects analysis for the proposed Sierra NF forest plan is based on the assumption that there is no overlap in grazing allotments and occupied willow flycatcher breeding sites (DEIS, p. 17). The assumption that there are no occupied willow flycatcher sites in active livestock allotments is presented as the basis for which a species-specific plan direction for willow flycatcher is not being carried forward into the proposed plan revision (*Id.*). However, the Forest Service has not disclosed the occupancy status of willow flycatcher breeding sites. An EIS online from 2006 reports 2-year protocol surveys were completed in 2005-2006 (Sierra NF 2006, table on p. 3-396). Since there was occupancy in 2006, another round of protocol surveys were due in 2010 (Sierra NF 2006, p. 3-398), however survey results were not reported in the DEIS.

The occupancy status of willow flycatcher on the Sierra NF that is omitted in the DEIS is summarized below from 2006:

> In 1998 all of the known willow flycatcher sites and some additional sites on Sierra NF were surveyed with no confirmed willow flycatcher detections. However, willow flycatchers may have gone undetected because only one visit was made to each site, except for Long Meadow. For example, in 1998, an unidentified species of *Empidonax* flycatcher was detected at Poison/Grade Meadow, which is a site where willow flycatchers have been found on several occasions in the past. The 1995 surveys consisted of two visits per site and covered more sites than the 1998 surveys; therefore, the 1995 survey results are considered to be a more realistic estimate of the current population. Using 1995 survey data, the estimated current willow flycatcher population is 6 to 9 individuals on the Sierra NF, and 4 to 6 individuals on private land. For all sites, Sierra N F and private land, there are estimated to be 10 to 15 individuals. (SNF 2006, p. 3-400)
>
> As part of the 2004 SNFPA ROD, meadows identified as "occupied" by willow flycatchers have been placed on a 4-year survey cycle. Current results from these surveys are listed in the tables above. The "occupied habitat" designation indicates a willow flycatcher was detected in a meadow during the breeding season at least once since 1982. The designation does not indicate that a pair of willow flycatchers successfully nested in the meadow, or that willow flycatchers currently occupy the habitat, only that a willow flycatcher song was heard during the designated survey period. Confirmation of a singing male during the key survey period indicates the possibility that the bird is a territorial breeding male, and therefore the possibility that a nesting pair of flycatchers could be present for that year (SNF 2006, p. 3-400).

There are no protocol survey results reported in the DEIS to indicate that the occupancy status has changed, so the agency must assume occupancy in meadows that have had willow flycatcher detections since 1982, according to the 2004 forest plan. In lieu of the indication that willow flycatcher presence on the Sierra NF is not precluded, species-specific plan direction should be part of the proposed action.

9. The DEIS Does Not Disclose Impacts to Willow Flycatcher from the Proposed Plan Components

The plan components presented in Table 83 of DEIS (p. 350) as *"plan components for habitat integrity, sustainability and or species persistence"* of willow flycatcher and other SCC, do not quantify willow flycatcher habitat needs or habitat suitability thresholds for including meadow shrub density, shrub cover, meadow vegetation height used by nesting birds. For example, RCA-MEAD-DCs doesn't mention nor ensure that plans will provide willow flycatcher habitat needs including: 20-30% riparian deciduous shrub cover, 40% meadow cover by water, 2-4 m high riparian deciduous shrubs, and 525 m^2 average shrub area (Green et al. 2003; Loffland et al. 2014). In a second example, RCA-MEAD-DC 07 mentions healthy stands of willow, alder, etc.

but this is too general because it's possible to eliminate dense willows that may be high quality willow flycatcher habitat, and still meet this desired condition to have a diversity of habitat types and species.

The adequacy of the proposed desired conditions that are purported to protect willow flycatcher habitat without ever mentioning willow flycatcher or their specific habitat needs should be evaluated in the DEIS. A quantitative evaluation should assess the likelihood of achieving the specific habitat conditions noted above, given the very generic and not appropriately specific plan components in the draft plans.

10. Biological Evaluation Relies on Actions in the Draft Plans that Are Not Assured

The BE determination for Alternative B, C and D is contingent upon: *"Implementation of restoration of meadows and in riparian areas will provide for an opportunity for willow flycatcher populations to expand back into historically occupied areas."* (BE, p. 11). However, there is no indication in the proposed plans that this will occur. The draft plans call for restoration of 10 meadows over 10 years, but the criteria being followed to prioritize meadow restoration (see above) does not prioritize SCC habitat. Therefore, it is entirely possible that critically important restoration in the Markwood meadow complex and Long meadow are not prioritized despite recommendations from Loffland et al. (2014).

Furthermore, the impacts of the proposed grazing in willow flycatcher breeding habitat, occupied or not, is not disclosed. A comparison of effects of among alternatives A, B, C, and D, where surveys are discontinued on the latter 3 alternatives is not disclosed. The Forest Service must carefully examine the situation for willow flycatcher in the Southern Sierra, including the loss of breeding populations and habitat declines. The impact of the plans on willow flycatcher should be viewed as part of the bigger picture this SCC faces with declining habitat that continues to be influenced by current grazing regimes in combination with climate change. The Forest Service has not yet examined impacts from the continuation of current grazing regimes in the absence of a willow flycatcher habitat management strategy, along with increased weather unpredictability and a massive drought that is drastically transforming the vegetation across this landscape. These will have detrimental effects to key aspects of willow flycatcher viability, including rates of meadow occupancy, the ability of the meadow to attract dispersing single males or females from nearby larger populations, and ultimately, the persistence of a southern Sierra willow flycatcher population. Loffland et al. (2014) respond to this complex and vulnerable situation with suggestions for new management direction regarding restoration and grazing management.

11. The DEIS Does Not Adequately Address Climate Change and Grazing on Meadow Habitat Integrity, or Species-At-Risk

The Forest Service must carefully examine the situation for willow flycatcher in the Southern Sierra including the loss of breeding populations and habitat declines reported in 2006 (see Sierra NF pack stock EIS 2006, p. 3-396 to 3-400) and elsewhere in the literature (Sanders and Flett 1986, Loffland et al. 2014). This is part of the bigger picture of flycatcher population and habitat declines, influenced by continuing grazing for the past 15 years and compounded by huge

climate change impacts to meadow conditions in the region. The cumulative impacts of the proposed continuation of current grazing regimes in the absence of a willow flycatcher habitat management strategy were not disclosed. These impacts along with the effects of increased weather unpredictability and drought on the expected rates of meadow occupancy by willow flycatcher, or the ability of meadows to attract dispersing single males or females from nearby larger populations, and the likelihood of persistence of a southern Sierra willow flycatcher population should be disclosed, as required by NEPA.

12. Recommendations

In order to address the imperiled status of willow flycatcher in the southern Sierra, we recommend the above changes to plan component language, in addition to the following:

Modify RCA_MEAD-OBJ 01 Take action to maintain, enhance, or improve conditions on 5 to 10 meadows of any size within 10 years following plan approval. (e.g., Sierra draft plan, p. 78). Change to: *"Take action to enhance or improve conditions on 5 to 10 meadows to address needs of willow flycatcher, great gray owl, Yosemite toad or mountain yellow-legged frog (possibly 2-3 meadows per species) within 10 years following plan approval.*"

Willow flycatcher researchers recommend restoring meadow habitat within 12km of recent detections in several specific locations on the SNF, INF and SQF. Restoration priority for willow flycatcher on the Sierra NF are Markwood, Dinkey, Lost, Long meadows; and Rush and Lee Vining Creeks on the Inyo NF. All meadows greater than 50 acres must receive a high priority on every forest, as well.

Limit human and livestock activity to meet targeted habitat conditions for willow flycatcher including 20% cover of riparian shrubs, and saturated soils. Re-establish deciduous shrub component in meadows. According to Forest Services consultants, Point Blue and Institute for Bird Populations, the highest restoration priority for meadow managers to benefit birds in Sierra Nevada, (Campos et al. 2014) is to "*restore floodplain function and ground water elevation, plant dense clumps of willow stakes, and reduce grazing pressure where livestock are high-lining existing willow cover or impacting regeneration"* (Campos et al. 2014, p.15). Plug and pond restoration has been successful in significant increases in bird species richness within 4-5 years (*Ibid*).

Conduct willow flycatcher surveys in suitable habitat every five years to determine status and habitat condition as described in the 2001 and 2004 plan revisions. If surveys detect willow flycatchers, livestock grazing will be prohibited in the meadow. If surveys did not detect willow flycatchers, late season grazing could occur, with utilization levels based on habitat condition. Additional willow flycatcher surveys will be conducted, and if needed, additional habitat protected to allow for the expansion of the population. (USDA Forest Service 2001a). Researchers recommendations are similar, i.e., continuing a coordinated survey effort with federal and state agencies (Loffland et al. 2014).

Prepare monitoring plans for areas supporting willow flycatcher and determine site-specific management actions that support willow flycatcher population and habitat recruitment per Loffland et al. 2014.

Keep new developments (packstock, gathering areas, recreation areas, etc.) that attract cowbirds and other nest predators, such as pack stations and campgrounds, away from riparian areas to minimize the impacts of the cowbirds on willow flycatchers.

K. Great Gray Owl

1. Overview of Great Gray Owl's Habitat Associations and Status in the Sierra Nevada

The great gray owl in the Sierra Nevada is genetically distinct and geographically isolated from other great gray owl populations, constituting a separate subspecies, *Strix nebulosa yosemitensis (*Hull 2014, p. 69). The majority of the population is centered around Yosemite National Park, Stanislaus NF and Sierra NF, in Tuolumne, Mariposa, Madera and Fresno counties (Wu et al. 2016, p. 72). There are six observations of Great Gray Owls recorded from Sequoia and Kings Canyon National Parks between 1965 and 2002 (*Id.*, p. 34). Adult owls have been documented in Inyo county (CNDDB 2016).

The great gray owl has been a California state endangered species since 1980. The entire population is estimated at 79 pairs (Wu et al. 2016, p. 21), making it highly vulnerable to extirpation, and likely suffering from a population bottleneck (Hull 2009). As a result, the risk to this subspecies from inbreeding, climate change, as well as from habitat loss due to timber harvest, grazing, and land use conversion is high (Hull 2009, Hull 2010, Jepsen 2011, Hull 2014, p. 71, Wu et al. 2016, p. 58, 63, 71, 79).

Great Gray Owls are closely associated with meadows and late-successional forests in the Sierra Nevada. They are dependent on old forest, snags and tree cavities for nesting (Winter 1986, Bull et al. 1988, Bull and Henjum 1990, Wu et al. 2015, Wu et al. 2016). Canopy cover at nest stands ranges from 65-100% (Winter 1986, Beck and Craig 1991, Greene 1995, Beck and Winter 2000, Wu et al. 2016, p. 23). They require up to six large snags per acre (Beck and Winter 2000).

The great gray owl uses meadows between 100-1,120 acres in size for foraging (Winter 1986; Sears 2006). Nests are usually within 0'-900' of meadows; in three studies, 90% of nests were within 800'(Winter 1982, Greene 1995, Sears 2006). In another study focused on low elevation territories, 20% of nests were located over 2,600' from meadow (Wu et al. 2015). At higher elevation, above 4,000 feet, wet meadows account for 75% of great gray occurrence in a Yosemite habitat model (Keane et al. 2011, p. 19). Ungrazed, wet meadows are the principal habitat component found to support stable great gray owl territory occupancy throughout 20 years of monitoring (Keane et a. 2011, p. 20). Researchers observe the difference in great gray reproduction and territory stability seen in Yosemite compared to the Stanislaus and Sierra National Forests is related to habitat quality differences seen in ungrazed, wet meadows compared to drier, lower elevation, grazed meadows (Keane et al. 2011).

Meadow vegetation is important to support prey for great gray owls. Research has consistently found a vegetation height around 12" is necessary to support great gray owl breeding. Greene (1995), Wu et al. (2016, p. 51), Kalinowski (2014), and the US Forest Service (2001) all recommend a 12" stubble height, or 8" sward height, for breeding great gray owls. There are three species of voles in the Sierra Nevada that great gray owls depend on for breeding, and they all require tall vegetation. Great grays usually need access to both voles and gophers to produce young (Wu et al. 2016, p. 28). The abundance of these prey species is cyclical; most notably voles, but gophers, too, are found to shift abundance up to 62% from year to year, based on meadow soil moisture (Kalinowski et al. 2014, p. 554). It is important for land managers to provide high quality habitat for all great gray owl prey species because all prey species demonstrate some cyclic abundances.

2. Threats to Great Gray Owl

Great gray owls nest in snags and broken top trees (Winter 1982; Bull and Duncan 1993; Siegel and DeSante 1999). Snag removal and large tree removal are threats that likely reduced historic populations and continue today (Winter 1982; Winter 1986; Bull and Duncan 1993; Siegel and DeSante 1999; Rich 2002). North America has lost 6% of forest cover in last decade (Hansen 2010), while the Sierra Nevada has lost 43% of old forest in past 50 years (Zielinski 2005). Forest habitat loss continues as described in recent EIS documents from the southern Sierra, as well as the current conifer die-off estimated at 26 million trees earlier this summer.

Livestock grazing, and impacts from roads and mining on meadows also affect great gray nesting resources, primarily prey abundance (Wu et al. 2016, p.27-28). Great gray owls depend on meadows to feed their young, and meadow vegetation ought to support several prey species for successful owl reproduction. The owls' productivity appears linked with population cycles of prey, and overall prey abundance may be more important than species composition (Wu et al. 2016, p.29-30); therefore it is important to manage for more than one prey species, and dense meadow vegetation supports greater numbers of prey species (Kalinowski et al. 2014, p. 552). Areas excluded from grazing produce more preferred prey (voles) (Greene 1995; Kalinowski 2014), and more likely stable great gray owl populations (Keane et al. 2011). Indeed, genetic structuring suggests a source-sink population dynamic between Yosemite National Park and surrounding National Forest lands related to habitat quality (Keane 2011, p. 23).

Great gray owl are one of 16 Sierra Nevada bird species considered moderately vulnerable to climate change due to their limited dispersal capability, restricted diet, and recent population bottleneck (Siegel et al. 2014, appendix at 5, 18 and 20). Other ongoing conservation concerns are vehicle strikes (Maurer 2006), and disease, including trichomoniasis and West Nile virus (Keane et al. 2011, p. 5). Three species of owls in the Sierra Nevada have been found with secondary rodenticide poisoning (Thompson et al. 2013, p. 8). Due to the prevalence of rodenticide use, it is likely that great grays were exposed as well.

3. The Plans Do Not Adequately Identify Threats to Great Gray Owl

The management guidance to maintain the specific ecological conditions necessary for viability or mitigate the stressors that affect them, suffers from lack of specificity for many at-risk species,

including great gray owl. For instance, there are no plan components referenced that provide adequate vegetative cover for voles, yet these are essential ecological conditions to great gray owl persistence (Winter 1986, Green 1995, Wu et al 2014, Wu et al. 2016). The DEIS also lists *"Degradation or loss of mid-elevation coniferous habitat and meadows and meadow complexes"* as a threat (p. 335), but doesn't specify how the habitat is degraded, nor what components of the habitat need protection. Therefore, this habitat remains unprotected in forest plans. Specific standards or guidelines must be created to ensure that the stressors acting on the species or its habitat are sufficiently mitigated, particularly for those stressors resulting from Forest Service management.

The DEIS mentions "*forestry practices*" as a threat to great gray owls (DEIS p. 335), but does not define the specific forestry practices or the specific necessary ecological condition being affected by the stressor. This makes it extremely difficult to connect the plan components to any necessary ecological conditions or stressors. This is turn makes it even more difficult to demonstrate that the plan components ensure viability. Increasing specificity does not necessitate much additional work, for example, one could further define this stressor as, *"Forestry practices that remove trees greater than 24 inches dbh and thinning nest stands (typically 50 acres in size) to below 65% canopy cover have the potential to degrade great gray owl nesting habitat."* The lack of specificity in the plan components leaves old forest environments, and the species upon which they depend, vulnerable to a new pace and scale of habitat degradation and loss, which threatens persistence of species of conservation concern in the plan area.

The DEIS and BE do not disclose the status of meadow and riparian habitat loss in the Sierra Nevada. However, meadow habitat loss and degradation in Sierra Nevada montane meadow systems are both historical issues, beginning in the 1800s, and continue to be a conservation issue today (Greene et al. 2003 p. 34)

Similarly, unmanaged grazing is characterized as a threat in the DEIS,*"where plant cover is greatly reduced"* (p. 335). We agree there is a threshold at which grazing reduces plant cover and affects great gray owl species, but the habitat requirements of great gray owl and other at-risk species must be the source of sideboards for grazing management. With such a general statement about plant cover reduction, it is not clear what amount of plant cover is considered adequate or problematic, and what amount poses a threat to great gray owls.

4. Plans do Not Adequately Describe Great Gray Owl Meadow Habitat

According to the BE, the two most important habitat factors for great gray owl are availability of nest sites and suitable meadow foraging habitat (p. 40). Yet, a complete account of ecological characteristics required by at-risk species are never provided in the DEIS, as promised (DEIS p. 309). The BE offers one assessment of great gray owl habitat: *"This species is strongly associated with relatively large meadows, and the number of large meadows has not changed significantly in the last decade; therefore, habitat status for this species has not significantly changed over the last decade."* (BE p. 40). This conclusion is reckless and unsubstantiated.

The conservation status of gray owls is not simply dependent on the number or large meadows on the landscape. To make a habitat status assessment, the agency should begin by looking at the

habitat quality in these meadows at the very least. The quality of meadow habitat is critical, as is the forest structure surrounding the meadows. Vegetation height, meadow size, soil moisture, prey density, snag density, nest site availability, and old forest structure surrounding meadows, are all habitat elements that have been hypothesized to influence great gray owl occupancy, fecundity and persistence in the Sierra Nevada (Winter 1986, Greene 1995, van Riper and van Wagtendonk 2006). Because owl habitat needs are not discussed in detail anywhere in the DEIS, the threat of habitat loss (DEIS, p. 335), remains unaddressed in the proposed Southern Sierra plans.

Unmanaged grazing is identified as a threat that has left meadows gullied and drying, but categorized as something that happened 100 years ago. The DEIS/BE fails to acknowledge or analyze impacts from current condition of meadows on Inyo NF, Sierra NF, and Sequoia NF from continued unsustainable grazing regimes. As described in the meadow habitat condition section above, considerable amounts of meadow rangeland are not maintained in proper functional condition in the plan area. The impacts of current management, in light of the recommendations calling on land managers to do more to restore and protect meadows for species such as great gray owl (i.e., Kalinowski et al. 2014, Wu et al. 2016), were not adequately addressed in the DEIS.

5. Desired Condition for Great Gray Owl and Riparian Conservation Areas Identified, but No Plan Components to Ensure Desired Conditions are Met

Riparian conservation area (RCA) and range standards do not meet desired conditions for RCAs and great gray owl. The following plan components are in SNF and SQF Draft Plan Revisions and are presented in Table 83 as plan components for habitat integrity, sustainability and or species persistence (DEIS p. 350). They are too general, and are very similar to the language in the Planning Rule itself, rather than specifying what the conditions need to be to contribute to recovery, persistence, of great gray owl.

- RCA-MEAD-DC 02 *"…wet meadows…support stable herbaceous and woody vegetative communities that are resilient to drought, climate change and other stressors…. these ecosystems sustain their unique functions and biological diversity."*
- RCA-MEAD-DC 05 *"Meadows are in mid- to late-seral condition, with substantive ground cover and a rich and diverse species composition, especially of grasses and forbs. Meadows have high plant functional diversity with late successional functional types represented."*
- RCA-MEAD-DC 07 *"A complexity of meadow habitat types and successional patterns support native plant and animal communities. Meadow species composition is predominantly native, where graminoid (grass-like) species are well represented and vigorous, and regeneration occurs naturally… management activities are sufficient to maintain desired vegetation structure, species diversity, and nutrient cycling."*
- MA-RCA-DC 15 *"Ecological conditions contribute to the recovery of threatened, and endangered species, conserve proposed and candidate species, and support the persistence of species of conservation concern."*

The desired conditions below also lack a numeric description of the canopy cover, large tree density, and average tree size, that are required for great gray owl breeding habitat:

SPEC-GGO-DC 01 *"Meadow vegetation in great gray owl PACs supports a sufficiently large prey species population to provide a food source for great gray owls through the reproductive period."* It is a good start, but in order to assess if this desired condition is achieved, the Forest Service should describe what high quality great gray owl foraging habitat is, how grazing may affect it, and how the plan components ensure that it will be maintained. Instead, there are no plan components that spell out what great gray owl prey species are, what prey habitat is, how to manage for it throughout the breeding season, or even when the breeding season starts and ends.

The desired condition, TERR-OLD-DC *02 "The landscape contains a mosaic of vegetation types and structures that provide foraging and breeding habitat, and movement and connectivity for a variety of old forest associated species"* does not mention great gray owl or its habitat requirements, so how does this desired condition provide for great gray owl sustainability or viability? Providing generally for a variety of old forest species leaves out details important for species at risk based on their habitat requirements. Otherwise, it is possible to provide for a *"variety of old forest species"* without providing for great gray owl. For example, old forest connectivity between meadows might be important for great gray owl, but not fisher, so a plan could provide connectivity for fisher and not great gray owl. Species-targeted desired conditions are needed for most if not all at-risk species.

The TERR-OLD-DC 05 states, *"Old forests are composed of… snags, large logs and decadent older trees…maintained on the landscape in sufficient numbers to benefit wildlife"*, but the sufficient number is never quantified in a corresponding standard or guideline according to what Forest Service biologists and other biologists have described in the scientific literature. If threats are identified in detail, then desired conditions can be developed to address threats or stressors, and provide for ecological conditions needed by SCC. Plan components focused on ecosystem properties without properties focused on at-risk species do not meet the viability standard in the planning rule (Hayward et al. 2016, USFS WO white paper, p. 2).

6. Plan Components Lack Specificity

The plans lack species-targeted plan components to protect great gray owl breeding habitat. For example, there are two plan components offered in the SNF and SQF plans to protect great gray owls, but neither one protects forest habitat they use to nest. There are no plan components to protect large trees or snags in PACs (or outside PACs), yet these are essential ecological conditions to the integrity of old forests that great gray owls depend upon (Winter 1986, Green 1995, Wu et al. 2016). Specific standards or guidelines should be created to ensure that each of the significant limiting ecological conditions necessary for species persistence are provided and the stressors acting on the species or its habitat are sufficiently mitigated, particularly for those stressors resulting from Forest Service management.

The plan components below are presented in Table 83 of the DEIS (p. 350) as components for habitat integrity, sustainability and/or species persistence; however, they do not quantify or provide for great gray breeding habitat requirements as described in best available science:

TERR-OLD-GDL-01*"When large tree densities meet desired condition levels, thinning to increase heterogeneity and resilience should emphasize retention of the oldest and largest trees, especially pines and black oaks…"* This guideline does not provide species-targeted protection of habitat near meadows needed by great gray owl. Similarly, TERR_FW_GDL 01 says projects should retain large trees, snags and trees with broken tops. This guideline lacks specificity to ensure these habitat elements are maintained in adequate density to meet great gray owl requirements to reproduce. Lastly, TERR_FW_GDL 03 also lacks specificity regarding the location of these habitat elements to ensure these nesting structures are located where great gray owl can use them--near meadows.

In another example of lack of specificity, the BE says suitability of foraging meadows for great gray owls depended primarily upon prey availability, meadow vegetation height and cover, and soil moisture (quoting Seers 2006). Even though these habitat conditions were acknowledged as important, they are never thoroughly incorporated to the plans. For example, in SPEC-GGO-GDL-01 "*Meadow vegetation in great gray owl PACs supports a sufficiently large prey species population to provide a food source for great gray owl through the reproductive period*" is never translated into a standard to provide appropriate vegetation heights for voles (12") and gophers (5"-12") (Greene 1995, Kalinowski et al.2014, Wu et al. 2016).

The same can be said for SPEC-GGO-GDL 01: *"In meadow areas of great gray owl protected activity centers, maintain herbaceous vegetation at a height commensurate with site capability and habitat needs of prey species. Follow regional guidance to determine potential prey species and associated habitat requirements at the project level."*The guideline acknowledges great gray owl use of meadows, but well-known requirements about prey species, meadow vegetation condition, and forest structure are not incorporated. Here, the Forest Service should use the 2016 great gray owl conservation strategy developed by CDFW recommendations to maintain a 12" stubble height or 8" sward height in meadows used by great gray owls. The guideline above instead directs forests to determine potential prey species and associated habitat requirements at the project level. Further, the guideline refers to regional guidance not provided to us even though Sierra Forest Legacy requested it at the end of June, 2016. The herbaceous vegetation height commensurate with habitat needs of prey is well known information from the literature, there is no reason to leave this up to every ranger district to determine separately during project planning. This is a waste of time and resources, and at worst, it introduces the possibility that a unit could misinterpret science or mismanage essential habitat for species at risk.

Again in MA-RCA-GDL 08 *"Under intensive grazing systems where meadows are receiving a period of rest (e.g., rest- rotation and deferred rotation), utilization levels can be higher than the levels described above if the meadow is maintained in late seral status and meadow-associated species are not being impacted."* This guideline allows for utilization levels, already minimal and already not being met in many meadows (see meadow condition section of this letter), to be breached more often. There are no components that provide specific great gray owl habitat requirements, so a loophole is provided for breaching utilization levels, without specific thresholds for impacting habitat or species. Indeed, the meadow-associated species supposedly 'protected' under this guideline are not even named. Meadow conditions are compromised in the plan area, which makes this permissive guideline an even bigger concern.

7. Plan Components Presented as Providing for Habitat Integrity, Sustainability and or Species Persistence Actually Threaten Great Gray Owl Persistence in the Plan Area

The following plan components do not provide minimum habitat requirements of great gray owl, and conflict with the desired conditions in Table 83 of the DEIS. Not only that, these standards are presented in the DEIS as examples of how the plans will provide for great gray owl sustainability. However, the following not only do not achieve this goal, they contradict best available science about owl habitat needs.

The standard, MA-RCA-STD 16, *"Degraded meadows (such as those in early seral statuses with greater than 10 percent of the meadow area in bare soil and active erosion) require total rest from grazing until they have recovered and have moved to mid- or late seral status."* This is presented in the DEIS as providing for great gray owl sustainability. We do not see how that it is provided in this standard. Again, providing against worse case grazing management does not ensure that habitat requirements of great gray owl are provided.

MA-RCA-STD 14 says *"Under season long grazing: For meadows in early seral status: limit livestock utilization of grass and grass- like plants to 30 percent (or minimum 6-inch stubble height). For meadows in late seral status: limit livestock utilization of grass and grass-like plants to a maximum of 40 percent (or minimum 4-inch stubble height)."* A 4 inch stubble height does not provide adequate meadow vegetation to support preferred prey species for great gray owl-gophers ***and*** voles. This stubble height is inadequate to provide ecological conditions that maintain or enhance great gray owl populations as required (Winter 1982; Winter 1986; Greene 1995; Beck and Winter 2000; Kalinowski et al. 2014).

Another issue related to the range management plan components not providing suitable meadow breeding habitat for great gray owl is that maintaining a 4 inch stubble height in meadows threatens great gray owl viability. The Sierra and Sequoia plan component, RANG-FW-STD 06-07 (SNF, p.94) *"Maintain 4" stubble height in meadows in satisfactory condition and 6" stubble height in meadows with unsatisfactory condition"* does not meet reproductive habitat needs of great gray owl. In unoccupied or unsurveyed meadows, great gray owl habitat will be eliminated under this standard.

Although the 4" stubble height is a 2004 FSEIS standard, it is based on a misquote of Mr. Tom Beck; furthermore the adequacy of this stubble height in great gray PACs has never been substantiated in any published literature. From SNFPA ROD FSEIS Errata Oct. 8, 2004. *"10. FSEIS vol1 p153. GGO diet, fourth sentence should read "Optimal vegetation height for voles is assumed to be 5-15" tall (Beck 1985), although other studies suggest herbaceous heights of 12" are preferred (Greene 1995)."* (p.2 of 3). The 2004 SFEIS is well known to have misquoted Mr. Beck and to have used a shorter stubble height than any biologist actually ever recommended. A 4" stubble height should have no place in Sierra Nevada rangeland management.

The allowance of a 4" stubble height in some montane meadows is arbitrary, and contrary to best available science for great gray owl habitat management. Recent scientific research has confirmed that the vegetation height requirements for great gray owl are clearly greater than 4":

- Beck and Winter (2000): manage for 5-10" residual dry cover for great gray owl.
- Greene (1995): Manage for a 12" vegetation height.
- Kalinowski (2014): Manage for a 5"-11.4" stubble height, or 8" sward height. Recommends excluding cows from meadows when managing for voles.
- Wu et al. (2016): manage for a 12" stubble height, or 8" sward height.

Possibly as a result of the 2004 plans, Forest Service rangelands are suspected of lacking ecological conditions necessary to ensure viability. Habitat quality differences is the leading explanation for *"source-sink population dynamics operating between Yosemite National Park and surrounding National Forest lands"* (Keane et al. 2011, p. 20). Grazing is the primary management difference between the National Forest and National Park lands.

After studying prey habitat dynamics of great gray owls in National Forest lands, Kalinowski et al. (2014) recommend not grazing when managing for voles, and pairing grazed and ungrazed meadows in PACs to manage for both voles and gophers (p. 554 and 555). Yet, no standards are in place to provide specifically for voles, an essential component of great gray owl breeding diet. This omission is contrary to the desired conditions for great gray owl, 'SPEC-GGO-DC 01'. It is clear that meadows with a 4", or even a 6" stubble height will not support voles (Green 1995, p. 84; Kalinowski et al. 2014, p. 554). What is not clear is how the Forest Service plans to provide ecological conditions necessary to ensure great gray owl viability, specifically how the Service will manage for 3 out of 4 preferred prey species (3 vole species), with a 4" or 6" stubble height.

Another issue of concern is the lack of management direction to protect great gray owl nesting habitat in PACs, despite the stated threat of nesting structure loss (DEIS p. 335). The PACs are designated in 5M, 5D, 6, and there is no restriction on forest management (SNF plan p. 166-176). By contrast, there is more detailed management direction in spotted owl PACs (SNF, p. 99), although focus areas and other proposed treatments threaten even old forest habitat there. Species-targeted management direction is needed for great gray owl PACs that protects both nesting habitat and meadow vegetation from habitat.

Lastly, the guideline SPEC-FW-GDL 01: *"Known rest, roost or den trees used by SCC…should not be removed, with the exception of hazard trees"* does not offer sufficient protection of most nest trees, since most nest trees have defects, cavities, or leans, or broken tops, mistletoe, etc. And, given the extent of the roads system on National Forest lands, there would likely be a substantial number of activity centers that technically qualify as hazard trees and could be cut down under this guideline. However, there are a total of 11 great gray PACs on the Sierra NF, and one on the Sequoia (DEIS, p. 335). With only one activity center per PAC or core area, it's hard to imagine that the existence of 12 known nest or roost trees in the Southern Sierra warrants an exception to the nest tree protection guideline. Perhaps the planning team should ask for a review of great gray owl PAC activity centers to confirm that there aren't any human lives currently threatened by one of the 11 known great gray owl activity centers, and if not, then the team should delete the exception from this guideline, because it will certainly do more harm than

good. A loophole or lack of nest tree protection near system roads could compromise the purpose of a PAC.

8. Example of Species-Targeted Plan Components That Can Still Allow for Management Flexibility

The plan component SPEC-GGO-GDL 02 states: *"During vegetation management activities, apply a limited operating period, prohibiting vegetation treatments and road construction within 0.25 mile of an active great gray owl nest stand, during the nesting period (typically March 1 to August 15). The limited operating period may be waived for vegetation treatments of limited scope and duration if a biologist determines that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing and specific location. If a biologist concludes that a nest site would be shielded from planned activities by topographic features that would minimize disturbance, the limited operating period buffer distance may be reduced."*

We applaud the Forest Service in developing this guideline because it is species-targeted, science-based, and also provides flexibility for management when negative impacts to owls can be avoided. The guideline works because it provides species-targeted quantifiable details like, a start and end date that is grounded in current owl biology, a distance from the nest stand that mechanical activities may occur, and there are site-specific exemptions allowable, if a biologist determines that owls may be shielded from disturbance. Every guideline and standard should be this specific. As we can see here, it can be done, it can provide ecological conditions necessary to contribute to species viability, as well as still provide flexibility for management. Similar specific, quantifiable, science-grounded habitat management direction is needed to protect and provide for great gray owl persistence, and for other at-risk species.

9. Great Gray Owl Are Not Grouped with Old-Forest Species in Draft Land Management Plans

We are concerned that the DEIS does not clearly identify habitat associations for each species evaluated. Old forest associated species such as fisher, spotted owl and marten are targeted with plan components intended to address their specific habitat needs in the plans. Although we are quite concerned about the impacts of the proposed plans on fisher, spotted owl and marten, it seems a huge oversight to not group great gray owl along with these old forest species. The following plan components needlessly exclude great gray owl: SPEC-FW-GOAL 04, SPEC-CSO-PF-SM-GDL-01. Great gray owl is also not mentioned as an old forest associated species of conservation concern on p. 29 on SNF plan, and there is a similar issue with SQF. The DEIS says old forest habitat plans will *"focus on maintaining ecological integrity for certain at risk species such as California spotted owl and Pacific fisher"* but not great gray owl (DEIS p. 27). *"Standards and guides prohibit treatments in spotted owl PACs and prohibit mechanical treatment in designated spotted owl habitat unless there are short term benefits to owls."* (DEIS p. 33). This plan consideration also ignores great gray owl.

Great gray owls are clearly an old forest associated species (Winter 1986, Bull et al. 1988, Bull and Henjum 1990), even in lower elevations below 4,000 feet, where black oak are sometimes used for nesting in mixed conifer stands, owls still select from the largest (and oldest) trees in the

stand (Wu et al. 2015, Wu et al. 2016). The current forest plan even categorizes them as old forest dependent (USFS 2001, FEIS Appendix R, p. 8). Further, their requirement for nesting includes large trees averaging 39" dbh, either conifers or in some cases oak (Wu et al. 2015, p. 946), with dense overhead cover, greater than 85% in mixed conifer old forests (*Id.*).

We hope that the final plans will propose more responsible old forest habitat protections that include great gray owl. Great gray owls also have unique old forest habitat needs because they require forest habitat in close proximity to meadows, which is also omitted from the effects analysis. Additionally, the impact of excluding great gray owl and its habitat from old forest groupings in the plans is not disclosed anywhere in the DEIS or BE.

10. The Great Gray Owl Survey Approach Leaves Nests Vulnerable to Logging

The plan components do not protect old forest nesting habitat for great gray owl, such as old forest and snags specifically near meadows or recent burned areas, outside PACs. "*Conduct additional surveys using established protocols…(to follow up reliable sightings of great gray owls)*" is a management strategy (SNF p. 88), but should actually be a standard. This strategy requires following up on reliable sightings, but should also require surveys if habitat modification is proposed in unoccupied suitable habitat. This recommended approach is exactly what is required for spotted owl (see SPEC-CSO-GDL-01 & 02), and needs to be replicated for great gray owl.

The lack of great gray owl survey requirement in suitable habitat essentially puts a freeze on the number of PACs, despite presumed recruitment of new pairs into the future. Great gray owl suitable nest sites are a moving target, and failing to conduct surveys along old forest habitat on the edge of 5-10 year burn area, for example, does not protect owls setting up new territories as they are known to do (R .Bridgman & A. Rich, Stanislaus NF, personal communication). In addition, the lack of survey requirements for project planning violates the current Region 5 Great Gray Owl survey protocol:

> Triggers for Protocol
> Within the Sierra Nevada exclusive of the area subject to management requirements of the Pacific Northwest Forest Plan, the following areas will require surveys:
>
> Where proposed ground-disturbing activities, including logging, prescribed burning, and grazing, are above the minimum elevation, the minimum elevations are 2000 feet in the northern Sierra, 2500 feet in the central Sierra and 3500 feet in the southern Sierra; and activities proposed are within mid- or late-seral forest stands that correspond to California Wildlife Habitat Relationships (Mayer and Laudenslayer 1988) size class 4 (average size of dominant and co-dominant trees 12-23 in.) or larger with canopy closure greater than 60%, or are within meadows that which total 10 acres or more and represent a potential territory for great gray owls; and activities, if in forest stands, are within 440 yards of a natural meadow or meadow-complex

> that totals 10 acres or more and represents a potential territory for great gray owls. (Beck and Winter 2000, p. 5).

Without survey requirements during project planning, the proposed management direction not only violates existing survey protocol, it also does not allow for recruitment of great gray owl habitat. The DEIS identifies *"loss of mid-elevation coniferous habitat"* as a threat (p. 335), but no protection of habitat outside of already established PACs is offered. Under the current plans, suitable habitat currently mapped outside of a PAC (or in a PAC in a focus area) can be rendered unsuitable by proposed forest canopy cover reductions, snag density reductions and meadow vegetation height reductions to the point where it is no longer suitable for great gray owl reproduction, which threatens species persistence in the plan area.

11. The DEIS Does Not Disclose Plan Impacts to Great Gray Owl

Great gray owl needs for snag density, broken top trees, large trees, old forest in proximity to meadows, and meadow vegetation conditions are all described in detail in current literature. Yet the expected changes to these habitat components due to plan implementation are not disclosed for use by the decision maker or the public, contrary to NEPA.

The DEIS does not provide basic information about how many PACs would occur in focus area treatments; or, how many are subject to community and general wildfire protection zones, or, what the impacts of management will be in these areas with acres of high, medium and low quality nesting and foraging habitat. The BE simply states that *"Habitat protection for great gray owl was utilized in the creation of the DEIS…*" and *"…the combination of large trees as well as snags is provided for in each alternative."* (p. 42). These statements cannot be taken in lieu of a quantitative effects analysis. The BE determination is never substantiated with any analysis or discussion. And it is not clear if these habitat protection measures, whatever they were, were even applied to the draft plan components. The habitat protection measures were never disclosed in the BE. Thus, the Forest Service never discloses how many large trees and snags will be provided and for how many great gray owl territories, and the location of this habitat. Will it be within 800 feet of meadows where great gray can use it (Winter 1982, Greene 1995, Sears 2006)?

The determination states *"Implementation of the Forest plan may affect great grey* [sic] *owl but will not lead towards Federal listing or a loss of viability. Impacts to great grey* [sic] *owl are beneficial impacts such as reducing the risk of catastrophic wildfire by restoring conifer areas while still maintaining large trees and snags and restoration of meadows to allow for prey species."* (p. 43). This effects determination does not acknowledge any negative impacts of the proposed plans on great gray owl, let alone quantify those impacts. The Forest Service does not explain how implementation of Alternative B, C and D is expected to be entirely beneficial to the great gray owl.

We note that there is considerable uncertainty surrounding how to accurately estimate vegetation management impacts to wildlife (Holzhausen 2002). This uncertainty widens when estimating long-term impacts (Hayward 2016). The BE concludes that impacts to great gray owl of the plans will be positive in the long-term, and does not mention short term impacts at all. This

omission, plus not recognizing uncertainty in the effects analysis, violates NEPA requirement that the decision maker and the public be informed of all impacts prior to issuing a final decision.

Regarding the lack of an upper diameter limit in both the community and the general wildfire protection zones, (encompassing 361,750 acres on the Sierra NF, 543,299 acres on the Inyo, and 394,650 acres on the Sequoia NF) the DEIS asserts that *"Large-tree removal can have-short term impacts on mature-forest-associated wildlife species, but overall, the removal of large-diameter trees under this alternative and alternative D is expected to improve long-term habitat condition in these zones."* (p. 377). Large trees are usually 150 or more years old, so removing them will have negative impacts to great gray owl for at least that long after they are cut. The consequences of old forest removal are minimized in the DEIS in an arbitrary manner that is ungrounded in science.

In another example, the forest plan BE says great gray owl need an average of 70% canopy cover and minimum of 40% (BE, p. 42). Old forest desired conditions are described as providing 40%-60% of moist mixed conifer with suitable nesting habitat (CWHR 4, 5, & 6) on the landscape (Sierra draft plan, p. 16, appears in all 3 plans). Canopy cover for red fir is proposed to be 10-40% (Sierra draft plan, p. 23, appears in all 3 draft plans). It is not clear how many acres of dense mature forest the plans will provide, or how much of it is located near meadows and is suitable for great gray owl. Furthermore, the impact of not managing old forest habitat at less than the average canopy cover used by great gray owl is not disclosed, and is expected to be a negative impact.

The BE does not describe <u>any</u> negative impacts to great gray owl from the proposed plans: *"Implementation of the Forest Plan* (SQF and SNF) *may affect great gray owl but will not lead towards Federal listing or a loss of viability. Impacts to great grey owl* [sic] *are beneficial, such as reducing the risk of catastrophic wildfires by restoring conifer areas while still maintaining large trees and snags and restoration of meadows to allow for prey species."*Further, *"Late seral stage habitat is within each alternative and the combination of large trees as well as snags is provided for in each alternative."* This is an assumption that is not grounded in science and is contrary to NEPA's "hard look" standard. The brief analysis in the DEIS and BE neither informs the public nor the decision maker, as required.

Furthermore, the BE and DEIS do not disclose the expected impact of removing the requirement to survey for great gray owls prior to ground disturbing activities. Surveys are required for great gray owl under both the 2001 and 2004 Sierra Nevada forest plan revisions. Surveys are also recommended by CDFW (Wu et al. 2016) and the US Forest Service's own great gray survey protocol (2000). The regretful negative impact of increased logging and zero survey effort to the great gray owl and breeding habitat is never mentioned in the DEIS or BE.

Impact of 'flexibility' of forest plans is not disclosed. For example, TERR_FW_GDL 01 says projects should retain large trees, snags and trees with broken tops, which are used by great grays and other old forest associated species. However, this guideline lacks specificity to ensure these habitat elements are maintained in adequate densities to provide great gray reproductive habitat requirements. The impact of leaving the possibility of not retaining adequate reproductive habitat is not disclosed to the decision maker, nor to the public, contrary to NEPA.

Similarly, the component TERR_FW_GDL 03 also lacks specificity regarding the location of these habitat elements to ensure these nesting structures are located where great gray owls can use them--mostly within 800 feet of meadows. And, under guideline SPEC-FW-GDL 01: *"Known rest, roost or den trees used by SCC…should not be removed, with the exception of hazard trees"* there would likely be a substantial number of activity centers that technically qualify as hazard trees and could be cut down under this guideline. The impact of not protecting nest trees that qualify as hazards under Alternatives B, C and D was not disclosed during plan analysis in the DEIS or BE. How many known or potential nests are located near roads (is it within 300 feet under hazard tree guidelines? And how much of PACs would be affected by level 2-5 hazard tree management? What are the cumulative effects of past and ongoing hazard tree sales on great gray owl? No impact assessment was made in DEIS of this proposed plan component, contrary to NEPA.

In a related issue, the plan component MA-RCA-GDL 08 *"Under intensive grazing systems where meadows are receiving a period of rest (e.g., rest- rotation and deferred rotation), utilization levels can be higher than the levels described above if the meadow is maintained in late seral status and meadow-associated species are not being impacted"* is vague and habitat alteration could occur under these guidelines that furthers management risks described in recent literature. The impact of this guideline on great gray owl habitat and persistence in the plan area is not discussed in detail.

Impacts to great gray owl from implementation of the plan component SPEC-GGO-GDL 01 *"In meadow areas of GGO PACs, maintain herbaceous vegetation at a height commensurate with site capability and habitat needs of prey species. Follow regional guidance to determine potential prey species and associated habitat requirements at the project level"* are also not disclosed. This guideline does not mention that voles are associated with great gray owl nest sites, and voles are also associated a 5"-12" meadow vegetation height. This vegetation height range should be incorporated into plan components. The impacts of instead allowing a 4" stubble height for season long grazing in riparian conservation areas, while best available research suggests this would not meet foraging needs of the species during reproduction (add citations Green 1995, Keane et al. 2011, Kalinowski et al. 2014), is not adequately disclosed.

Finally, the plan component RANG-FW-GOAL 03 (p. 83):*"Extend grazing seasons into winter and early spring on low elevation annual grass rangelands…"* has the potential to negatively impact great gray owl at lower elevations. This is because an estimated 21% of the population occurs below 4,000', and breeding is not always associated with meadows, according to Wu et al. (2015), and these grasslands sometimes act as meadow surrogates, especially at low elevations. This impact is not disclosed or analyzed, contrary to NEPA.

12. Standards Use Vague, Subjective Language, Do Not Conform to Handbook Definitions in 1909.12

We believe that some of the inadequacies of the plan components to ensure species viability would be addressed if the proposed plan components conformed to the relevant regulatory definitions described in the FSH 1909.12 Chapter 20. An important requirement, which we

believe has not been met by many of the components in the draft plans, is that plan components, *"Are written clearly and with clarity of purpose and without ambiguity so that a project's consistency with applicable plan components can be easily determined."* (FSH 1909.12, 22.1).

Many plan components presented as providing for habitat integrity, sustainability or great gray owl persistence, use subjective language that is not defined in the plans. For example, separate standards are given for montane wet meadows and early seral meadows, but no definition of each is given, and it seems possible they may overlap somewhat. If montane wet meadows and early seral meadows actually do overlap somewhat, then MA-RCA-STD 14 (Sierra draft plan, p. 62) for a 6" stubble height contradicts RANG-FW-STD 06 (Sierra draft plan, p. 94) for a 4" stubble height. And, a determination of 'satisfactory' vs. 'unsatisfactory' condition is also undefined, subjective, and thus arbitrary.

In another example, the following standard uses vague, undefined language but is presented as contributing to great gray owl conservation: MA-RCA-STD 16 *"Degraded meadows (such as those in early seral statuses with greater than 10 percent of the meadow area in bare soil and active erosion) require total rest from grazing until they have recovered and have moved to mid- or late seral status."* In this standard, meadows can be managed for late seral status while still outside of proper functioning condition, or can fail to provide habitat conditions for great gray owl prey species- voles and gophers. These plan components do not protect great gray owl sustainability as they are presented. This standard should be more species-targeted and specify the vegetation height requirements of voles and gophers (great gray prey).

Basic rangeland indicators used across three forests are also different. How can range condition be compared regionally or assessed in a similar, unbiased way if measures are different on every forest? For example, the Sequoia NF does not report proper functioning condition for meadows and riparian habitat in its assessment. The Sierra and Sequoia forests do not report multiple upland vs. meadow measures in the same way Inyo NF does.

Numerous concerns arise when general concepts such as heterogeneity, resilience, late seral status of meadows, and meadow-associated species are not defined. For example, in MA-RCA-GDL 08 *"Under intensive grazing systems where meadows are receiving a period of rest (e.g., rest- rotation and deferred rotation), utilization levels can be higher than the levels described above if the meadow is maintained in late seral status and meadow-associated species are not being impacted."* Please identify the specific "meadow associated species." Are we talking at-risk species, or white crowned sparrows, or crane flies? Positive or negative impact? Who makes the determination about the impact? It does not serve the resources to leave these undefined in the plans. Clear and unambiguous language is required under FSH 1909 Ch. 20. Without consistent implementation of plan components that may affect the ecological conditions necessary to ensure species viability from project to project, species viability cannot be ensured.

Further, the FSH 1909.12 Ch. 10 requires a range assessment to assess sustainability of ecosystems associated with rangelands such as meadows. The Forest Service must disclose monitoring results of the impacts of grazing on ecological integrity and species diversity. The forest assessments minimally report on these conditions, for example, the Sierra National Forest reports on a few condition assessments and concludes, *"sites in this condition allow for*

satisfactory ecological health, biological diversity and resilience." But the assessments do not explain how these conditions provide for these values if conditions are reported outside of proper functioning condition (PFC) or are functioning at-risk (FAR) (see NFMA meadow condition section above).

13. Rationale to Not Include Great Gray Owl as Species of Conservation Concern for Inyo is Not Sufficient

The identification of species of conservation concern in the current forest plan revisions is arbitrary, and contrary to NFMA, particularly in regard to Northern goshawk, great gray owl, and wolverine, as described below. A species of conservation concern is defined as:

> "a species, other than federally recognized threatened, endangered, proposed, or candidate species that is known to occur in the plan area and for which the Regional Forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area" (36 CFR 219.9(c).

The Forest Service is directed by FSH 1909.12 Ch. 10 12.5b(4) to:

> "Document the best available scientific information that supports not identifying a species that was considered but not identified as a potential species of conservation concern. Such rationale may include:
>
> a. Knowledge of the species abundance, distribution, lack of threats to persistence, trends in habitat, and responses to management, or
> b. Lack of sufficient information about the species' status."

Inyo NF records indicate great gray owl is known to occur within the plan area as required in FSH 1909.12 Ch.10 12.52c. The CNDDB and Winter (1986, p. 9, below) provide numerous, and regularly occurring records of great gray owl on the Inyo NF over 30-year period, particularly in Inyo County. These county records are also mentioned in the 2016 CDFW threatened and endangered bird species accounts online (https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=84008&inline p. 39-40). The Regional Forest's Sensitive Species (RFSS) review in 2012 also notes 'probable nonbreeding' records from 1970's in the Inyo NF, however it notes that dispersal capabilities for the great gray owl are 25 km (van Riper and van Wagtendonk 2006). Furthermore, the east-side Sierra Nevada great gray owls are assumed to originate from the Yosemite sub-species, rather than the Cascades population. Because great grays occur on the Inyo NF, it should be identified as a species of special concern (SCC). The DEIS states that great gray owls are not included as an Inyo NF SCC because their occurrences are incidental and they do not breed there. However, the DEIS also states that there are no records of breeding great grays on the Sequoia, but it is proposed as an SCC there (p. 335). The rationale that SCC are only to be protected on a National Forest if they breed there does not match the Sequoia NF proposal, nor the SCC selection parameters provide by the Planning Rule. SCC must simply occur in the planning area, they are not required to breed in the planning area to be identified as SCC.

The map below from Winter 1986 (p. 9) shows evidence of ongoing great gray owl occurrence in Mono and Inyo counties.

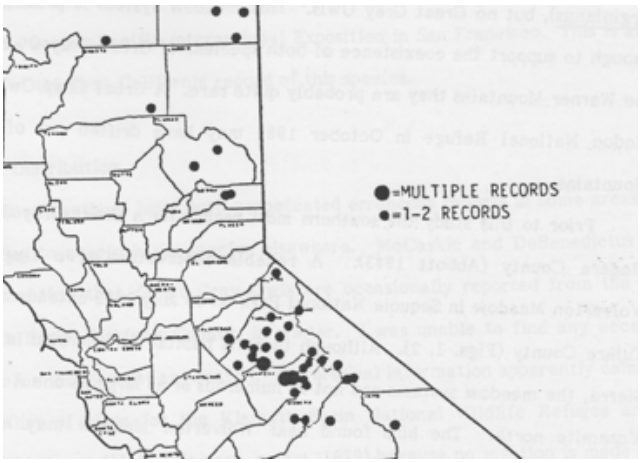

Figure 12. Ongoing great gray owl occurrences in Inyo and Mono Counties Source: Winter (1986, p. 9)

The Forest Service does not use best available science in determining the great gray owl as irruptive. The BE describes great gray owl as *"…throughout the range known to be irruptive"* (p. 40). However, this statement is not supported by the best available science information, because irruption behavior is primarily associated with lemming diets further north, and is seen in the *Strix n nebulosa* subspecies, which travels 100s of kilometers during these events (Hull et al. 2014, p. 69). The S. n. *yosemitensis* subspecies is not known for irruption (Wu et al. 2016, p. 32). This lack of irruption behavior in the Sierra Nevada adds further weight to the argument that owls that regularly show up on the eastern Sierra Nevada are dispersing from nearby breeding territories and define part of the species range. As a result, great gray owl should be kept as a species of conservation concern there, as well as on the west side of the Sierra Nevada.

The great gray owl has been on the RFSS list for the Inyo NF and a Management Indicator Species on the Inyo NF between 1988 until the 2007 MIS Amendment (Williams et al. 2012; INF LMP 1988). There is substantial scientific and agency evidence pointing to the need to continue to manage for this species habitat and protection on the Inyo NF. No new information has been presented to suggest otherwise. To the contrary, the recent findings that the Sierra great gray is a separate subspecies, and is undergoing a population bottleneck (Hull 2010), is even more reason to protect the owls where they occur and where they are able to disperse within the planning area. Even as recently as 2013, the Regional Forester identified great gray owl as a RFSS for the Inyo NF. The decision to not identify great gray owl as an SCC for the Inyo NF is inconsistent with recent agency decisions to include it as RFSS and an MIS for the Inyo NF, is inconsistent with rationale provided for including great gray owl as an SCC for the Sequoia, and, is inconsistent with the Planning Rule for identification of an SCC.

14. Recommendations

The revised DEIS must describe great gray owl nesting and foraging habitat using numeric values, including meadow vegetation height requirements, and naming primary prey species

(gophers and voles) using the best available science described above. Also use rangeland terms that are clear and well defined in the plans. Describe threats to great gray owl in more detail so that they can be addressed in plan components (ie. add more detail and quantify 'forestry practices', 'nest site availability'.)

Create species-targeted standards or guidelines to ensure that each of the significant ecological conditions necessary for viability are quantitatively described, and adequately provided. Ensure that significant stressors acting on great gray owls and the species habitat are sufficiently mitigated, particularly for those stressors resulting from Forest Service management, and that monitoring for compliance is assured.

Develop a range management strategy for great gray owl that incorporates Kalinowski et al. (2014) recommendation for not grazing when managing for voles, and to manage for voles in wet meadows excluding cows, and for gophers in drier sites (p.553).

Develop plan components using management recommendations Wu et al. (2016, p.5-10) including:

> Where CMAs ['Core Management Area,' the rough equivalent of a PAC] overlap a grazing allotment, periodically assess meadow ecological condition and implement appropriate measures to remedy negative conditions or trends including: active hydrologic restoration, reducing grazing pressure, fencing, allotment boundary revisions, resting, or retiring the allotment. Allotments with multiple CMAs should receive priority for assessment and adjusted grazing management (p. 51). (p .6)
>
> Maintain meadow vegetation at a 'sward height' of at least 20 cm (8 in; Kalinowski et al. 2014) at mid- and high-elevations. If it is not possible to use the sward plate methodology, maintain herbaceous vegetation at a stubble height of 30 cm (12 in; Beck 1985, Greene 1995). Where meadows in CMAs are grazed, refrain from grazing between February 15th and August 15th (Beck 1985, Beck and Winter 2000) unless a meadow assessment indicates that sward height standards and range conditions and trend standards are being met. (p. 6)

Riparian conservation area and meadow restoration needs: recruit nesting structures (snags, cavities, broken top trees, in oak, cedar and pine) near meadows, focus on hydrological restoration of wet meadows in National Forest lands and management of wet meadows.

Increase meadow productivity and tall vegetation resources for great gray owl at lower elevation meadows and meadow surrogates (Wu et al.2015).

Conduct wet meadow restoration near old forest and old forest protection near wet meadows to address mid-elevation conifer habitat loss threat identified by BE/DEIS. Also, address threats identified in Winter (1986), Greene (1995), Keane et al. (2011), Kalinowski et al. (2014), and Wu et al. (2016), that grazing in wet meadows eliminates vole habitat and thus diminishes great gray owl chances at reproduction.

Range should adjust season and number of head for allotments that are repeatedly not meeting utilization standards, or not maintaining meadows and riparian areas in proper functioning condition.

Maintain or enhance the condition of the streams associated with meadows in PACs. Set a high priority on the repair of gullies, head cuts, soil compaction, stream bank instability, and avoid grazing on riparian vegetation.

Enhance meadow and riparian vegetation to support prey species in meadow such as voles. Control conifer encroachment into meadows where they are not providing nest substrate (approx. <26" dbh). Conifers in the meadow provide perches for foraging, but can also shade and dry the meadow. Periodic thinning may be beneficial, but consider retaining tall stumps or girdling trees to retain perch values for areas where meadow is more than approximately 200' wide (Beck and Winter 2000).

Fencing is valuable for controlling grazing, but may adversely affect owl movement. Where possible, remove unused fences from within and around the meadows.

Describe great gray owl nesting and foraging habitat using numeric values, including canopy cover and snag density requirements, and old forest association (and mixed conifer can and does include black oak in the case of great grays) using the best available science. Also use rangeland terms that are clear and well defined in the plans. Describe threats to great gray owl in more detail so that they can be addressed in plan components (ie. add more detail to 'forestry practices' and 'nest site availability').

Incorporate recommendations for conifer encroachment issues, hunting perches, managing low nest stand cover for fledglings, vehicle strike reduction, and OHV management recommendations from the 2016 CDFW Great Gray Owl Conservation Strategy (Wu et al. 2016, p.5-10).

Providing for preferred prey includes providing for dead and downed wood in meadows (Bull and Henjum 1990). Provide a plan element to protect dead and downed material for voles in and near meadows.

Follow Beck and Winter (2000) survey protocol to survey 6 visits prior to any ground disturbing activity in suitable habitat (per Wu et al. 2016, p. 9). Plan components should require surveys of all old forest patches near meadows as well as meadow surrogates, including oak over grass, 2-10-year-old severe wildfires, and failed plantations (R. Bridgman, Tahoe NF, Stanislaus NF, personal communication). Not conducting surveys for great gray owl along old forest habitats that occur on the edges of 2-10 year burn area could result in missing occupied nest stands.

Regarding PAC delineation: Include entire acreage of meadow margin (roughly a 200 yard zone of forest edge surrounding the meadow) to be managed for nesting habitat. Note that historic nests have been found in inclusions of CWHR types 6, 5D, 5M, and 4D as small as 1/8 acre. Also include the meadow or meadow complex that supports the prey base for nesting owls (USDA Forest Service 2001a). Delineate the entire meadow or meadow complex where breeding

owls are detected. In total, 1,000 acres of forest and meadow may be needed to sustain a pair. Delineate great gray owl PACs to encompass the entire meadow that the nest site or detection is associated with, and include nearby stringer meadows or other possible foraging areas such as recent burns, failed plantations, grasslands, etc. The proportion of the meadow to include depends on habitat condition. Habitat condition can vary greatly from site to site and from year to year. Within territories, pellets/feathers/fecal spots/sightings/telemetry locations are typically found throughout the meadow or meadow complex most adjacent to a nest stand. The size of an adjacent meadow or meadow complex varies greatly for the species from 25 acres up to and including meadows hundreds of acres in size. Note that meadows that provide suitable foraging habitat at the lower end of range of meadow sizes (i.e. 25-30 acres) are typically in very high ecological condition (e.g., Crane Flat, Yosemite National Park).

L. At-Risk Sub-Alpine Carnivores: Sierra Nevada Red Fox and Wolverine

1. Overview of Sierra Nevada Red Fox Habitat Associations and Status in the Sierra Nevada

The range of the Sierra Nevada red fox extends from Oregon, south of the Columbia River, throughout the Cascades in Oregon, into California, and south across the Sierra Nevada mountains in California (Sacks et al. 2010). The montane red fox north of Columbia River in Washington state is now described as the Cascades fox (*Id.*).

In 2010, a population of Sierra Nevada red fox was rediscovered near Sonora Pass on the Humboldt-Toiyabe NF (Sacks et al. 2010). In 2015, the USFWS determined that the Sierra Nevada distinct population segment (DPS) of the Sierra Nevada red fox is "warranted but precluded" from listing under the federal ESA. This DPS is now a candidate species, whose range includes the entire Sierra Nevada, excluding the Lassen area and north (now distinguished as the Lassen DPS).

The Sierra Nevada red fox in California has undergone substantial declines recently, resulting in a population bottleneck and low genetic diversity (Sacks et al. 2010). Effective population size for Sierra Nevada red fox, excluding Lassen area and north, is 29 individuals (USFWS 2015a, p. 60994).

Sierra Nevada red fox is associated with mature closed canopy forest during winter (Perrine 2005). They seek rest areas during the day in areas with low herbaceous cover within closed conifer forests (*Id.*). Fox avoided forest openings of canopy cover less than 40% (Benson et al. 2005). Sierra Nevada red fox diet consists primarily mammals, and they may depend on gophers because typical prey species, rabbits and hares, may be displaced, at least in the Lassen area (*Id.*). Coyote may restrict Sierra Nevada red fox at mid elevations in otherwise suitable habitat, and areas without coyote are red fox refugia (Perrine 2005).

Roads and snowmobile tracks pull coyote and non-native red fox in deep snow areas that fox use as refugia from these animals. Roads also expose fox to dangerous impacts from humans including habituation to human food, vehicle collisions and dog attacks, which killed one fox in the Lassen area (Perrine et al. 2010). Snowmobiles are considered a potential threat and source

of disturbance and source of mortality for Sierra Nevada red fox (USFWS 2015a, p. 61002). The USFWS identified significant threats for Sonora Pass sighting area, which include: small, declining and isolated population; hybridization with non-native red fox and inbreeding evident; loss of genetic diversity; range contraction; reproduction deficiency (inbreeding depression likely); hybrids were only evidence of reproduction in population 2011-2014 (*Id.*).

The Sierra, Sequoia and Inyo forest plans BE do not include any of this recent information, and appears to be years out of date. The BE analysis includes an assumption that the Sierra Nevada red fox is not being invaded by non-native red fox, which is incorrect (p.58) (see USFWS 2015a). Furthermore, the DEIS threats analysis is incomplete, which likely contributed to the lack of species-targeted plan components aimed at addressing ecological integrity of SN red fox habitat, and the conditions necessary to maintain viable populations of the fox in the plan area, as described in more detail below.

2. The Proposed Forest Plans are Inadequate to Provide Ecological Conditions Necessary for Sierra Nevada Red Fox Persistence in the Plan Area

According to the DEIS, ***"****the most serious stressors impacting the Sierra Nevada distinct population segment at this time include small population size and isolation, hybridization with non-native red fox, climate change, and competition and predation from coyotes."* (DEIS p.339). The USFWS considers snowmobiles a potential threat and source of disturbance and source of mortality for Sierra Nevada red fox (USFWS 2015a, p. 61002). Researchers have identified recreation in general as a threat (Perrine et al. 2010), because of its intolerance of humans:

> The Cascade and Sierra Nevada red fox populations are at the greatest risk of extinction; both appear to be small and in decline. The Sierra Nevada red fox has been considered extremely sensitive to the presence of humans (Grinnell et al. 1937) so that increased recreation within its range could be problematic (Buskirk and Zielinski 2003, p. 210).

There are no plan components that mention or address these threats to SN red fox. The proposed plan components do not address population isolation, alpine and subalpine habitat connectivity, or how to manage grazing, recreation and road use or how these activities can avoid contributing to further disturbance, vulnerability to predation, population isolation, and possible inbreeding depression. Thus the plans themselves do not provide ecological conditions necessary to maintain a viable population of each species of conservation concern within the plan area, as required in the planning rule.

The Forest Service does not offer any desired conditions that target specific ecological requirements or threats to the SN red fox. There are desired conditions that identify need to contribute to terrestrial species sustainability in general.

Another issue with habitat management for Sierra Nevada red fox in the plans is that the SNF, SQF and INF plans emphasize mechanical treatments along ridgetops in upper montane zone, which would impact marten and Sierra Nevada red fox (p. 382-4). At the same time, there is a

plan component to *"Avoid or remediate habitat modification that unnaturally increase marten susceptibility to predation."* (DEIS, p. 84). There is a conflict between *"Emphasize vegetation treatments in focus landscapes (10,000-80,000 acres) to move terrestrial ecosystems toward desired conditions and increase resilience of old forest habitat, while limiting impacts to California spotted owl, fisher and marten."* (DEIS, p. 384). Furthermore, the proposed focus area landscape desired conditions with low canopy cover in red fir and Jeffery pine vegetation types is too low (as low as 20% Sierra draft plan, p. 23) to provide habitat for the Sierra Nevada red fox, contrary to SPEC-FW-DC 01, 02, and 03 to provide for the survival and recovery of listed species, and to provide for the *"long term sustainability of plant and animal communities."*

The purpose of desired conditions listed for all alternatives is to improve ecosystem resilience climate change, and other stressors *"in order to support the long-term sustainability of plant and animal communities."* The Forest Service also identifies the desired condition "*Habitats for at-risk species support self-sustaining populations at-risk species*," yet how this translates to Sierra Nevada red fox habitat such as sub-alpine meadows and red fir and lodgepole pine cover during winter is not specified, and no plan components are offered to translate broad desired conditions into specific management direction aimed at this species. Therefore, the Forest Service does not ensure ecological conditions sustainable for the species, as required under NFMA.

The DEIS lists plan components that address threats to species of conservation concern, habitat integrity, sustainability, and species persistence on Table 83 (DEIS p. 350). Plan components for SN red fox include TERR_OLD-GDL 3, 4, 5, and TERR-FW-GDL 5, however these plan components are missing from any draft forest plan. Thus, according to the Forest Service's own analysis, plan components to ensure species sustainability and persistence are not being provided in the plans.

3. The Forest Service Overstates the Fish and Wildlife Service's Estimate of Wildfire Threat to Sub-Alpine Fox

The DEIS identifies threats to Sierra Nevada red fox summarized in a recent USFWS species report (2015b). The DEIS claims the USFWS identified wildfire as a threat to the species. However, the 2015 species report by USFWS (2015b) says the overall impact of fire is *low*, "resulting in minor amount of habitat impacts currently or in the future."
The USFWS identified the following threats as medium stressors *"impacting Sierra Nevada at the population level currently or in the future"*: small population size, hybridization, and competition with coyotes. Climate change was also identified by USFWS as a medium stressor, in that it contributes to coyote access to high elevation areas. The DEIS account of threats to Sierra Nevada red fox shows USFS agency's bias toward blaming fire and proposing accelerated logging as a solution to almost any management challenge. Furthermore, the agency does not recognize or provide analysis of the contribution of wildfire in moving habitat toward NRV.

4. The DEIS Does Not Adequately Disclose Impacts on the Sierra Nevada Red Fox

a. Effects Determination Statements

The proposed Sierra, Sequoia and Inyo forest plans DEIS and BE are missing effects analysis and effects determination for Sierra Nevada red fox, contrary to NEPA. The BE impacts analysis refers to marten, but not SN red fox (p. 58-59). Even the effects determination refers to marten, not SN red fox (p. 59). Using "cut and paste" for individual species' effects determinations is a far cry from NEPA's standard to take a "hard look" at impacts to species from agency activities. The forest plan analysis is also missing any cumulative effects analysis for SN red fox. The BE incorrectly states that *"future actions would be considered will be addressed in the specific project level NEPA"* (p. 59). This is incorrect, NEPA requires disclosure and analysis of the effects to species from forest plans in the DEIS and FEIS for the plans, not in future projects that tier to the plans. A complete effects analysis and determination of effects for SN red fox is missing, leaving the decision maker and the public uninformed.

Furthermore, the Forest Service attempts to tier the effects analysis to the 2004 forest plan analysis, instead of providing a current analysis for Alternative A. This is insufficient because at the very least, the affected environment has changed since 2004. Popularity of Over Snow Vehicles (OSVs) has increased, and climate change has drastically changed the southern Sierra forests compared to 2004. The southern Sierra forest plans must account for these differences in the impact analysis of alternative A on the Sierra Nevada red fox.

b. Limited Operating Period Removed

We are also concerned that the effects of eliminating the 2004 forest plan requirement for a SN red fox LOP is not disclosed. The 2004 Sierra Nevada Forest Plan requires forests to: "*analyze all potential management impacts to Sierra Nevada red fox and apply a limited operating period [LOP] from January 1 to June 30 to avoid adverse impacts to potential breeding.*" This standard applies to all 11 National Forests in the Sierra Nevada. Further, the 2004 Forest Plan directs forests to "*Evaluate activities for a 2-year period for detections not associated with a den site.*" (2004 ROD p. 54). Newly proposed forest plan impacts to den site locations are not discussed in relation to this requirement being dropped from the proposed plans. In addition, no alternative is offered which seeks to comply with S&G #32 for issuing an LOP on projects near den sites, and none of the alternatives minimize disturbance to Sierra Nevada red fox.

c. Climate Change, Recreation, Cumulative Effects

The DEIS does not disclose how the plans may amplify risk factors for the Sierra Nevada red fox. The agency did not address how camping, cars, or OSV use might contribute to Sierra Nevada red fox vulnerability to coyotes in the winter, or how these activities might contribute to population isolation, and inbreeding depression faced by the fox. All of these factors are identified in the conservation assessment for the fox (Perrine et al. 2010), and the USFWS 12-month finding (2015a). Because fox eat small mammals (Perrine 2005), grazing is also likely to

have an impact on the fox through impacts to its prey species, however grazing impacts on the fox were not mentioned in the DEIS, either.

The fox at the Sonora Pass sighting area stay at high elevation through winter (9,100+ ft.) (Statham et al. 2012). This species already appears to be at highest elevation range possible, so climate change impacts will be larger in locations like these (USFWS 2015b). Climate change is likely to reduce boreal, rock land and ice field habitats by at least 50% above 2,750m (9,000 ft.) over the next 85 years. Warming temperatures could give coyotes, bobcats and lowland red foxes access to habitat currently occupied by Sierra Nevada red fox, increasing risk of competition, predation and disease transmission (USFWS 2015b).

Habitat connectivity for sub-alpine species is a key concern with climate change (Lenihan et al. 2008). The fox is already threatened by small, isolated populations and USFWS has already identified population isolation as a concern, in addition to climate change. The forest plans' DEIS does not acknowledge how disturbance from recreation can intensify threats and further reduce habitat connectivity or refugia from predators for SN red fox under changing climate scenarios. For example, snowmobile activity accelerates impacts of climate change on Sierra Nevada red fox by increasing coyote incursion into deep snow refugia during heavy precipitation years. The agency must disclose these impacts, as well as disclose if alternatives were considered, including targeted plan components that would address these impacts.

The USFS should carefully consider how allowing widespread OSV use in occupied marten habitat and unsurveyed habitat for Sierra Nevada red fox may act synergistically with climate change to compromise winter habitat in deep snow years and to endanger these species. In deep snow years, coyote incursion into red fox habitats is slowed temporarily. However, if OSV trails and compaction in SN red fox winter range compromises or even eliminates this deep snow barrier, then OSV use may enhance and accelerate the negative impacts of climate change for SN red fox and Sierra marten. Climate change and reduced snowpack should also be part of the environmental baseline and inform the analysis of direct, indirect, and cumulative impacts.

5. The Effects Analysis for Sierra Nevada Red Fox Does Not Use Best Available Science

The BE is outdated, and did not even recognize the Sonora Pass subpopulation or the USFWS species report analysis or the 12-month finding published in 2015. Although the DEIS does acknowledge this new information, the determination of effects of the plans are based on a very obviously outdated report. For example, the BE goes on: "The only population known to exist in recent times is found in Lassen NP and the surrounding Lassen NF." (p.54). Further, the BE states that Sierra Nevada red fox migrate seasonally, which is now hypothesized to be a failed dispersal attempt by the Lassen population, not a migration, since the Sonora Pass population does not migrate (Stratham at al. 2012). However, this and other important biological information about this species is missing from the BE. At another point in the BE, the assertion is made that the range of the Sierra Nevada is not being invaded by non-native red fox. This is not true either, as demonstrated by Sacks et al. (2015) where non-native red fox have been documented invading and breeding with native fox in the Sonora Pass sighting area. Genetic inbreeding is also a major concern with both Sierra Nevada red fox subpopulations.

Another omission of best available science is recent evidence that Sierra Nevada red fox has tested positive for anticoagulant rodenticides known to have huge impact on rare wildlife in Southern Sierra Nevada such as fisher, other mammals, as well as many threatened birds (Thompson et al. 2013). The BE mentions strychnine, but not d-con (active ingredients are brodifacoum or diphacinone) that is the culprit of the above-mentioned poisoning crisis on the Sierra and Sequoia National Forests. Although the use of this poison is now under new regulation, a roadkill fox found on highway 395 in 2012 did test positive for anticoagulant rodenticides. The repercussions of misuse of this poison across the Sierra Nevada may still be affecting the species today.

6. Wolverine

The wolverine is a Forest Service sensitive species in Region 5 (USDA Forest Service 2016a). The species was not identified as a species of conservation concern (SCC), despite the fact that the planning area is within the species historic range, and CDFW is considering reintroduction to the Sierra Nevada (C. Stermer, personal communication July 28, 2016), and the presence of at least 1 wolverine in the Sierra Nevada for at least 7 years. The Forest Service violates the planning rule by failing to provide any rationale at all for not identifying the wolverine as an SCC from the Sierra, Sequoia and Inyo National Forests, and ignores best available scientific information that warrants continued protection of this wide-ranging species throughout its range in the Sierra Nevada (Aubry 2007, USFWS 2008).

7. Additional Recommendations

In addition to the recommendations provided thus far, we recommend the following.

The plan components that the DEIS uses to demonstrate providing habitat integrity, sustainability and species persistence in Table 83 and that are missing from the draft forest plans should be added to them.

Plan components requiring surveys, LOPs, providing for habitat connectivity, protection from disturbance from snowmobiles and winter recreation, camping and roads, should be incorporated into the revised plans. all need to be developed.

Assume that Sierra Nevada red fox occurs in all areas modeled as suitable habitat (e.g., by Cleve 2009),

Providing canopy cover helps provide cover from predators, but plan components providing for this need to be bolstered. Use the recommendations in Britting et al. (2012) that we submitted in scoping to develop additional management recommendations for old forest species including SN red fox and these are incorporated by reference here.

M. Amphibians Affected by Grazing Management and Livestock Impacts

Our comments on the at-risk amphibians are provided in two sections. This section focuses on all

of the at-risk amphibians affected by grazing. Section N is specific to Yosemite toad management.

The national forests within the Sierra Nevada contain a very unique group of native amphibian species that historically inhabited a wide variety of aquatic and terrestrial habitats. Due to various historical and contemporary factors, several of the region's native amphibian populations are in a sharp decline and are fragmented within their historic range. Historical causes of amphibian decline cannot be undone, but current risk factors directly related to forest activities on National Forests can be conducted in such a way to protect the viability of federally listed amphibians including Sierra Nevada yellow-legged frog (*Rana sierra*), northern distinct population segment of the mountain yellow-legged frog (*Rana muscosa*) and Yosemite toad (*Anaxyrus canorus*). Climate change, drought, ultraviolet radiation, airborne pollution, pathogens, and land management practices including livestock grazing, recreational activities, and introduction of non-native fish, are some of the many factors that potentially affect federally listed amphibians in the Sierra Nevada (Brown et al., 2014; Brown et al., 2015; USFWS 2014).

In order to effectively protect federally listed and other at-risk amphibian species within Forest boundaries, it is imperative to understand current population trends, location of occupied and potential critical habitat areas, and how activities such as grazing may impact them. As an example, the Sierra National Forest at one time was estimated to have nearly 12,500 acres of suitable meadow habitat for the threatened Yosemite toad on the 1.4 million acre forest (3 percent of all acres), and 80 percent of the allotments were estimated to contain toad occupied habitat and/or potential suitable habitat for Yosemite toad (Eddinger 2002). Within each of the 34 allotments, 0.1 to 4.3 percent of the total allotment area was thought to have potential suitable meadow habitat, which does not include other potential suitable habitat in other aquatic ecosystems like lake shores, ponds, and streams (Eddinger 2002). This demonstrates how critical it is to preserve and protect habitat for at-risk amphibians from degradation within the three forests.

Biologists and environmental associates working for the Central Sierra Environmental Resource Center (CSERC) were amongst the first to identify specific habitat sites on national forest lands in the Sierra Nevada region for the Yosemite toad and the Sierra Nevada yellow-legged frog when Region 5 acknowledged the need to assess their declining status. Over the past 15 years, CSERC biologists have spent hundreds of days on national forest lands of the central region of the Sierra Nevada -- monitoring meadows and riparian habitat, as well as observing amphibian species. CSERC staff have also spent an even longer period of time doing forest fieldwork and monitoring of the biological effects of livestock grazing, sloughing, chiseling, and contamination of forest streams on national forest land. Based on those many years of persistent monitoring, CSERC has repeatedly raised concern at the Regional level over the resource degradation and water quality contamination that range management causes on national forest lands in the Sierra Nevada region.

1. The Draft Plans Do Not Provide Clear and Concise Objectives or Necessary Standards and Guidelines for the Protection and Viability of At-Risk Amphibians and Their Habitat.

In particular, the three Forest Plans fail to provide adequate protection for amphibians that face habitat degradation or direct risk from livestock grazing (range management) within the three forests.

The forest plan direction in this revision, in terms of addressing the requirements to preserve and manage for federally listed amphibians including Sierra Nevada yellow-legged frog (Inyo and Sierra), northern distinct population segment of the mountain yellow-legged frog (Inyo and Sequoia) and Yosemite toad (Inyo and Sierra), is inadequate and illegal as it currently stands. Generally, the draft forest plans for the three forests state that project strategies and program activities should protect or at least take into consideration at-risk species. However, with the exception of two weak guidelines put forth in the Sierra NF Draft Forest Plans for Yosemite toad (SPEC-YT-GDL-01, -02), there are no specific objectives, standards, or guidelines provided to provide management direction for listed or at-risk amphibian species or to provide protection for their specific critical habitats within the three forests.

2. The Forest Service is Under Legal Obligation to Put Forth Forest Plan Guidance for Managing and Protecting At-Risk Species (Such as Amphibians) from Actions Allowed by a Forest Plan

The Forest Service is under legal obligation to put forth Forest Plan guidance for managing and protecting at-risk species (such as amphibians) and their critical habitat designations, and must provide Forest Plan direction as to how significant negative effects from approved projects and actions will be minimized or altered in order to increase the viability of at-risk amphibian populations and their critical habitat. Alternative B does contain general wording supporting active restoration of a fairly limited amount of acreage within riparian areas, meadows and other aquatic habitats, which has some benefit. But as the draft forest plans are currently written, there is no forest-wide programmatic direction or any standards or guidelines that will assure protection from livestock grazing impacts for critical habitat for any at-risk aquatic species. Language in the plans needs to specify the current condition, potential management activities, and the at-risk species presence/absence for each specific habitat proposed to be restored.

According to the 2014 Programmatic Biological Opinion, in addition to factors outside of the control of the FS (such as climate change, drought and disease), many forest program activities that are under USFS oversight can directly lead to mortality, injury or harassment of individual Sierra Nevada yellow-legged frogs, mountain yellow-legged frogs, and Yosemite toads, or negatively affect their habitat through hydrology alteration, soil disturbance, stream bank disturbance, or vegetation removal.

Such program activities include range, roads, trails, pack stock, recreational activities, timber harvest, mining, invasive species management, certain activities under special use permits, and real estate. One activity in particular -- range management -- allows livestock to move at will across tens of thousands of acres of forest lands on a national forest including extensive acres

where at-risk amphibian species are vulnerable to direct and indirect disturbance. Livestock grazing not only has potential to negatively affect listed amphibian populations on national forests in the Sierra Nevada, it has been proven to cause such impacts. Accordingly, the USFWS (2014) considers grazing to have moderate impacts to the federally listed Yosemite toad, and under their ruling the "unauthorized modification of the mountain meadow habitats or associated upland areas important for breeding, rearing and survival of these species" could result in a direct violation of the USFWS final rule document.

It is also notable that there is no mention within the draft forest plans as to how there will be essential protection for other at-risk amphibian species in addition to the three federally listed amphibians, and there are numerous other amphibians in need of protection. The other amphibians that are deemed to be at-risk, or species of conservation concern, inhabit a wide range of aquatic and terrestrial habitats across the three forests and may also be impacted by various forest activities. The species include foothill yellow-legged frog (Sierra, Sequoia), black toad (Inyo), Fairview slender salamander (Sequoia), Hell Hollow slender salamander (Sierra), gregarious slender salamander (Sierra, Sequoia), Inyo Mountain salamander (Inyo), Kern Canyon slender salamander (Sequoia), Kern Plateau salamander (Inyo), Kings River slender salamander (Sierra, Sequoia), limestone salamander (Sierra), Owens Valley web-toed salamander (Inyo), and relictual slender salamander (Sequoia).

It is especially troubling and alarming that the Forest Service admits in the EIS that "population status is uncertain" for all of the at-risk terrestrial salamanders on the three forests, but then the agency also makes the claim "habitat was not found to be a limiting factor for any of these species…" (EIS, page 340). Obviously, a wet microhabitat is essential for the salamanders at various life stages, and under a warming, drying climate such habitat may be limited compared to historic conditions. Similarly, the foothill yellow-legged frog is considered to be in significant decline across its historic range and highly vulnerable to the cumulative impacts of climate change combined with the chytrid fungus, degradation of habitat, negative effects from hydroelectric river management, and other impacts. Therefore, it is problematic that there are no objectives, standards and guidelines for other at-risk aquatic and terrestrial amphibians. This deficiency should be corrected in the FEIS and final Forest Plan(s).

3. Direction in the Draft Forest Plans Does Not Provide for the Protection of At-Risk Amphibian Species

The comments below address individual objectives, standards or guidelines in the draft forest plans that include inadequate or nebulous objectives, standards, or guidelines, or identify where the draft forest plans fail to contain any appropriate objectives, standards or guidelines all together, in terms of at-risk amphibians.

Critical Aquatic Refuge Desired Conditions

- Sierra NF MA-CAR-DC-01 and -03 (Sierra Draft Forest Plan, p. 65): There is no mention of proposed critical aquatic refuge designations based on the needs of any listed or at-risk amphibians. The Forest Service should carefully assess where federally listed amphibians' critical aquatic habitats are located on the Sierra NF, and ensure that the Forest's critical

aquatic refuges encompass critical habitat areas for federally listed amphibians. This would include meadows with sufficient shallow-water breeding pool hydroperiods for Yosemite toad, and lakes, ponds, meadows and streams with sufficient perennial waters to meet the needs of various developmental stages of Sierra Nevada yellow-legged frog (USFWS 2014).

- Sequoia NF MA-CAR-DC-01 and -03 (Sequoia Draft Forest Plan, p. 65): There is no mention of proposed critical aquatic refuges designations based on the needs of any listed or at-risk amphibians. Therefore, the Forest Service should define where federally listed amphibian's critical aquatic habitats are located on the Sequoia NF, and that the Forest's critical aquatic refuges encompass critical habitat areas for federally listed amphibians. In the case of the Sequoia National Forest, that should include "very high elevation lakes" for the mountain yellow-legged frog (Sequoia NF Assessment, page 93). Since key ecological conditions needed to support the frog at lower elevations include fishless streams (Sequoia NF Assessment, page 93), there should be clear standards and guidelines in the Forest Plans specifically for managing mountain yellow-legged frog critical habitat in high elevation lakes and lower elevation fishless streams.

- Inyo NF MA-CAR-DC-01 and -03 (Inyo Draft Forest Plan, p. 65): Similar to the concern raised above for the other two national forests, for the Inyo there is no mention of proposed critical aquatic refuges designations based on the needs of any listed or at-risk amphibians. Therefore, the Forest Service should assess where federally listed amphibians' critical aquatic habitats are located on the Inyo NF, and ensure that the forest's critical aquatic refuges encompass critical habitat areas for federally listed amphibians, including Sierra Nevada yellow-legged frog and Yosemite toad.

Riparian Conservation Areas - Meadows Objectives

- Sierra, Sequoia, and Inyo draft plan objective RCA-MEAD-OBJ-01 state: "Take action to maintain, enhance, or improve conditions on 5 to 10 meadows of any size, within 10 years following plan approval." We ask that the word "maintain" be removed from this objective. Simply maintaining conditions, particularly when there are a number of meadows in satisfactory condition or greater, makes this objective self-fulfilling and meaningless.

  We believe the Forest Service should commit to taking action to enhance or improve meadows since these ecosystems provide critical habitat for threatened amphibian species such as the Yosemite toad. Brown et al. (2015) synthesized Yosemite toad research in the Sierra Nevada and demonstrated that the species is at high risk from practices that lead to drying of meadows and a reduction in shallow-water breeding pool hydroperiods. The Forest Service's objective to "to maintain, enhance, or improve conditions" for "5 to 10 meadows of any size" on each of the forests is not a realistic management objective to address forest-wide meadow degradation issues, especially if the goal is to preserve critical Yosemite toad habitat and contribute to the recovery of the species associated with meadows.

  According to the DEIS, the Sierra NF has approximately 15,750 acres of meadow (DEIS, page 405), the Sequoia NF has more than 10,000 acres in meadows (DEIS, p. 268), and the Inyo NF has over 25,000 acres of meadows larger than 1 acre (DEIS, p. 404). Given the

proportionately low number of meadows that would be maintained, enhanced, or improved and that countless meadows are only a few acres, the objectives for these forests could be met by only enhancing or improving a tiny fraction of meadows on these forests. These proposed objectives would, at most, enhance 1% of the total number of meadows over 10 years. Therefore, we recommend RCA-MEAD-OBJ-01 be modified to dramatically increase the amount of meadow habitat to be improved and the number of meadow-acres for which conditions will be improved should also be defined to provide a true management target.

Watershed Conditions Standards

- Sierra NF WTR-FW-STD-02 (Sierra Draft Forest Plan, p. 91): We recommend that the standard include consideration of at-risk amphibians that use streams and adjacent riparian habitats for various life stages within the Sierra NF including Sierra Nevada yellow-legged frog, foothill yellow-legged frog and Yosemite toad. Sierra NF's Assessment and USFWS (2014) both state that perennial water bodies is critical for the viability of Sierra Nevada yellow-legged frog. Therefore, the standard should include explicit water quantity and quality requirements for areas where at-risk amphibians are present.

Range Standards

- Sierra NF RANG-FW-STD-01 (Sierra Draft Forest Plan, p. 93), Sequoia NF RANG-FW-STD-01 (Sequoia Draft Forest Plan, page 94), Inyo NF Appendix F, page 173: Willow browsing by livestock can have direct impacts to critical habitat for at-risk amphibians and other species. Willows have shown to provide critical protection and cover for Yosemite toad metamorphs (Martin 2008), and also provide stream cover for Sierra Nevada yellow-legged frog tadpoles. The Forest Plan direction for willow browse by livestock should be mandated to be actively monitored by the Forest in representative transect locations within each allotment, especially in critical amphibian habitat in order to keep willow browse by livestock below 20 percent of annual growth.

- Sierra NF RANG-FW-STD-07 (Sierra Draft Forest Plan, p. 94), Inyo NF Appendix F, page 172: For meadows in unsatisfactory condition the standard proposed would limit utilization of grass and grass-like plants to a maximum of 30 percent. If a meadow is in unsatisfactory condition, even 30 percent utilization is too high. Elsewhere in the draft revised plan (page 63) standard 16 direction already requires that degraded meadows in early seral stage status with 10%+ bare soil be totally rested from grazing until they have moved to mid- or later-seral status. That standard for grazing utilization in riparian areas and meadows with unsatisfactory condition requires exclusion, rather than just a slight reduction from 40% utilization to 30%. In order to contribute to species recovery, we strongly urge that the proposal to allow 30% utilization in meadows in unsatisfactory condition be removed and that such meadows be required to have grazing exclusion until they have moved to at least mid-seral status. Meadow grasses provide important habitat for Yosemite toad and Sierra Nevada yellow-legged frog. The 2014 Programmatic Biological Opinion cites several published papers that suggest reduced vegetation height due to livestock grazing in meadows habitats, alters toad use of that habitat (Martin 2008).

Range Guidelines

- Sierra NF RANG-FW-GDL-02 (Sierra Draft Forest Plan, page 103): Not only should stock travel ways "be maintained in usable conditions," but it is important that the Forest Service also monitor and evaluate impacts of stock travel ways on federally listed or at-risk amphibians. According to the 2014 Programmatic Biological Opinion, any forest program activities, including pack stock, directly causing mortality, harm or harassment to listed frog or toad must be stopped. Years of field monitoring by CSERC have demonstrated direct impacts of livestock and pack stock travel ways intersecting with important breeding habitat for threatened Yosemite toads (see picture below). The photo below shows pocking from stock traveling in and around a small, shallow pool filled with Yosemite toad tadpoles in a meadow near an established trail. In addition, Inyo and Sequoia NF should have language requiring monitoring of stock trails or travel ways upon listed species.

- Sierra NF RANG-FW-GDL-03 (Sierra Draft Forest Plan, page 103): If the Forest Service deems "domestic livestock should be managed to meet wildlife needs in identified important wildlife habitat areas," then livestock should not disturb or negatively impact meadows, lake and pond shores or stream banks where Sierra Nevada yellow-legged frog or Yosemite toad habitat occurs. The guideline should include language for how the Forest Service proposes to minimize disturbance in critical habitat of listed amphibians. The Inyo and Sequoia national forests should have similar guidelines.

Animal and Plant Species Standards

- Sequoia NF SPEC-FW-STD and Guideline SPEC-FW-GDL (Sequoia Draft Forest Plan, page 92, 98): It is a significant deficiency that there are no specific standards and guidelines for federally listed mountain yellow-legged frog in the Sequoia NF Draft Forest Plan. According to the Sequoia NF Assessment (page 93), mountain yellow-legged frogs were "extirpated from meadow and stream habitats between 5,000-6,000 feet" and current proposed critical habitat areas are within very high elevation lakes on the forest. The Assessment also lists known risk factors to the species including introduced fish, disease, climate change, and population fragmentation (page 93). Excluding factors outside of the

control of the managing agency, such as climate change, drought and disease, the Sequoia Forest Plan should put forth clear standards and guidelines for managing and protecting mountain yellow-legged frogs and their habitat. There should be clear Forest Plan direction as to how forest practices will either be minimized or altered (e.g., population fragmentation due to degraded or loss of habitats), or how conditions will be restored (e.g. remove introduced fish from lakes) in order to increase the viability of the mountain yellow-legged frog population.

- Inyo NF SPEC-FW-STD and SPEC-FW-GDL (Inyo Draft Forest Plan, page 97, 103): Similar to the legal deficiency described above, there are no specific standard and guidelines for the federally listed mountain yellow-legged frog, the Sierra Nevada yellow-legged frog, or the Yosemite toad in the Inyo NF Draft Forest Plan. According to the Inyo NF Assessment, the historic range for the mountain yellow-legged frog included "side channels, spring pools, pond habitat and possibly backwater ponds created by beaver dams in areas separated from fish habitat" on the Kern Plateau, though currently, populations of the species are restricted to smalls areas in Bullfrog Meadow and Mulkey Meadows on the Inyo NF (Inyo NF Assessment page 87). In addition, not only do introduced trout and disease negatively affect amphibian populations on the forest, but there are also "unknown levels of impact from historic and current forest practices including recreation, agriculture and grazing" (Inyo NF Assessment page 45). Excluding factors outside of the control of the managing agency, like climate change, drought and disease, the Inyo Draft Forest Plan does not put forth clear standards and guidelines for managing and protecting mountain yellow-legged frogs and their habitat. Nor is there Forest Plan direction as to how forest practices will either be minimized or altered (e.g., potentially altering recreation and grazing), or conditions will be restored (e.g. remove introduced fish from lakes) in order to increase the viability of the amphibian population. In addition, our Center urges that there be developed very clear, enforceable standards and guidelines in the Inyo Forest Plan specifically for managing populations of Sierra Nevada yellow-legged frogs, which have an estimated 29 population centers left on the forest (Inyo Assessment page 88), and Yosemite toads, which have an estimated 22 occupied sites left on the forest (Inyo Assessment page 89).

Animal and Plant Species Guidelines

- Sequoia NF SPEC-FW-GDL-06 (Sequoia Draft Forest Plan, page 98): It is positive for the Sequoia draft Forest Plan to contain forest direction that water diversions or wells or any other "water development" should be "avoided near streams or seeps and springs where there is high risk of dewatering aquatic habitats where species of conservation concern occur" such as mountain yellow-legged frog or foothill yellow-legged frog, as examples of amphibian species of concern that may be affected by dewatering aquatic habitats.

- There should be a guideline for Sierra Nevada yellow-legged frog occupied habitat that overlaps with grazing activities. We urge the Forest to develop a specific standard and guideline for Sierra Nevada yellow-legged frog under the "Forest-wide Animal and Plant Species" section in the draft forest plan. Tied to that standard, the Forest Plan should require forest-wide surveys and monitoring to determine where yellow-legged frog occupied habitat overlaps with grazing activities. The photos below depict a riparian area just upstream of a

known Sierra Nevada yellow-legged frog occupied meadow, where livestock was actively grazing at the time of the photo and where an individual Sierra Nevada yellow-legged frog adult was found. The frog is located within the orange circle toward the middle of the top photo, and the photo below is a close-up of the frog.

4. Direction in the Forest Plans Should Include Specific Standards and Guidelines to Better Protect Amphibians from Range Impacts

Below are specific recommended standards proposed to enhance or replace the existing standards and guidelines in order to better protect the viability of at-risk amphibians populations and their critical habitat on the three forests.

Recommended Standard or Guideline 1. All potential habitat within the known range of the three federally listed amphibians including high-elevation perennial streams, intermittent streams, ephemeral streams, stream side channels, lake shores, ponds, pools, springs and seeps should be considered occupied by these species until surveys U.S. Fish and Wildlife Service-approved surveys have been complete.

Rationale: Habitat requirements for the various life-stages of Sierra Nevada yellow-legged frog, mountain yellow-legged frog, and Yosemite toad are complex and require various micro-habitats within both aquatic and terrestrial ecosystems. For example, the Sierra Nevada yellow-legged frog and mountain yellow-legged frog require shallow aquatic habitat for egg development, permanent waters for multi-year tadpole development, diverse aquatic habitat for feeding and refuge during the active season for adults and subadults, and deep water for over winter hibernation for adults, subadults and tadpoles (Brown et al. 2014). Yosemite toads require shallow waters for egg and tadpole development, shallow water vegetation refuge for metamorphs, and upland terrestrial habitat for later stages in the active-season and overwintering (Brown et al. 2015). These factors need to be considered when determining the extent of species' critical habitat.

Recommended Standard or Guideline 2. Regular monitoring of federally listed amphibians will occur within each allotment occupied by listed amphibians. In coordination with the U.S. Fish and Wildlife Service, forest biologists and specialists will determine the number of monitoring sites, site locations and monitoring frequency. Habitat conditions to be monitored may include, but are not limited to, hydrology, vegetative cover, soil characteristics, and/or prey communities.

Rationale: With listed species potentially threatened by a variety of effects, the Forest Service can only control limited factors. One important factor is the status and health of habitat conditions needed by the listed amphibians.

Recommended Standard or Guideline 3. Regular monitoring of amphibian occupancy and other information pertaining to population dynamics will occur on the three forests. Forest biologists and specialists will determine the suitable number of monitoring sites, site locations and monitoring frequency. Population metrics may include, but are not limited to, relative abundance, relative densities, survival rates, sex ratios, age structure, recolonization rates, or incidences of local extirpation.

Rationale**:** Population isolation due to habitat fragmentation, and decreasing population size due to various risk factors makes it imperative that population dynamics metrics are measured for listed amphibians within each forest. In addition, more information is needed to better understand whether populations of these listed amphibians operate as meta-populations (e.g. viability related to a balance between extinction colonization among connected sub-populations across the landscape; Brown et al. 2014; Brown et al. 2015). This information would give managers a better understanding of how to go about managing these species.

Recommended Standard or Guideline 4. Management actions will be taken to remove sources of significant disturbance to meadows, whether the disturbance is caused by permitted livestock or other management activities occurring in meadows occupied by federally listed amphibians or in meadows that are in unsatisfactory condition. Actions to remove the meadow disturbance should include treatments such as exclusion of livestock or motor vehicles through fencing, actively herding livestock away from occupied areas, or trail reconstruction to bypass meadows.

Rationale: Forest program activities can directly alter habitat through stream bank trampling, decreased plant cover refuge (increased bare soil), soil compaction, premature drying of water bodies, down-cutting, lowering water table, increased stream sedimentation, and impacts to water quality and increased water pollution (Brown et al. 2014).

Recommended Standard or Guideline 5: If the Forest Service decides to waive livestock exclusion standards where there is a specific management plan in place for an individual site with a federally listed amphibian species present, then within that plan the Forest Service shall agree to measure multiple indicators of population health to ensure the adequacy of the management plan.

Rationale: If forest-wide standards are waived, there should be appropriate assessment to determine if the waiver adequately protects the site or if the waiver resulted in degradation of critical habitat, negatively affected the population, or resulted in direct harm to the amphibians.

Recommended Standard or Guideline 6: Willow browse by livestock should be actively monitored in representative transect locations within each allotment and also in critical habitat for listed amphibians in order to ensure that browsing by livestock does not exceed the standard.

Rationale**:** Setting a browse threshold without tying the threshold to at least a minimal level of monitoring would make any threshold less likely to be enforced.

Recommended Standard or Guideline 7: Meadows in unsatisfactory condition are to be excluded from livestock grazing and/or pack stock grazing until the meadows have recovered.

Rationale: Meadow grasses provide important habitat for listed amphibians. The 2014 Programmatic Biological Opinion cites published papers that suggest reduced vegetation height due to livestock grazing in meadows habitats alters toad use of that habitat (Martin 2008). If a meadow is in unsatisfactory condition, even 30 percent utilization is too high. Elsewhere in the draft revised plan (page 63) standard 16 direction already requires that degraded meadows in early seral stage status with 10%+ bare soil be totally rested from grazing until they have moved to mid- or later-seral status. That standard for grazing utilization in riparian areas and meadows with unsatisfactory condition requires exclusion, rather than just a slight reduction from 40% utilization to 30%.

N. Yosemite Toad

The effects of grazing on the Yosemite toad and its habitat are well established in the 2014 listing rule (Service 2014) and 2014 Programmatic Biological Opinion issued to the Forest Service. These documents define cases of cows killing Yosemite toads and cite numerous studies that found that historical and contemporary cattle grazing of montane meadows and streams can have significant adverse effects on meadow and stream hydrology and other important habitat components. In reference to the effects of grazing on Yosemite toad, the listing rule (Service 2014, page 152, emphasis added) concludes that:

> "We consider this threat prevalent with moderate impacts to the Yosemite toad and **a potential limiting factor in population recovery range-wide**. In addition, given the potential for negative impacts from heavy use, and the vulnerability of toad habitat should grazing management practices change with new management plans, we expect this threat to continue into the future."

Due to the documented adverse effects of grazing to the species and its habitat, current plan direction includes Standards and Guidelines 53, 54, and 55 to attempt to mitigate the adverse effects of grazing on the species.

1. Subtle Changes to Current Plan Direction Result in Significant Effects to Yosemite Toad that Have not Been Analyzed in the DEIS

Several significant changes have been made to current plan direction specific to grazing management in Yosemite toad habitat that have not been disclosed or analyzed in the DEIS. First, Alternatives A and B provide that livestock will be excluded from areas occupied or used by Yosemite toad during the breeding and rearing season, except in cases where a site-specific management plan has been developed for the occupied area in question. However, Alternative B (SPEC-YL-GLD-2, Sierra LRMP, page 98) proposes that the site-specific management plan may allow for grazing to simply "adhere and comply with forest plan grazing related standards and guidelines and best management practices." While there was no plan direction on the site-specific management plan in current forest plan, this clarification is counter to the idea that the site-specific plan would be designed to minimize the effects of grazing on the species. It is simply illogical to design a plan for the purpose of minimizing effects and not include any measures that minimize effects beyond what is already required.

There is no direction in the draft forest plans defining how and to what extent the site-specific plan should minimize the effects of grazing to Yosemite toad. As such, SPEC-YT-GLD-2 is not only an indefinable and intangible mitigation measure, it simply allows avoidance of the guideline anywhere Yosemite toads occurs, for any reason, and may allow for significant effects to occur. The DEIS must include an analysis of the effects of the proposed changes to SPEC-YT-GLD-2 and must discuss the probability that SPEC-YT-GLD-1 may never be implemented across the landscape. The DEIS must also analyze the effects of SPEC-YT-GLD-2 vs. SPEC-YT-GLD-1 on Yosemite toad. It cannot be assumed that decisions deferred to the project-level will more effectively minimize adverse effects, such an assumption erodes the very foundation of NFMA and suggests that forest planning in general serves only to produce theoretical solutions to complex management issues.

Standard RANG-FW-STD-3 (Sierra LRMP, page 98) also has the potential for negative consequences on Yosemite toad. It provides that, "Where professional judgment and quantifiable measurements find that current practices are maintaining range in good to excellent condition, the grazing utilization standards above may be modified to allow for the Forest Service, in partnership with individual permittees, to rigorously test and evaluate alternative standards." Therefore, when the site-specific management plan afforded in SPEC-YT-GLD-2 provides that grazing in areas occupied by Yosemite toad need only to adhere to range standards and guidelines, grazing utilization standards and grazing intensity may be increased in such areas by RANG-FW-STD-3. As a consequence, the plan allows livestock within areas occupied by Yosemite toad larvae throughout the plan area, and in some cases, allows for utilization standards to be exceeded in such areas. Such a change in forest plan direction is certain to cause detrimental effects to meadow quality and does not ensure species viability or contribute to the recovery of the species. No attempt to analyze the effects of the changes in forest plan direction on Yosemite toad have been made.

Both Alternatives A and B provide that the site-specific management plan must include monitoring habitat conditions and occupancy and population dynamics to determine if changes in management direction should be made. However, SPEC-YT-GLD-2 in the proposed action states,

"The plans are to include a requirement for systematically monitoring a sample of occupied Yosemite toad sites (minimum of one location per allotment) within a meadow to assess habitat conditions and assess Yosemite toad occupancy and population dynamics. Every 3 years from the date of the plan, evaluate monitoring data. Modify or suspend grazing if Yosemite toad conservation is not being accomplished, i.e., monitoring reveals a decline in toad populations is likely attributable to grazing." It is highly improbable that systematic monitoring of habitat conditions and population dynamics from a single location within a meadow could produce data capable of revealing a correlation between the effects of grazing and species decline. It is likely that such a monitoring scheme would require a robust study design that imparts high statistical power, controls, a large sample size, and many years of data collection. The DEIS must provide evidence that the level of monitoring required by SPEC-YL-GLD-2 is likely to reveal effects of grazing. We also ask that the word "occupancy" be removed from this guideline. A change in occupancy would mean the species has been extirpated from the meadow in question. Such a threshold is not appropriate for adaptive management of a threatened species.

According to the scoping notice (page 17): "SNFPA 53, 54, 98 and 114 which are specifically related to the three newly listed federal threatened and endangered amphibian species (Yosemite toad, Sierra Nevada yellow-legged frog and the northern distinct population segment of the mountain yellow-legged frog) would be retained but would incorporate clarifications resulting from consultation with the U.S. Fish and Wildlife Service." We have reviewed the Programmatic Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged Frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged Frog, and Threatened Yosemite Toad (Service File Number FF08ESNF00-2014-F-0557; PBO) and have been unable to determine how the proposed changes to standard and guideline 54 under the current plan direction to SPEC-YL-GLD-2 simply "clarify" the PBO. For the reasons outlined above, the proposed changes to standard and guideline 54 would require the Forest Service to reinitiate consultation with the U.S. Fish and Wildlife Service for changes to the project description that cause effects not considered in the PBO. Therefore, such proposed changes cannot be considered to be mere clarifications to existing plan direction and are therefore outside the purpose and need for forest plan revision.

The DEIS also fails to take a hard look at the effects of grazing under the current forest plan on Yosemite toad habitat quality and species abundance. Although the current forest plan provides some restrictions to grazing in areas occupied by Yosemite toad larva, there are no restrictions to grazing when recently metamorphosed toads active. This issue was cited in the final rule listing the species:

> "Direct and indirect mortality of Yosemite toads has occurred as a result of livestock grazing. Mortality risk from livestock trampling is expected to be the greatest for non-larval stages where livestock concentrate in Yosemite toad habitat when toad densities are highest; early in the season when breeding adults are aggregated and egg masses are laid; and at metamorphosis when juveniles are metamorphosing in mass along aquatic margins. However, because cattle typically are not present during the breeding season, the risk of trampling is expected to be greatest for metamorphs (USFS *et al*. 2009, p. 59). Cattle have

> been observed to trample Yosemite toad metamorphs and subadult toads, and these life stages can fall into deep hoofprints and die (Martin 2008, p. 158). Specifically, Martin (2008, p. 158) witnessed some 60 subadult and metamorph toad deaths during the movement of 25 cattle across a stream channel bordered by willows within a meadow complex. Adult Yosemite toads trampled to death by cattle have also been observed (Martin 2002, pp. 1–3)" (79 FR 24298).

The Forest Service must consider the effects of cattle tramping Yosemite toad metamorphs and subadults in the DEIS to meet NEPA's hard look standard and develop plan components that avoid the effects of trampling in order to meet the planning rule's requirement that forest plans contribute to the recovery of the species.

2. Contribution to Recovery not Demonstrated

As we stated in our scoping comments, it is unclear how the same plan components that were in place for the decade leading up the listing of the species will now contribute to the recovery of the species. The Service (2014, page 152) concluded that grazing is a moderate threat that may preclude the recovery of the species. From this it follows that to contribute to the recovery of the Yosemite toad, the forest plans must include additional plan components to ameliorate the direct and indirect effects of grazing on limiting meadow recovery. Nowhere in the DEIS is an analysis provided as to how the alternatives contribute to the recovery of the Yosemite toad. The only proposed changes to Yosemite toad habitat management allow for livestock to trample toad larvae, with no specific minimization measures to be implemented as part of a site-specific plan, and for increased grazing and increased habitat degradation to occur through increased management flexibility. Suggesting that a flexible approach to grazing management in Yosemite toad habitat (i.e., developing a site-specific plan that may or may not include any measures that minimize the effects of grazing and may allow grazing intensities to exceed utilization standards) is not sufficient to meet the planning rule's requirement that **forest plans** contribute to the recovery of listed species defies logic.

3. Issues We Raised in Scoping that ere not Addressed in the DEIS

In our scoping comments we cited Lind et al. (2011, pages 12-14), a report cited in the Final Rule listing the Yosemite toad (Service 2014, page 150), which reported statistically significant negative (inverse) relationships for tadpole density and grazing intensity (tadpole densities decreased when percent use exceeded between 30 and 40 percent). We also asked that this be considered the best available science on the effects to the species from grazing, and that the utilization standard in Yosemite toad habitat be reduced to 30 percent, because this result suggests that grazing at intensities approaching and above the 40 percent threshold can negatively affect Yosemite toad populations. The DEIS does not mention this finding, nor include a measure to limit grazing utilization to 30 percent in Yosemite toad habitat under any of the alternatives, or discuss the effects of grazing at or exceeding 40 percent utilization.

We also pointed out in our scoping comments that Allen-Diaz et al. (2010) reported annual utilization by cattle ranging from 10 to 48 percent, while individual meadow use ranged from 0 to 76 percent, yet the 2004 Amendment caps allowable use at 40 percent. Allen-Diaz et al.

(2010) is clear evidence that the grazing utilization standards and guidelines under the current plan are regularly exceeded. As such, we asked that a standard or guideline be developed to require monitoring by Forest Service employees, not ranchers, with clearly defined triggers for the removal of cattle and the revocation of grazing rights if standards or guidelines are exceeded.

4. Species-specific Standards or Guidelines for Yosemite Toad not Included in the Draft Inyo Plan

It is unclear why SPEC-YT-GLD-1 and SPEC-YT-GLD-2, plan components that attempt to minimize the effects of grazing on Yosemite toad, are excluded from the draft INF plan. Under the current forest plan (USDA Forest Service 2004), Yosemite toad-specific standards and guidelines are the same on the SNF and INF and according to the DEIS (p. 30), "Species-specific proposed plan direction for Yosemite toad is similar to what is in the existing plans for the Inyo and Sierra National Forests." We were unable to find any mention of changing Yosemite toad management on the INF in the DEIS and the detailed proposed action provided during scoping stated (p. 36, emphasis added): "Yosemite Toad and Yellow-legged Frog Management On June 30, 2014 the U.S. Fish and Wildlife Service listed the Sierra Nevada yellow-legged frog (Inyo and Sierra National Forests) and the northern distinct population segment of the mountain yellow-legged frog (Inyo and Sequoia National Forests) as endangered species, and listed the Yosemite toad (Inyo and Sierra National Forests) as a threatened species. **Current direction specific to these species will be retained.** During plan development, opportunities to clarify or improve direction may be proposed in consultation with the U.S. Fish and Wildlife Service." If the omission of these plan components was deliberate, such a change is outside the scope and we ask that it be demonstrated why and how grazing management in Yosemite toad habitat on the INF would affect the species and contribute to recovery. The failure to consider the effects of changing Yosemite toad management on the INF would constitute a violation of NEPA's hard look standard.

5. Yosemite Toad Management Recommendations

- Sierra National Forest SPEC-YT-GDL-01 (Sierra Draft Forest Plan, p. 98): The language in SPEC-YT-GDL-01 specifies that in allotments where no specific management plan for Yosemite toad exists, livestock needs to be excluded from Yosemite toad "occupied or used locations, including wet meadows and associated streams and springs, during the breeding and rearing season." However, the Forest Service needs to complete a forest-wide monitoring effort to establish where Yosemite toad-occupied or used locations are located that overlap with grazing. Then programmatic range management actions should be taken to exclude livestock from these areas.

- Sierra NF SPEC-YT-GDL-01 (Sierra Draft Forest Plan, p. 98): In terms of excluding livestock from Yosemite toad breeding area, the language in SPEC-YT-GDL-01 appropriately requires that "if physical exclusion of livestock from breeding areas is impractical, then exclude grazing from the entire meadow." Similarly, the Forest Service should create a specific guideline under this section for Sierra Nevada yellow-legged frog in order to keep livestock grazing away from yellow-legged frog breeding areas, whether those areas are situated along a occupied stream, meadow, pond or lake shore.

- Sierra NF SPEC-YT-GDL-01 (Sierra Draft Forest Plan, p. 98): If the Forest Service deems that the standard proposed in SPEC-YT-GDL-01 does not apply to pack and saddle stock, then pack and saddle stock should not be allowed within Yosemite toad habitat. Standards and guidelines should be created for pack and saddle stock within areas of special aquatic features and Yosemite toad habitat, and also Sierra Nevada yellow-legged frog occupied sites, as the extent of the negative impacts of pack and saddle stock in meadows, riparian areas is clearly a potential threat to stream bank stability, riparian vegetation, water quality, and other habitat attributes for at-risk amphibians.

- Sierra NF SPEC-YT-GDL-02 (Sierra Draft Forest Plan, p. 98): If the Forest Service deems it appropriate to waive livestock exclusion standards detailed in SPEC-YT-GDL-01 if an "interdisciplinary team develops site-specific management plan to minimize impacts to the Yosemite toad and its habitat, by managing the movement of stock in and around wet areas," then this guideline should specifically detail how managing the movement of stock in and around wet areas would minimize impacts to Yosemite toad more than exclusion would.

- Sierra NF SPEC-YT-GDL-02 (Sierra Draft Forest Plan, p. 98): The draft plan proposes to allow a waiver for the required exclusion from Yosemite toad occupied meadows if there is a management plan with "a requirement for systematically monitoring a sample of occupied Yosemite toad sites (minimum of one location per allotment) within a meadow to assess habitat conditions and assess Yosemite toad occupancy and population dynamics." Sampling one location in an allotment to assess habitat conditions and population dynamics is clearly scientifically invalid and statistically indefensible. If any waiver is based upon a management plan rather than exclusion, that plan should require that multiple indicators of population dynamics be measured/monitored and that livestock be excluded if monitoring is not conducted. Population dynamics metrics may include information on abundance, relative densities, survival rates, information on age structure, egg mass survivorship, or even incidences of local extirpation. Similar guidelines should be established for Sierra Nevada yellow-legged frogs prior to any final approval of the Forest Plan.

O. Bi-State Sage Grouse

The Inyo National Forest provides habitat for a genetically distinct population of greater sage-grouse (bi-state sage-grouse) that the Regional Forester has designated a Species of Conservation Concern. The forest Assessment identified multiple threats to bi-state sage-grouse, including pinyon-juniper expansion into sagebrush habitats, invasive species, habitat loss from wildfire, predation by ravens and anthropogenic development (Inyo National Forest Assessment 2014: 90-91).

Livestock grazing (properly identified as a "disturbance" in the Draft Revised Plan, p. 19) also affects sage-grouse. Grazing degrades habitat characteristics critical to the sage-grouse life cycle. Livestock also promote the spread of cheatgrass (Reisner et al. 2013, 2015) and conifer encroachment into sage-grouse habitat. Domestic cattle and sheep can directly compete with sage grouse for forage, depriving the birds of essential nutrients, especially during the later brood-rearing period.

The Inyo Draft Revised Plan includes a vision for maintaining healthy sagebrush steppe (p. 18) and desired conditions for managing sagebrush types (p. 19) and sage-grouse habitat (pp. 32-34) that generally accord with the best available scientific information. However, the plan includes few prescriptions for how to achieve and maintain these conditions. The Inyo National Forest should look to the recently completed Greater Sage-grouse Bi-State Distinct Population Segment Forest Plan Amendment for the Humboldt-Toiyabe National Forest for specific conservation measures for conserving sage-grouse and its habitat.

The Inyo National Forest should also incorporate the following minimum conservation measures into its final plan to support habitat goals.

1. Identify and conserve essential sage-grouse habitat (Connelly et al. 2011; Manier et al. 2013; COT 2013; Aldridge et al. 2008). *The Humboldt-Toiyabe National Forest applied its conservation measures to all occupied sage-grouse habitat.*

2. Manage or restore essential habitat so that at least 70 percent of the land cover is sagebrush steppe sufficient to support sage-grouse (SGNTT 2011: 6, *citing* Aldridge et al. 2008; Doherty et al. 2010; Wisdom et al. 2011; *also* SGNTT 2011: 7; Karl and Sadowski 2005; Doherty 2008; Connelly et al. 2000: 977, Table 3; Knick et al. 2013: 5-6) with 15 to 40 percent sagebrush canopy cover (Connelly et al. 2000; SGNTT 2011: 26, *citing* Connelly et al. 2000; Hagen et al. 2007). This standard will help support the Inyo Draft Revised Plan's goals of preserving large expanses of open sagebrush steppe and habitat connectivity.

3. Identify and protect sage-grouse wintering areas (SGNTT 2011: 21; Braun et al. 2005, *citing* Connelly et al. 2000 and others; Moynahan et al. 2007; Walker et al. 2007; Caudill et al. 2013). The lack of winter habitat can be a limiting factor in sage-grouse conservation.

4. Restrict development to one site per section in essential habitat (SGNTT 2011: 21; Holloran 2005; Doherty et al. 2010; Doherty 2008), or an average of one site per section per analysis area where appropriate to support conservation goals (*see, e.g.,* Miles City Field Office Approved Resource Management Plan for Greater Sage-Grouse: 2-5, Table 2-4). The Inyo Draft Revised Plan contains no limit on the density of potential disturbance allowed in sage-grouse habitat, unlike every other sage-grouse conservation plan prepared by the federal government.

5. Limit surface disturbance to less than 3 percent per section in essential habitat (SGNTT 2011: 7; Knick et al. 2013; *see also* Baruch-Mordo et al. 2013: 237, Figure B). The Inyo Draft Revised Plan contains no limit on the amount of disturbance allowed in sage-grouse habitat, unlike every other sage-grouse conservation plan prepared by the federal government.

6. Prohibit noise levels associated with any anthropogenic activity to not exceed 10 dBA above scientifically established natural ambient noise levels at the periphery of sage-

grouse mating, foraging, nesting, brood-rearing and winter habitat during each season of use by sage-grouse (Patricelli et al. 2013; Patricelli et al. 2012 (report); SGNTT 2011: 64, *citing* Patricelli et al. 2010).[28] The Inyo Draft Revised Plan contains no limit on anthropogenic noise in sage-grouse seasonal habitats, which could be important for managing uses such as off-road vehicle use.

7. Restrict development of all types (not just power lines and other structures that could serve as predator perches, p. 97, SPEC-SG-STD 10, p. 104, SPEC-SG-GDL 07) within four miles of sage-grouse leks (e.g., SGNTT 2011: 22-24). Larger buffers may be required to conserve the species.[29]

8. Exclude renewable energy development in essential habitat (SGNTT 2011: 13). Renewable energy development can be deleterious to sage-grouse.

9. Exclude new rights-of-way in essential habitat (SGNTT 2011: 12).

10. Develop valid existing rights-of-way in essential habitat in accordance with Sage-Grouse National Technical Team report prescriptions (SGNTT 2011: 13).

11. Require that grazing strategies maintain at least 7 inches average grass height in nesting and brood-rearing habitat in sage-grouse range (Connelly et al. 2000). Livestock grazing should be managed to support desired conditions for sage-grouse nesting and brood-rearing habitat (pp. 33-34, Table 5, 6).

12. Restrict grazing until the completion of sage-grouse breeding and nesting period, and seasonally remove livestock from late brood-rearing habitat to allow sufficient regrowth of native grasses to ensure adequate residual height. Limited winter grazing may be appropriate, as long as it leaves sufficient residual grass height for nesting the next breeding season (*W. Watersheds Project v. Salazar*, 843 F.Supp.2d 1105, 1115 (D. Idaho 2012), *citing* Braun (2006, unpublished); *W. Watersheds Project v. Dyer*, 2009 WL 484438, at * 21 (D. Idaho 2009)).

13. Control grazing to avoid contributing to the spread of cheatgrass in sage-grouse habitat (Reisner et al. 2013; Reisner et al. 2015; Chambers 2008). The desired condition of <5 percent of annual grass in sage-grouse nesting habitat (p. 33, Table 5) may be impossible to achieve unless grazing is managed to avoid contributing to spread on the landscape.

14. Manage riparian habitat and wetlands to meet properly functioning condition; manage wet meadows to maintain native species diversity and cover to support sage-grouse brood-rearing (Connelly et al. 2000).

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[28] Patricelli et al. (2012) recommend measuring compliance with noise objectives at the edge of areas critical for foraging, nesting and brood-rearing rather than at the edge of the lek.

[29] A 4-mile lek buffer may include an average of 80 percent of nesting females (SGNTT 2011: 21); larger buffers may be recommended to conserve the species (6.2 miles, Aldridge and Boyce 2007; 6.2 miles, Doherty et al. 2010; 5.3 miles, Holloran and Anderson 2005; 4.6 miles, Coates et al. 2013).

15. Facilitate voluntary grazing permit retirement in sage-grouse habitat. The Humboldt-Toiyabe National Forest Bi-state Distinct Population Segment Forest Plan Amendment Record of Decision (p. 16) includes model language.

    RP-G-01: In bi-state sage grouse habitat, consider closure of grazing allotments, pastures, or portions of pastures, or managing the allotment as a forage reserve as consistent with maintaining sage-grouse habitat based on desired conditions as opportunities arise under applicable regulations, where removal of livestock grazing would enhance the ability to achieve desired bi-state sage grouse habitat conditions (ROD Table 1a or 1b).

16. Prohibit prescribed fire in sagebrush steppe with less than 12 inches annual precipitation (SGNTT 2011: 26, *citing* Connelly et al. 2000; Hagen et al. 2007; Beck et al. 2009) or areas with moderate or high potential for cheatgrass incursion (Miller et al. 2011).

17. Prohibit vegetation treatments that reduce sagebrush canopy cover to less than 15 percent (SGNTT 2011: 26, *citing* Connelly et al. 2000; Hagen et al. 2007).[30]

18. In areas of pinyon/juniper, avoid treating old-growth or persistent woodlands. In areas where sagebrush is prevalent or where cheatgrass is a concern, utilize mechanical methods rather than prescribed fire.

19. Prohibit herbicide application within 1 mile of sage-grouse habitats during season of use; prohibit use of insecticides (Blus et al. 1989).

20. Limit motorized travel to designated routes trails in essential habitat (SGNTT 2011: 11). Implement appropriate seasonal restrictions on motorized travel to avoid disrupting sage-grouse during season of use (Holloran 2005; Aldridge et al. 2012).

21. Close existing trails and roads to achieve an open road and trail density not greater than 1 km/1km^2 (.6 mi/.6 mi^2) in essential habitat (Knick et al. 2013).

22. Where valid existing rights-of-way are developed, restrict road construction within 1.9 miles of sage-grouse leks (Holloran 2005).

23. Install anti-perching devices on existing transmission poles and towers (SGNTT 2011: 64, *citing* Lammers and Collopy 2007). Dismantle unnecessary infrastructure.

The Forest Service should also consider protecting sage-grouse habitat as Zoological Areas (Forest Service Manual 2372) to support long-term conservation of sage-grouse and other sagebrush-dependent species. The agency could apply additional measures to conserve grouse beyond those prescribed for essential habitat, including prioritizing the areas for land acquisition

[30] Vegetation treatments may not be advised within 2 - 2.7 miles of sage-grouse leks (Beck and Mitchell 1997; Heath et al. 1997) or where sagebrush canopy cover is less than 20 percent (Beck and Mitchell 1997) or in sage-grouse winter habitat (Connelly et al. 2000; Eng and Schladweiler 1972).

and habitat restoration.

Absent adoption of these reasonable measures, many of which are adopted by the Humboldt-Toiyabe NF to the north, the Inyo draft plan would fail to maintain a viable population of this species of conservation concern within the plan area.

P. At-Risk Plants

1. General comments

Draft plan components for at-risk plants rely predominantly on coarse-filter, systems properties thinking. There is an intentional and profound movement away from monitoring for individual species. While the 2012 Planning Rule indicates this movement away from species-centric monitoring, the Rule also provides for the development of Plan components that address both system properties and species properties.

In their systems properties approach to species conservation, the draft plans make the assumption that maintaining or restoring the integrity and sustainability of coarse-level features, i.e. forest systems, will benefit at-risk species such that viable populations of these species will be maintained in their resident forests. Aerial extent of special habitats, soil and hydrologic conditions, and invasive species are examples of forest system properties that represent monitoring surrogates and indicators for at-risk plant species in the draft plans. For a systems properties focus to be an effective management approach for at-risk plants, we would have to know a good deal about the full distribution of each plant, and their ecological needs and behaviors, and have confidence that the indicators used to monitor at-risk plant conditions represent suitable surrogates for the species. For many of the plants on the Species of Conservation Concern (SCC) list, we do not yet have this degree of knowledge, and so our ability to create a link between population needs and surrogate monitoring indicators is limited.

The draft plans allude to this limitation when describing the forest service's management vision for small scale, special habitats that support at-risk plant populations;

> Given the localized nature of these special habitats, they are challenging to address comprehensively at the forest scale since they may be uniquely affected by different activities or trends in ecological conditions. (Inyo draft plan, p. 31; Sierra draft plan, p. 32; Sequoia draft plan, p. 32)

We must go further and note that not only is the localized nature of *special habitats* a challenge to address comprehensively at the forest scale, but the localized occurrences and distribution of at-risk plant populations *within* special habitats add still more challenge to the task of assessing the species properties for rare plants through a systems properties lens. The draft Plan components and DEIS go only part way towards addressing species properties requirements for at-risk plants when describing desired conditions for at-risk species and special habitats (see Section 2 below). By failing to include standards for quantitative, time-bound survey and monitoring of at-risk plants, and remedial action requirements when monitoring determines

conditions are in decline, the draft plans and DEIS fail to meet requirements to provide for the maintenance of viable at-risk plant populations.

While there are plan components that recognize the need to conserve the integrity of forest ecosystems and special habitats, no analysis in the DEIS explains how this approach can ensure that micro-habitat scale ecological requirements more commonly indicative of narrowly distributed, specialist plants, like many on the SCC list, will be met, nor are there components in the draft plans that direct how at-risk plant population trends will be monitored and managed over time.

What is more, there are areas of these forests where few botanical surveys have been performed. Future surveys will likely discover additional occurrences of SCC plant species, and even plants new to science. Therefore the more broadly focused, systems properties approach is too coarse a management tool to resolve and address the needs of at-risk plants. Over time, the chances of overlooking the needs or even the presence of at-risk plants at the project level will increase along with the risk of losing populations of those species either from project impacts, or general mismanagement, or both. The only way to understand the ecological needs, and to assess trends in the conditions of at-risk plants is to survey for them regularly; to go out and see where they live and assess what is happening in the areas where there live. To ensure this, the draft plans must provide standards and guidelines for managing at-risk plants that include mandatory survey requirements, and remedial actions that must be followed where survey findings determine conditions are in decline. The current draft plans and DEIS fail to provide these Plan components.

If the Forest Service adopts the overly-broad and often vague components for at-risk plants, then implementation of the plans will likely lead to further decline in conditions of at-risk plant populations over time. At the project level, crews will run over a plant they didn't know was there because vague or nonexistent standards failed to require appropriate surveys. A forester will alter a rare plant's light, hydrologic, soil, or temperature conditions by cutting down that 1 tree the guidelines said was ok to cut - even though cutting down the other 99 allowed in the guidelines had no impact at all. Based on the too-general nature of Plan components for at-risk plants, these damages are foreseeable and predictable, even though such actions would clearly not help achieve desired conditions, and could exacerbate current downward trends in conditions.

By choosing to rely predominantly on system properties to develop plan components, the draft plans fail to ensure for the viability and persistence of at-risk plants needing a species-focused approach to management. The predominantly systems properties approach, along with a move away from current requirements, creates an unacceptable risk where the needs of at-risk plants will be overlooked at the project level, leading to the mismanagement of their requirements for persistence, and an accelerated trend toward listings. The draft plans must be revised to include components that address species-specific management actions and activity restrictions for at-risk plants, and include mandatory monitoring and remedial action requirements.

2. Management needs and requirements that must be met for at-risk plants.

The Forest Service's June 5, 2014 Supplemental Need for Change document found that conditions for at-risk plants are "moderate to poor" and their trend is "stable to slightly declining." (p. 18). This suggests that the present and past management standards and guidelines have not been effective at conserving and recovering many sensitive plant populations, and/or that management directions have not been adequately implemented. The draft plans should therefore provide guidance on how to reverse the trends in these conditions. Regarding at-risk plant species, the Supplemental Need for Change document states:

> There is little direction in the current plans specific to at-risk plant species; however, current practices require consideration of species needs at the project planning level (p. 18, Supplemental Need for Change).

Forest Service Manual (FSM) 2670 details these requirements. Under the current planning conditions, the Forest Service is required as per FSM 2670 to analyze potential impacts to sensitive plants - those on the Regional Forester's Sensitive Species (RFSS) list - at the project level by way of a biological evaluation specific to the RFSS species. Projects should be designed and implemented so that project actions do not result in changes to an RFSS plant's population (plants and their habitats) that can lead to the population's loss of viability within the forest service management area. Forest Service Manual 2670 clearly defines the responsibilities of the agency in this regard (emphasis added):

Regional Foresters must "Ensure that specific management objectives and legal and biological requirements for the conservation of endangered, threatened, proposed, and sensitive plants and animals are included in Regional and Forest planning, and ensure that planning for those species common to two or more Forests is coordinated among concerned units."

Forest Supervisors must "Develop quantifiable recovery objectives and develop strategies to effect recovery of threatened and endangered species. Develop quantifiable objectives for managing populations and/or habitat for sensitive species."

Forest Plan Objectives for designated sensitive species (2672.32) require development of "objectives in Forest plans to ensure viable populations throughout their geographic ranges. Once the objectives are accomplished and viability is no longer a concern, species shall not have 'sensitive' status."

> 1. Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions.
>
> 2. Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands.

> 3. Develop and implement management objectives for populations and/or habitat of sensitive species. (FSM 2670.22).

Further, FSM 2670.31 directives for Threatened and Endangered Species also list the following requirements:

> 1. Place top priority on conservation and recovery of endangered, threatened, and proposed species and their habitats through relevant National Forest System, State and Private Forestry, and Research and Development activities and programs.
>
> 2. Establish, through the Forest planning process, objectives for habitat management and/or recovery of populations, in cooperation with states, the Department of the Interior, Fish and Wildlife Service (FWS) or the Department of Commerce, National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries), and other federal agencies.
>
> 3. Review, through the biological evaluation process, actions and programs authorized, funded, or carried out by the Forest Service to determine their potential for effect on threatened and endangered species and species proposed for listing.
>
> 4. Avoid all adverse impacts on threatened and endangered species and their habitats, except when it is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the Department of the Interior, Fish and Wildlife Service (FWS) or Department of Commerce, National Oceanic and Atmospheric Administration Fisheries

In the 2001 (and affirmed in the 2004) Sierra Nevada Forest Plan Amendment the agency standard for threatened, endangered, proposed, and sensitive (TEPS) species was to:

> Conduct field surveys for TEPS plant species early enough in the project planning process that the project can be designed to conserve or enhance TEPS plants and their habitat. Conduct surveys according to procedures outlined in the Forest Service Handbook (FSH 2609.25.11). If additional field surveys are to be conducted as part of project implementation, survey results must be documented in the project file. (See Chief Bosworth's memo, November 18, 2004).

We supported the above standard in 2001 and 2004, and recommended that it be carried forward in the current forest plan revisions, at a minimum, in order to meet the agency's responsibilities.

Thus, the Forest Service has a responsibility to provide sufficient objectives, standards and guidelines for at-risk plant and plant diversity management in the new forest plans to ensure that the agency's actions do not continue to contribute to species endangerment, and to ensure that species do not become rare or threatened or progress down a trajectory leading to endangerment and extinction.

We provide this review of current planning conditions in order to juxtapose existing plan guidance and the findings of the Supplemental Needs to Change document, with the management guidance provided in the 2016 draft Plan revisions for at-risk plants.

3. Draft Plans fail to provide plan components that explain how desired conditions for at-risk plants can be achieved.

While the draft plans provide specific rationale for the inclusion of plants on the SCC lists, the draft Plan components fail to provide sufficient guidance on how changes from existing Plans would help guide management of National Forest System lands so they are ecologically sustainable. Specifically, Plan Desired Conditions, Goals, and Guidelines related to at-risk plants are too broadly described to provide the necessary guidance on how desired conditions for at-risk plants are to be achieved. Plan standards that directly or indirectly address at-risk plants are vaguely written and, other than for meadows and some fens, contain no survey and monitoring requirements.

What's more, the one component that describes future plan specificity at the species level is provided as a plan goal, where "goal" is a new plan component term whose broad intent will rely on some future public process or interaction after the Plan Revision process has been finalized. The public is left to question how these forests are to manage for the persistence of SCC plants throughout the term of these three plans. This ambiguity is a critical failing of the draft plans to provide clearer management guidance, and will result only in contentious, ineffective, and likely impossible implementation at the project level. These failures are amplified to the extent that these "early adopter" plans represent models for subsequent plan revisions under the 2012 Planning Rule.

The current draft plan components are a shocking departure from the previous plan, and represent a significant erosion of current requirements given the stated elimination of the guidance provided by FSM 2670, which the forest service has declared will no longer apply once a revised plan has been adopted.

Draft Plan Components lack sufficient detail to be effective or perhaps even useful guidance to the forest staff and community stakeholders who will be tasked with interpreting and implementing the plans over the next several years. The draft plans must be revised to include plan components focused on species properties that include quantifiable objectives, strategies, and guidelines that can ensure the viability of each forest's at-risk plant species.

The following are the 2016 draft Plan Components that directly address management of at-risk plants.

Desired Conditions

Forestwide (SPEC-FW-DC)

01 Sustainable populations of native and desirable non-native, plant and animal species are supported by healthy ecosystems, essential ecological processes and land stewardship activities, and reflect the diversity, quantity, quality and capability of natural habitats on the forest. These ecosystems are also resilient to uncharacteristic fire, climate change, and

other stressors in order to support the long-term sustainability of plant and animal communities.

02 Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the plan area. Ecological conditions provide habitat conditions that: contribute to the survival, recovery, and delisting of species under the Endangered Species Act; preclude the need for listing new species; improve conditions for species of conservation concern; and sustain both common and uncommon native species.

03 The structure and function of the vegetation, aquatic and riparian system, and associated microclimate and smaller scale elements (e.g., special features such as carbonate rock outcrops, fens, or pumice flats) exist in adequate quantities within the capability of the plan area to provide habitat and refugia for at-risk species with restricted distributions. (Inyo draft plan, p. 32; Sequoia draft plan, pp. 33-34; Sierra draft plan, p. 33)

Objectives

There are no Plan Objectives specific to the management of at-risk plants. We recommend revising draft plans to change the Plan Goal (SPEC-FW-GOAL), to a Plan Objective (SPEC-FW-OBJ), as plan objectives are clearly defined plan components where plan goals are left largely to a future, currently undefined process.

Goal

Forestwide (SPEC-FW-GOAL)

03 Develop and implement a consistent, systematic, biologically sound program for plant species of conservation concern and their habitat so that federal listing does not occur. (Inyo draft plan, p. 89; Sequoia draft plan, p. 81; Sierra draft plan, p. 80).

Standards

There are no Plan Standards specific to the management of at-risk plants.

Guidelines

Forestwide (SPEC-FW-GDL)

03 Projects should protect at-risk species and their habitat by considering at-risk species early in the environmental planning process.

04 Habitat management objectives from approved recovery plans should be considered in the design of projects that will occur within federally-listed species habitat to promote recovery of the species.

05 Design features, mitigation, and project timing considerations should be incorporated into ground-disturbing projects that may affect occupied habitat for species of conservation concern. (Inyo draft plan, p. 103; Sierra draft plan, p. 97-98; Sequoia draft plan, p. 98)

Plan components specific to other forest categories (e.g., management areas like Riparian Conservation Areas, Special Habitats) indirectly provide additional management guidance and conservation benefits for at-risk plants. For example, plan components associated with Riparian Conservation Area vegetation could apply to at-risk plant species occurring in wet meadows and fens, though no at-risk species, groups of at-risk species, nor even the term at-risk plants, are specifically mentioned within these components.

Desired conditions for Special Habitats acknowledge the often small-scale nature of at-risk plant habitat;

Special Habitats (TERR-SH-DC)

> 01 The integrity of special habitats is maintained or improved. Composition, diversity and structure are maintained in all areas, including those with multiple use activities.
>
> 02 Microclimate or smaller scale habitat elements provide habitat and refugia for species with a specific geographic or other restricted distribution. (Inyo draft plan, p. 31; Sierra draft plan, p. 32; Sequoia draft plan, p. 33)
>
> 03 Conditions remain suitable for long-term sustainability of the suite of native plants adapted to rocky and gravelly habitats and the insect pollinators that rely upon them. (Sierra draft plan, p. 32)

Plan component (TERR-SH-DC-03) appears only in the draft SNF Plan. What is the rationale for not including #3 in either the Inyo or Sequoia plan components? To our knowledge, the same conditions addressed by #3 occur in all three forests and therefore the Inyo and Sequoia draft plans must be revised to include this component as well. Further, the sustainability of pollinators is central to the viability of all rare plant species, and should be a desired condition throughout special habitats.

The one standard related to Special Habitats management is almost dismissive in its direction to "consider" the resources at the project level;

Special Habitats (TERR-SH-STD)

> 01 At the project scale, consider special habitats during project design[31].
> (Inyo draft plan, p. 97; Sierra draft plan, p. 91; Sequoia draft plan, 92)

What aspects of special habitats should an interdisciplinary (ID) team consider at the project scale? What actions are required as a result of considering special habitats? Presumably, a simple

[31] There is a discrepancy between how Special Habitats standard (TERR-SH-STD-01) appears within the draft Plans, cited above, and how it appears in the DEIS Botany Supplemental Report, where it reads: "*At the project scale, consider special habitats during project design, using sufficiently scaled information to characterize such habitats.*" (DEIS Botany Supplemental Report, Appendix II, Table 5, p. 35; underline added for emphasis). We recommend revising the draft Plans so this standard includes all the language as in the Botany Supplemental Report, in addition to our recommendation for direction requiring appropriately timed pre-project floristic surveys performed to determine whether at-risk plants are present, and if present, mitigation action requirements to avoid and/or minimize deleterious effects of the project will be implemented..

act of inner-reflection on the specialness of an at-risk plant's habitat would in itself satisfy project-level requirements in these areas. Will this standard ensure that conditions for at-risk plants in special habitats remain on track towards achieving desired conditions? Only if explicit standards are added. For example, a revised standard must include direction like, "appropriately timed pre-project floristic surveys will be performed to determine whether at-risk plants are present, and if present, mitigation requirements to avoid and/or minimize deleterious effects of the project will be implemented." Again, mandatory survey and monitoring, and remedial action requirements where conditions are determined to be in decline must be included in standards that consider management of at-risk plant habitats.

Regarding how plan components address the needs of at-risk plants, the DEIS concludes;

> As a result, each threat in each ecosystem for each species of conservation concern identified has been addressed or mitigated in at least one plan component in each of the respective plans, to provide for the persistence of each species. (DEIS, p. 545).

The fact that each at-risk plant is addressed by "at least one plant component in each of the respective plans" does not explain how the persistence of each species has been provided for, especially given the components are over-arching statements of desired conditions, and vaguely worded design criteria (with the exception of some management area guidelines for meadows and some fens). The management formula proposed and analyzed within the DEIS, coupled with the removal of directives within FSM 2670, does not provide sufficient guidance for the persistence of each at-risk plant species.

4. Recommendations to Improve Draft Plans

We appreciate the efforts by forest botanists to discuss our concerns about the list during Plan development, and to consider our comments and recommendations when drafting the candidate plant SCC lists. A similar response is now needed to supplement the draft Plan with sufficient standards and guidelines to ensure desired conditions will be achieved for at-risk plants.

The draft plans must be revised to include additional objectives, standards, and guidelines with mandatory time periods for recovery of threatened and endangered plants, and accountable management of plant SCCs that are threatened by discretionary management actions, such as grazing allotments in rare plant populations. Stressors such as grazing in rare plant populations is not consistent with goals for species recovery, which must be the agency's "top priority" (FSM 2670.31). Doing so will strengthen Forest Service commitment to conserving and recovering at-risk plant populations.

Standards should be developed and grouped depending upon the type of threats shared by species, such as grazing, lack of fire, off-roading, reforestation activities, mining, trails, or similar threats.

Management strategies for at-risk plants must be added to revised draft plans to provide explicit direction and commitments to monitoring and active management where needed to maintain populations that are threatened by the following types of activities:

- grazing,
- fire suppression where plant populations require fire,
- salvage logging and reforestation activities,
- mining,
- trail use or off-road recreation

We highlight the threat of grazing to at-risk plants as one example. There are 174 plants on the SCC plant list for the three forest (DEIS, p. 434). DEIS Table 96 (DEIS, pp. 436-445) lists all SCC plants with attributes, including one column that notes "known threats to persistence." Grazing is mentioned as a known threat for 75 species. Therefore, 43% of the SCC have grazing as a threat, yet little is done to address this in the draft plans, especially in terms of mandatory survey requirements and remedial actions specific to at-risk plants.

Including monitoring requirements in grazing standards and guidelines for at-risk plants threatened by grazing is essential. If an at-risk plant population is found in Year 1 of monitoring to have been trampled or eaten, or habitat is degraded such that the hydrology, species composition (e.g., weed invasion), soil tilth and/or a biotic crust has been clearly degraded, there must be action taken to reduce grazing pressure at the site or risk conditions that could contribute to a trend towards federal listing. Standards must spell out what steps to take with the grazing permittee.

In Year 2 of monitoring, if the same types of impacts are found to occur, grazing on the allotment should be excluded until monitoring establishes recovery of the effected population. Riparian Conservation Area guidelines in the Sierra and Sequoia draft plans address these concepts for meadows:

> If meadow ecological status is determined to be moving in a downward trend, modify or suspend grazing (Guideline MA-RCA-GDL #15. Sierra draft plan, p. 63; Sequoia draft plan, p. 62), and
>
> Degraded meadows…require total rest from grazing until they have recovered and have moved to mid- or late-seral status (Guideline MA-RCA-GDL #16. Sierra draft plan, p. 63; Sequoia draft plan, p. 62).

These RCA guidelines need to be translated into Forestwide standards that apply to all at-risk plant species affected by grazing.

Below we present examples of the types of objectives and standards that we recommend are developed in revised draft plans, and that amend current draft components. These example Plan components for grazed habitats include requirements for annual monitoring and remedial actions, i.e., where monitoring indicates degradation, there is a requirement to modify or suspend grazing. Where subsequent monitoring indicates population recovery, cautious return to grazing is allowed again with annual monitoring requirements in place.

Example Plan Objective
Animal and Plant Species
Forestwide (SPEC-FW-OBJ)

Implement biologically sound, systematic standards and guidelines for at-risk plants and their habitat consistently so that federal listing does not occur.

Example Standards for Grazing
Forestwide (SPEC-FW-STD)

01 No active allotments should be permitted in known populations of an at-risk plant unless the threat is minimal as determined by the species ranking and the best available science. Where grazing is permitted in at-risk plant populations, annual monitoring of plant population status is required.

02 Where the status of an at-risk plant population is determined to be moving in a downward trend, modify or suspend grazing.

03 Degraded at-risk plant populations require rest from grazing until monitoring indicates recovery.

These standards could apply to all SCC plants threatened by grazing in each forest, provide clear and effective guidance, and still provide opportunity for grazing activity where appropriate. The Forest Service must develop additional plan objectives, standards, and guidelines for at-risk plants addressed in the draft plans.

We agree a systematic approach to addressing the needs of at-risk plants, as referenced in Planning Goal (SPEC-FW-GOAL #3), is required. One approach could be to develop components for plants grouped by category, e.g., plants threatened by common stressors as in our example above (and extended to other threat types listed above), plants with similar edaphic requirements, etc. CNPS and other in our coalition remain interested partners, willing to work with the Forest Service to develop the additional plan components needed to ensure revised plans can achieve their desired conditions.

5. Partnerships in Monitoring

Monitoring is a problematic issue because it is absolutely essential for science-based land management. There is no legitimate way to determine what the effects of management decisions are without regular cause-and-effect monitoring. At the same time, effective monitoring of at-risk plants requires a high level of experience and skill and cannot be relegated to inexperienced, outsourced workers. The requirement for annual monitoring in the forest plans pre-dating the 2001 revision was never met for most species by any of the national forests in the Sierra Nevada. Finally, the requirements for annual monitoring for the TES plants listed in Appendix E of the 2001 revision, and adopted into the 2004 supplement to that plan, were also not conducted and have not been met by the forests in general. This lack of management and adherence to standards is problematic and likely contributes to at-risk plants unable to move towards recovery.

Although it is disappointing that the forests have not fulfilled requirements to conduct annual monitoring of at-risk plants, we also do not believe it is reasonable to ask the forest botanists to monitor every at-risk plant population every year. However, plant populations must be visited regularly even in a cursory manner to determine if they even still exist. We would expect that most forest botanists will have developed a system to manage this on their own. However, it isn't guaranteed that this will happen, and that is why substantive forest plan guidance must be developed that establishes mandatory monitoring standards.

We recommend a system be developed to prioritize monitoring targets. For example, in a revised Plan, species threatened by grazing would have forestwide standards that apply to them. These standards would require annual monitoring. A monitoring prioritization criterion might identify species that are highly endemic with highly restricted ranges, e.g. a soil type that occurs in very a limited distribution, as priority at-risk species for monitoring.

A prioritization procedure could be accomplished with the assistance of a team of botanists, scientists, and lay botanists with expertise and interest in rare plant biology and conservation. The effort could be accomplished fairly easily via a series of web-based meetings to determine priority criteria. CNPS and others are willing to help with this work.

V. Soil Quality

Measures to limit logging on steep slopes to protect soil quality are included in the forest plans. For example, the existing Sierra forest plan includes the following standards:

> 125. Avoid tractor logging on highly erodible soils, where sustained slopes exceed 35%, except where supported by on-the-ground ID team evaluation.

(Sierra forest plan, p. 4-20) The Sequoia forest plan limits the use of tractors to slopes less than 40 percent (Sequoia forest plan, p. 4-31). The Sequoia forest plan further directs the minimization of "treatments on slopes greater than 15 percent" to protect watershed conditions in some management areas (e.g., Sequoia forest plan, p. 4-50).The draft forest plans eliminate these standards by omitting any standards and guidelines to address operations on steep slopes.

Safe operation and limitations to ground disturbance were identified in the DEIS for operations on low to moderate slopes, indicating that there is concern about soil disturbance on steeper slopes:

> The priority for treatment is within the wildland-urban intermix defense and threat zones and upland areas with road access and on low to moderate slopes where mechanical equipment can operate safely and with minimum ground disturbance.

(DEIS, p. 294). Despite the resource concerns about operations on steep slopes no environmental analysis of the consequences of this change is provided in the DEIS.

We ask that you retain the existing standards and guidelines in the forest plans for equipment operations on steep slopes. Furthermore, if any alternative does not include these standards, the DEIS should evaluate the environmental consequences of removing these standards.

VI. Fire Management and Air Quality

We acknowledge and appreciate the rigor and effort that went in the Wildfire Risk Assessment in the DEIS. The mapping and zoning effort and the detailed asset risk discussion and prioritization was thoughtful. It sets a high bar for establishing the spatially explicit pre-fire examination of the landscape that is called for in the 2014 Cohesive Strategy. We also support the permissive use of prescribed fire and managed fire across the plan areas when conditions are right. The criticism we offer below is centered in the deep concern we have for the need to dramatically scale up fire use to meet the fire regime-fire frequency needs on the landscape.

A. Fire Management

1. Background

Fire has likely been a key factor in the shaping and evolution of Sierra Nevada forest ecosystems since the most recent Sierra Nevada uplift approximately 2 to 3 million years ago. The geophysical mountain range, seasonal weather patterns, and climate have been interacting with vegetation to shape forest diversity, composition and structure for a very long time. The earliest evidence of fire in the Sierra Nevada existed in 16,000-year old lake bed sediments in Yosemite National Park (Smith and Anderson 1992, in Sugihara et al. 2006, p. 270).

Lightning strikes are numerous and increase with elevation with a significant 210,227 strikes in the Sierra Nevada from 1985-2000, over half (114,256) the strikes arriving in July and August. Human ignitions by Native Californians are thought to have begun roughly 9,000 years ago and was possibly "the cause of the change in fire regimes beginning 4,500 years ago" (Hull and Moratto 1999).

The fire suppression era began in the late 1890s in California with the U.S. Army effort to extinguish all fires in the national parks in the Sierra Nevada (van Wagtendonk 1991). Followed by the establishment of the Forest Service *in* 1905 and National Park Service in 1916, the systematic effort to control fire was underway. This misguided concept of total fire exclusion began to be questioned in the late 1960s largely due to the work of Harold Biswell. His pioneering efforts in prescribed burning included the recognition of the increase of shrub and small tree density resulting from fire exclusion. The National Park Service in 1968 and the Forest Service in 1974 moved from a strict policy of fire control to fire management with prescribed fire and wildland fire use becoming more common practices, but unfortunately, "routine fire suppression is still the rule,"(Sugihara et al. 2006).

The ecological, public health and public safety "costs" due to the history of fire exclusion highlights the continuing failure of Forest Service managers to understand and embrace the benefits of fire use at the landscape level for multiple resource benefits (not simply for fuels

reduction) and to fully embrace fire's role in lowering the increased risk of uncharacteristic fire and its impact to public health and safety.

Fire regime information and the association with various vegetation types defines the treatment levels needed to overcome the historic fuel burden (primarily surface and ladder fuels) and to deliver ecological integrity as required by the 2012 Planning Rule (36 CFR § 219.8 (a) and § 219. (a)(2), to maintain and restore the diversity of ecosystem and habitat types. All the various vegetation types in the Sierra Nevada share fire as the key natural disturbance process that delivered a rich, diverse ecosystem and maintained ecological integrity over time. There are several examples of science-based accounting of the fire-vegetation relationship from past and current research. Some examples include:

- Harold Biswell addresses the problem with broad scale fire suppression: "It was only about 100 years ago (written in 1989) that people decided that all wildland fires were harmful and determined to suppress them as quickly as possible. This practice has allowed unnatural changes to take place in the vegetation and caused the fuels to build up, making some present-day wildfires so intense that they cannot be stopped until the weather changes or they approach natural fuel breaks such as bodies of water or recently burned areas" (Biswell, H 1989, p. 3). This statement by Biswell (27 years ago) is supported by the fire patterns of the recent Rim (2013) and the King Fire (2014) which were essentially halted by large water bodies.

- R.J. Hartesveldt in 1962, "conducted the first detailed scientific study of giant sequoias and fire in the Mariposa Grove and concluded that the greatest threat to the survival of the big trees was catastrophic fire burning through the accumulated surface and understory fuels as a result of decades of fire exclusion,"(Sugihara et al. 2006, p.277).

- PSW-GTR-133 (1992) Chapter 12 p, 248 - Using a "conservative" fire return interval of 20 years on the Eldorado National Forest (586,000 ac), "we would expect a mean of 29,000 acres to burn annually." The authors (Weatherspoon, Husari, van Wagtendonk) noted only 13,944 acres burned from 1970 to-1990.

- PSW-GTR-133 (1992) Chapter 12, p, 248 - On the 1,168,000 ac Plumas National Forest, "58,000 acres would be expected to burn there each year with a mean fire return interval of 20 years." In fact, only 85,000 acres burned there in the same 21-year period.

- SNEP 1996 -The median fire return interval (FRI) for Ponderosa Pine/Mixed Conifer forest fire scar records dating back 125-340 years with median FRIs of 8-11 years (SNEP Vol. II, Table 38.1, p. 1045).

- In a recent Sierra Nevada-wide study of fire regime and vegetation (North et al. 2012) Forest Service Research Scientist Dr. Malcolm North found the relationship between fire and vegetation in terms of mean fire return interval was 487,846 acres/yr.

Fire intensity and tree mortality have increased in many areas of the Sierra Nevada. Due to a century plus of fire exclusion, conditions on the Sierra and Sequoia NF are as departed as a forest

landscape can get with tree mortality impacting the lower and mid-elevation forests and fires and fire suppression effects trending outside the natural range of variation of fire effects. Forest Service budgets continue to shrink, fire use (prescribed and managed natural ignitions) continues to be marginalized and not supported by leadership at a landscape level. Interestingly, research on managed fire effects outcomes demonstrates (Meyer 2015) that increased use of fires managed for multiple resource objectives contribute significantly to resilience. In spite of highly trained professional fire staff . . . funding limitations, staffing and logistical support at critical times of the year, air quality regulations, and serious cultural risk-aversion throughout the agency hamper attainment of landscape fire resilience.

Finally, we are highly critical of the ongoing Forest Service story line that fire cannot occur until logging occurs. This presentation (DEIS, p. 107 and elsewhere) has perpetuated anti-fire mythology and it flies in the face of landscape scale prescribed burns currently with NEPA signed (Caples Ecological Restoration Project-ENF; the past Boulder Burn Project-Sequoia NF) and the use of managed natural ignitions that do occur such as the recent 3,000-acre wildfire managed for resources objectives at the Indiana Summit RNA on the Inyo NF in early August 2016. Complete restoration cannot occur, and should not be considered a complete restoration cycle, without fire returned to the land. Fire use is also critical to maintain treatments that do require logging. The burning back log on the Sierra NF coupled with the Region 5 fire backlog (343,388 acres as of March 2015) suggests there is little doubt the three draft plans will ever move these landscapes to a resilient condition absent major program reorientation toward fire regime and fire frequency levels of fire use.

The Forest Service, in the early adopter plans, does not promote living with fire in a strong, clear voice with outreach commitments and objectives that quantify the scale of needed effort and accurately present the likely consequences of failure to reach fire regime-fire frequency. Achieving broader public and political support for a robust fire program of ecologically meaningful scale will require a major shift in Forest Service staffing and work orientation to an "all lands-all hands" effort in partnership with fire.

2. Compliance with the National Forest Management Act (NFMA) 16 U.S.C. §§ 1600-1614.

The National Forest Management Act, the 2102 Planning Rule at 36 CFR 219 and the Forest Service Directives FSH 1909.12-23.11 establish requirements to specifically address the science-based desired conditions that establish the pathway to ecological sustainability (36 CFR § 219.8 (a)) ecological integrity (36 CFR § 219.9 (a)).

a. Use of the Best Available Science and the most accurate, reliable and relevant information to the issues being considered.

The DEIS and Forest Plans fail to address the historic relationship between fire need and vegetation in both the DEIS effects analysis and in the plan components for the forest plans. While the DEIS acknowledges the various fire regimes (DEIS, p. 215-216) and level of departure from those conditions, the DEIS fails to address the real consequences of not re-establishing the

appropriate fire frequencies for those fire regimes on the landscape. The DEIS p. 212-214 presents the fire return interval departure maps for Inyo, Sierra and Sequoia NF pine and mixed conifer forests demonstrating significant departure from pre-settlement fire conditions. The majority of acres show fire return interval departure in the range of 33%-66% or >66% FRI departure less frequent than the pre-settlement era.

In Westerling et al. (2006), the authors identified the Sierra Nevada as one of the regions most likely to see increased fire activity due to future increases in temperature tied to climate change. Further, in the discussion on fire trends in the Sierra National Forest Climate Change Trend Assessment, (Meyer et al. 2013) summarizes the forest fire trends from the early 1980's to 2012 which show a significant increase in area burned and increased fire severity in the mid-elevation conifer forests of the Sierra Nevada. The DEIS, p. 61 cites Stephens et al. (2007) stating far less of California has burned than in the early 1800s but the fire severity impacts on vegetation has increased. Average fire size is expected to increase 13 to 20 percent by mid-century while fires of large size are also expected to increase by mid-century (Westerling et al. 2015) DEIS, p.63. It is important to note that Sierra Nevada forests are in a serious fire deficit so increases in fire size alone is not a bad thing. Also, we are concerned that reliance on background fire levels in the 1960-1990's era of intense fire suppression may skew the analysis away from the real problem of lack of fire. We want more fire acres but we want those acres to exhibit fire effects generally in the low and mixed severity (NRV) range of effects.

Missing from the DEIS discussion on fire trends is the fact that many of the larger "mega-fires" in recent years in the Sierra Nevada (King Fire 2014; Rim Fire 2013) already had major areas of treatment within the fire footprint but these areas in the central Sierra Nevada had historically seen very little prescribed fire or managed fire for resource benefit. The King Fire DEIS, p. 3-53 states that within the King Fire footprint "there had been little fire since 1908." This is telling and speaks to the fact that surface and ladder fuels are a key (90%) contributor to fire behavior yet the Forest Service restoration program continues to focus on over-story trees mistakenly expecting landscape resilience.

While citing to recognized research papers on fire trends and fire regime departure the draft plans fail to lay out a fire use strategy of sufficient scale to mitigate the changes (mega-fire, drought, tree mortality) that are attributed to a century of fire exclusion and climate warming. The suggested plan components and management strategies fall far short of defining the cultural and ecological changes needed to make a difference in our current fire outcome trajectory in the short or long term. In spite of all the talk about "increasing pace and scale of treatments" the fire management program does not address needed changes, both cultural and ecological, to actually ramp up fire use to fire regime levels of fire frequency, intensity and size. While the restoration treatments for terrestrial ecosystems suggest increases in treatments, the fire management section of the DEIS lacks specific objectives (none) to actually provide a commitment (staffing, budgets, logistic support for wildland fire modules) to build a fire program that would attain landscape level accomplishments at a scale to achieve resilience. For example, fire frequency is mentioned in the Fire Management desired conditions (DEIS, p. 38) but the draft plans lack plan components (related to the cultural barriers) to address attaining fire frequency on the landscape.

> Desired Conditions (FIRE-FW-DC) 03 Wildland fire burns with a range of intensity, severity and frequency that allows ecosystems to function in a health and sustainable manner. Wildland fire is a necessary process, integral to the sustainability of fire adapted ecosystems.

The fact that the FIRE-FW-DC calls out **fire frequency** as a key part of ecosystem function, health and sustainability but fails to describe acreage targets of fire use that accurately characterize (quantify) the **fire regime need** for the various vegetation types is a major failure in the plan.

The Planning Directives define Plan Objectives at FSH 1909.12 § 22.12. Regarding the nature of fire use and our current unstable fire environment, there is no better argument for "concise, measurable, and time-specific" rates of progress toward a desired condition focused on ecosystem integrity and sustainability. The Sierra NF ecosystem is on the verge of significant conversion due to a century of fire exclusion exacerbated by climate change and yet there is no commitment to increased fire use pace and scale in the draft plans that will address fire regime—fire need in existing vegetation types in the Sierra Nevada. This plan revision period is the time for fundamental program change in the Forest Service in the fire-associated West.

The management focus should be on treating surface and ladder fuels by shifting the management emphasis away from logging, except in the Community Wildfire Protection Zone, where management should be a combination of thinning and fire reintroduction. The remaining landscape should adopt prescriptions that lead with significant increases in fire use (Rx fire and managed ignitions) if we are to achieve landscape resilience and mitigate climate change impacts to forest ecosystems.

The draft forest plans should identify environmental indicators and plan objectives based upon land condition. For example, the departure in fire regime and frequency in various vegetation types and the needed reduction of accumulated fuel burden should be called out and quantified as characteristics of the landscape targeted for restoration. The varying fire regimes and changes in likely fire behavior effects, including fire severity effects, associated with the natural range of variability of fire effects should be represented as quantified desired condition target.

If it is desired that, "wildland fire burns with a range of intensity, severity and frequency that allows ecosystems to function in a health and sustainable manner" then the land condition changes needed to make stated desired conditions a reality need to be disclosed and be accompanied by target objectives related to the actual need on the land. If the approach is: "here is what we done historically under Alt. A" (which has failed to deliver anything close to resilience) and "here is what we'd like to do" (which is significantly less than the science-based fire regime calls for) then the Forest Service will fail to identify the real need on the landscape and forest restoration will remain out of reach. At least by calling out the magnitude of fire restoration need the Forest Service would be clear and transparent about how out of reach restoration goals are under existing budgets, staffing, logistics and cultural barriers.
This approach would demonstrate the real annual treatment need and would highlight the difference between the current fire program (budgets, staffing, accomplishments) and the level of program enhancement needed to achieve actual fire regime and NRV-based resilience. Then in

partnership with the Forest Service, other agencies, and various stakeholders we could work collaboratively to achieve a fire-regime based outcome. Program orientation and budget priorities are within the realm of Region 5 to promote and restructure. The Region is not a passive player in the annual budgeting process. The budget doesn't just arrive at the doorstep of the Regional office but instead is constructed in California between the Region and the 18 national forests. Fire will not wait for enough money from Washington, D.C. The change in program direction toward significantly increased fire use should happen in these revised plans.

Currently the draft forest plan alternatives Comparison of Alternatives by Restoration Activities DEIS, p. 50 is significantly flawed for several reasons:

> Area of prescribed burning (TERR-FW-OBJ-02) proposed for the Inyo, Sierra, Sequoia NF per decade acreage targets by alternative (Source: Table 6-8 in DEIS, p. 50).

Inyo NF Alternatives	A	B	C	D
Acres of prescribed burning (TERR-FW-OBJ-02)	18,000	20,000 - 25,000	15,000 - 35,000	20,000 - 25,000

Sequoia NF Alternatives	A	B	C	D
Acres of prescribed burning (TERR-FW-OBJ-02)	8,000	5,000 - 15,000	2,000 - 6,000	10,000 - 15,000

Sierra NF Alternatives	A	B	C	D
Acres of prescribed burning (TERR-FW-OBJ-02)	15,000	50,000 - 60,000	20,000 - 40,000	100,000 - 150,000

The acreage targets in these Prescribed Fire objectives are generally closer to what **the annual accomplishment target should** be for each of the three national forest based upon fire regime and fire frequency. There is no adequate description of how these numbers (above) were attained. Additionally, there is no discussion of the budgetary, staffing, logistical and general program reorientation needed to achieve these outcomes, let alone an expanded program that might have a chance of reaching fire resilience. The fire regime-fire frequency levels for the Early Adopter landscape needs to be identified to compare what is being recommended to what is needed for ecosystem stability and resilience.

Estimated acres of wildfire managed for resources objectives proposed in the DEIS, per decade, by alternative (DEIS p. 50):

Inyo NF Alternatives	A	B	C	D
Estimated acres of wildfires managed for resources	10,300	49,000	18,000	93,000
Sequoia NF Alternatives	**A**	**B**	**C**	**D**
Estimated acres of wildfires managed for resources	31,000	83,000	41,000	145,000
Sierra NF Alternatives	**A**	**B**	**C**	**D**
Est. acres of wildfires managed for resources	5,000	170,000	14,000	297,000

Sierra Forest Legacy and our coalition partners are strong supporters of managed wildfire use for multiple resource benefits. The managed fire levels in Table 6-8 DEIS, p. 50 shown above are highly speculative by nature due to the uncertainties surrounding any fire event. That said, the levels of managed wildfire use combined with the proposed prescribed fire acres in Tables 6-8, DEIS, p. 50 still remains significantly below needed annual fire frequency levels of each national forest. For example: on the Sierra NF the per-decade level of Rx Fire is 50-60,000 ac/decade for Alt. B and the managed fire estimate is 170,000 ac/decade. Converting to an annual acre metric of 23,000 ac/yr. the Sierra NF will still fall far short of achieving fire regime-fire resilience in the long term.

Experience in the Dinkey Collaborative for five years suggests that even with an extra $1-million-dollar/year budget boost from Forest Service CFLRP we did not come close to achieving the Dinkey Collaborative goal of prescribed fire use in the CFLRP Project area. We are at roughly 8,000 acres of prescribed fire in 5 years. This sad fact coupled with the aversion to manage natural ignitions for resource benefit on the Sierra NF in 2015 and recently the Spring Fire suppression decision (7-14-16) in John Muir Wilderness strongly suggests that writing numbers on paper promising a better future outcome while ignoring and sweeping under the rug the very real problems of cultural fire risk aversion leaves us with little trust in the plan recommendations. The problems are more complex and many are internal to agency culture.

When coupled with the failure to publicly embrace the science-based natural range of fire effects, described by your own Region 5 ecologists as desired conditions for fire effects outcomes, it leaves us stranded in the past watching the mountain range we care very deeply about lose ecological integrity as a forest system because the Forest Service can't muster the wherewithal to confront this challenge and support a suite of robust fire modules on each forest to initiate an ecologically adequate return of fire on the land. The agency has highly trained fire professionals who speak to us regularly of their desire to significantly increase fire use and take on the "living-with-fire"[32] challenge but Forest Service leadership appears to lack the willingness to make the program changes needed to achieve ecological resilience.

[32] http://www.takepart.com/feature/2016/08/19/prescribed-fire?cmpid=tpdaily-eml-2016-08-19

Because of cultural barriers and a general unwillingness to forge a robust fire program that is directly responding to ecological fire regime need, the Forest Service is sweeping under the rug 20 years of fire science that is calling out for more extensive fire use based upon fire regime need (North et al. 2012, 2015; Hessburg et al. 2016; Calkin et al. 2014; Marlon et al. 2012; Calkin et al. 2015; Houtman et al. 2013; Moritz et al. 2014; Hurteau et al. 2014).

The Forest Service must revise the Fire Management plan sections and demonstrate an accurate picture of the social, economic, ecological and internal agency barriers that are preventing achieving fire resilience. Nothing is more frustrating and divisive than to see the Forest Service bureaucracy trapped by its own fire suppression- fire exclusion history while stakeholders, scientists and agency fire managers support a paradigm change as time runs out on our ability to work with the Sierra Nevada ecosystem in partnership.

b. Agency cultural barriers to restoration of fire regime

In a recent Capitol Public Radio interview (August 2016)[33] with Dr. Scott Stephens, at UC Berkeley, Stephens discussed increasing fire events in California as the "new normal" and reiterated, as he has for nearly 20-years, that **seventy-five percent of the fuel profile contributing to fire behavior is surface fuels.** If one were to add another fifteen percent contribution of ladder fuels, ninety percent of the conditional change to fire behavior can be affected by persistent fire use and where needed, thinning tree (ladder fuels) 16" inches or less (PSW-GTR-220). In research in the Sierra Nevada, "prescribed fire only treatments significantly reduced the total combined fuel load of litter, duff, 1,10,100 and 1000h fuels by as much as 90%,"(Stephens and Moghaddas 2005). In this study, prescribed fire treatments compared favorably with other treatments in terms of demonstrating the lowest fire line intensities, rate of spread, and predicted mortality.

The failure to specifically delineate fire treatment levels related to fire regime—fire frequency levels in various vegetation types on the early adopter forests prevents achievement of desired conditions such as (FIRE-FW-DC) 03 because absent a wholesale shift in forest management, budget allocations and cultural risk aversion deeply embedded in the agency, the desired conditions are an unachievable fallacy. It is time to face the "fire exclusion paradox"[34] and work at a scale that is ecologically meaningful—the fire regime scale. Understanding the best available science means little unless the Forest Service shifts its program focus to truly implement a fire program that demonstrates a commitment to address fire regime need. We assert that cultural risk aversion and political-based decision making hamper needed changes in management strategies that could augment fire use to reach an ecologically significant level.

Instead of seeking scientist engagement to create a climate for cultural change, the Forest Service in Region 5-PSW is stifling scientific opinions that are calling for changes in fire management

[33] http://www.capradio.org/79219

[34] The fire exclusion paradox can be summarized as: "Long-term protection of land and natural resources from fire has altered vegetation and fuels, increased risk of severe fires and reduced resource values" (Arno, S. F., and J. K. Brown. 1991. Overcoming the paradox in managing wildland fire. *Western Wildlands*, v. 17, p. 40-46).

policy. In another recent Capitol Public Radio Interview Dr. Scott Stephens addressed the censorship of a colleague and key Forest Service scientist Dr. Malcolm North when he dared challenge the fire suppression culture inside the Forest Service in an article published in the journal *Science*.[35] Dr. Stephens was surprised that the article generated some much controversy. "They don't like their scientists making comments with regards to policy," says co-author Jerry Franklin, who formerly worked with the US Forest Service. "Obviously the implications of this article are that we need to make some significant changes in policy. And it's not just agency policy either, it has to do with a change in societal perspectives," said Franklin.

The interview above and the *Science* publication (North et al. 2015) advocate similar concerns from fire and vegetation ecologists throughout the west as to the need to let more fires burn, to have dedicated wildland fire modules (crews) who work with fire across the landscape and are not part of the fire suppression establishment. Ecological restoration will continue to be hampered until there is an internal agency recognition of the social barriers that exist which hamper working with fire as a primary objective of Forest Service work in the west and elsewhere. The early adopter forest plans specifically address social and economic concerns in the planning area, looking out at the communities, infrastructure, economic opportunities and partnerships but the Forest Service rarely looks "inside" at the bureaucratic structure and internal culture to examine how the Forest Service contributes to the hampering of attainment of ecological goals, particularly increasing fire use to ecologically relevant levels. It is past time the Forest Service take that look "inside" the internal culture in this plan revision period. As Regional Forest Randy Moore said in a recent Op-Ed in the Sacramento Bee, *Fire is Indispensable for Healthy and Productive Forests* (7-4-14). He stated "Fire can be seen as medicine for ailing forests." With fire and medicine, dosage matters and in the case of fire in the Sierra Nevada too small a dosage in the long run will be more damaging than too much.

c. The Southern Sierra Nevada Wildfire Risk Assessment

The Wildfire Risk Assessment (WRA) attempts to identify and prioritize risks to a suite of forest assets (mostly human centric) but does a fairly poor job of promoting the multiple resource benefits derived from fire as an ecological process which also has many far-reaching ecosystem benefits to humans. The creation of a threat-based asset risk prioritization system weighted heavily toward human infrastructure protection will foster fire risk aversion and promotion of asset protection via aggressive suppression. Sierra Forest Legacy authored a white paper on *Ecological Burning in the Sierra Nevada* (Silvas-Bellanca 2011) describing many of the ecosystem benefits of fire use in Sierra Nevada forests. These ecological benefits support the evolution, diversity, structure, function and composition of forests in the Sierra Nevada which, in turn, benefit many millions of residents and visitors annually. The Wildfire Risk Assessment should be amended to include much more on fire's benefits to the land and people.

The risk assessment mentions a few habitat benefits (3 of 4 species that generally use the same habitat components) while little attention is paid to other ecological fire functions such as fostering plant renewal, nutrient recycling, low-cost of maintenance burning to maintain forest resilience, and other societal or economic benefits of using fire to increase the resilience of the

[35] The audio file is located at: http://www.capradio.org/articles/2015/09/17/us-forest-service-prevents-its-own-scientist-from-talking-about-study/

landscape. Managed wildfire and prescribed fire can improve smoke management outcomes versus the increasingly frequent uncontrollable events (Schweizer and Cisneros 2016) and improve resilience in ways that are not possible with logging by limiting the costs of fighting mega-fires in remote areas where the is no access (North et al. 2015; The Fire Challenge Letter 2015). There are also multiple benefits to wildlife and ecosystem function in post-fire landscapes that contribute to ecological integrity and diversity in Complex Early Seral Forests.

As mentioned elsewhere in our comments, one of the main conclusions from (Westerling 2015) analysis is that the amount of area expected to be affected by wildfire is unacceptably high and that "treatment" can reduce the affected area. This is, however, not consistent with other perspectives in the science community that increasing the extent and frequency of wildlife in more moderate conditions will have a beneficial effect on the forest ecosystem (Stephens et al.2007, Hurteau et al. 2014; North et al. 2012, 2015). It is not appropriate to rely on fire extent alone, in a fire-excluded landscape, to define an undesirable result. A "bad" (undesirable) outcome in the Westerling analysis is one that results in an increase in the annual acres burned of any intensity or extent. This period is not characteristic of the fire regime fire need nor does it address the era (1961-1991) as one of intense and often successful fire suppression. The Early Adopter plan areas cover about 4.47 million acres and have a variety of plant community types with specific fire return intervals. A review of those forest types and fire return intervals indicates that for the three national forests combined we would expect the annual area burned under a natural fire regime would be about 150,000 acres burned per year – five times the value used by Westerling to judge an outcome from "treatment" to be good. The basic framing in Westerling et al. is at cross purposes with the desired condition to reestablish a natural fire regime on this landscape. This is emphasized by the assumption in the Westerlng et al. analysis that fires greater than 1,000 acres are to be avoided and actions that reduce this amount to less than 20 percent of the annual area burned expected under the natural range of variability will result in the desired condition.

Because fire is an essential process in this fire-dependent landscape and intimately tied to providing for ecological integrity (North et al. 2015), the draft plans and environmental analysis need to call out the specific changes in management to increased use of fire under conditions that are consistent with the fire regime scale, frequency and intensity and then evaluate the capacity for each alternative to accomplish this outcome over time. Currently, none of the alternatives will result in increased use of managed or prescribed fire compared to current levels because none of the alternatives adequately address the sociological barriers, risk aversion, staffing, logistics, and funding in a forward thinking manner.

The DEIS, p.69 suggests several constraints (seasonality, wildlife LOPs, burning in riparian habitat for at-risk species, and air quality constraints) while remaining silent on the very real internal cultural barriers, risk aversion, staffing and other factors that severely hamper the implementation of a scaled up fire program. To maintain scientific integrity, a revised analysis is necessary that integrates fire regime need with focus on reaching a level of treatment that **acknowledges all the constraints** and establishes goals and objectives to alleviate them. The clearer approach would provide a viable path forward and demonstrate transparency and collaborative goal setting in the real world effort to increase fire use . . . which is the stated goal of the Fire MOU Partnership that we established with the Forest Service.

The reliance on mechanical treatments is overstated in Alternatives B/D. Considering either current budgets or likelihood of declining funding, the alternatives will not deliver ecosystem integrity or ecological sustainability as required by the 2012 Planning Rule 36 CFR § 219.8; § 219.9(a) absent a significant increase in the prescribed and managed fire programs. In research by Malcolm North and others (North et al. 2015) the authors identify multiple constraints to mechanical treatments that limit mechanical treatments in the 58% productive forests to about 25% of the available land base. Primary constraints in the study were steep slopes and distance from roads which are very challenging, expensive and ecologically risky obstacles to overcome. North et al. (2012) makes the point that if Region 5 wants to get serious about the pace and scale of treatments then as the paper's title suggests, *Using Fire to Increase the Scale, Benefits, and Future Maintenance of Fuels Treatments,* is the logical and cost-effective thing to do.

d. Fire effects within NRV are a significant positive benefit.

We question if Forest Service Region 5 can accept the science-based natural range of variability of fire effects in a generally low and mixed severity ecosystem that defines the Sierra Nevada as a positive restoration outcome? And can the Forest Service employ more managed wildfire to get fire benefits at larger ecological scales?

Both the use of the Best Available Science to inform the planning process (36 CFR § 213.3) and NEPA's requirement for Scientific Accuracy (40 CFR §1502.24) in the EIS demand scientific information be of high quality and the analysis be scientifically accurate (40 CFR § 1500.1(b)). In Meyer (2015), Region 5-Southern Zone Ecologist Dr. Marc Meyer's recently examined the natural range of variation (NRV) of fire effects historically for 17 recent, large wildfires (>1000 acres) in the southern Sierra compared to managed natural ignition fire effects and fire suppression effects. The effects comparison reveals several interesting facts that were not considered in the fire effects analysis in the DEIS.

Meyer noted that in "several studies of fire severity patterns in the Sierra Nevada that wildfires managed under suppression objectives ('suppression wildfires') contrast greatly with resource objective wildfires or the NRV." Whereas the effects of wildfire managed for resource objectives tracks very closely with the natural range of variability of fire effects identified by Forest Service ecologists and others (See Figure 1 from Meyers (2015) below). This information presents a compelling argument for increased use of natural ignitions that needs to be incorporated in the forest plan goals and objectives to scale up to natural fire regime levels of fire use.

This research clearly demonstrates that decisions to manage natural ignitions produce positive resources benefits ***"in all examples studied"*** while the decision to suppress wildfires drives fire effects far outside the natural range of variability of effects. The natural range of variability for fire effects is the concept regional ecologists have established for framing the *desired conditions* for restoration of Sierra Nevada national forests. Choosing to suppress fires burning under appropriate weather and resource conditions is choosing to move away from stated desired conditions for the early adopter forest plans. The plans and DEIS do not acknowledge this contradiction and arbitrarily suggest that fire suppression in wildlands is primarily about safety and asset protection while ignoring the negative ecological consequences on the land.

The estimates in the Meyers paper used historical, contemporary reference and modeled-derived information sources that provide more robust estimates of the NRV than historic data alone. These patterns contrast with wildfires managed under suppression objectives, which, based on several previous studies in the ecoregion, indicate that most suppression wildfires fall outside the NRV with respect of high fire severity portion and patch size. Meyer noted that, **"suppression fires in the mid-elevation forest types of the Sierra Nevada national forests generated high-severity fire proportions and mean high-severity patch sizes that were roughly twice those of wildfires managed primarily for resource benefits in Yosemite National Park"** citing Miller et al (2012).

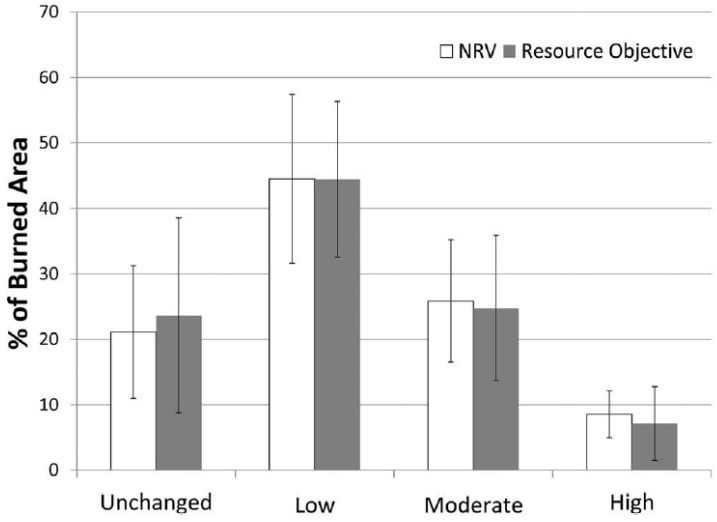


Figure 1. Mean (± SD) fire severity proportions in each severity class based on NRV and resource objective wildfires in the national forests of the southern Sierra Nevada.

Figure 13. Source: Meyer (2015).

The early adopter forest plans need to address the negative outcomes associated with fire suppression and create plan components that support the increased use of managed natural ignitions with goals and objectives that increase staffing, budget realignment, logistical support and other factors to ensure ecological sustainability and ecological integrity as required by the 2012 Planning Rule. Demonstrating a real move away from suppression provides support for the notion that the Forest Service is confronting the "fire exclusion paradox" in a truly meaningful way.

3. Compliance with the National Environmental Policy Act (NEPA)

a. Forest Service arbitrarily dismisses fire use as an effective tool (40 CFR 1500.1(b)).

In the DEIS, p. 72, the Forest Service goes to great lengths to confine the ability of Alternative C to produce an acceptable level of restoration in the planning period. The reason for this confounded reasoning is the failure to correctly grasp and describe the intent of a broadly fire-focused alternative. The following points should be considered in the revised forest plans and DEIS for a fire focused alternative that doesn't sweep under the rug the critical need to return to the fire regime-fire frequency reality of the Sierra Nevada landscape and do it quickly. Fire is not a force that we can negotiate with and propose half-loaf measures that ignore fire's role in the ecosystem. We are proposing dramatic changes in Forest Service management and a major shift in focus from logging to expanded fire use in terms of staffing, budgets, logistical support, training, outreach, and collaboration. Mechanical treatments would function to support fire reintroduction. The effort would entail an "all lands" and "all-hands-on-deck" approach where nearly all Forest Service staff would be trained and available for fire support work and where the budget and performance accountability would revolve around increasing fire use in this planning period. This paradigm shift recognizes, given fire and climate trends, that absent a robust fire program, the additional benefits of forest lands including, recreation, wood production, watershed health, biodiversity, carbon sequestration and other uses may not be realized in this century.

In the DEIS, pp. 107 and 572, the notion is presented that fire is somehow less effective at creating resilience and heterogeneity than mechanical treatments. The Forest Service states that compared to fire use, "the precision of these (mechanical) treatments increases the likelihood that associated restoration goals are achieved. Fire, even if used intentionally, does not allow that level of specificity for tree arrangement, size, and species distribution" (DEIS, p. 572). Evidently the Forest Service believes that the conditions of 1850 pre-settlement forests, touted for their ecological integrity in decades of forest ecology research, are somehow flawed in their make-up, resilience and prehistorically long relationship with fire, that only chainsaws and silvicultural know-how can get things back on track. It has been only recently that the collaboratively initiated PSW-GTR-220/237 prescription which Sierra Forest Legacy co-authored has moved the Forest Service away from simple, homogenizing prescriptions, even tree spacing, disregard for legacy structures, and ignoring wildlife habitat values in marking, towards more complex, holistic and ecological complex project designs. . . as if fire did it.

The Forest Service suggests that planning for fire is "more complex" and "more costly" to conduct prescribed burns on some landscapes. We find these assertions are unsupported by evidence. We believe the overall cost of a logging project (project planning, NEPA analysis, survey time, road building, contract and sale layout, oversight of what is usually a 5-year implementation period, potential piling and clean-up, contracting costs and more) are far greater than the costs of a large scale prescribed fire project. We believe the comparison fails to take a hard look at such comparisons and is arbitrary and lacks transparency, in violation of NEPA.

In the case of managed fire use, while there should be some pre-planning and zoning (as in the Wildfire Risk Assessment) there are no NEPA costs, survey costs, layout costs, long

implementation period, sales prep and administration cost outlays, etc. A final factor is the scale at which fire operated in the past was self-limiting which is the very definition of resilience and is a tremendous ecological "benefit" of working with fire. This year's fires burned into last year's or last decade's fires providing a fire-limiting effect that controlled the spatial scale and intensity of frequent fire events. Re-initiating a frequent fire regime and escaping the "fire exclusion paradox" should be the primary goal of the revised forest plans for ecological, budgetary and public safety benefits. We do not believe that the nature of the current climate/fire situation in the Sierra Nevada will respond positively to any less of an effort.

b. Inadequate range of alternatives (40 CFR §1502.14)

In addition to the reasons stated above including the failure to create a range of alternatives that take a hard look at and adequately address the need to rapidly return to a fire regime-fire frequency level of fire use in the Sierra Nevada forest plans, the Forest Service mispresent Alternative C's ability to produce effective fire outcomes of scale.

The DEIS, p. 72 fails to adequately assess and integrate the benefits of Alternative C's fire treatments which focus on surface and ladder fuels while retaining higher canopy where needed for old forest species such as California spotted owl and Pacific fisher. As mentioned above, surface and ladder fuels contribute to 90% of fire behavior activity and allow for significant fire behavior change while limiting impacts on at-risk species. This is why PSW-GTR-220, p.24 called out treating surface fuels and thinning 10 to16-inch diameter trees to limit unwanted fire behavior results. A stepped-up fire program, discussed above, that aims at returning to fire regime levels of fire use, is an accurate description of Alternative C's intention and is derived from the content of nearly every fire science research paper written in the last 20 years. A fire-focused alternative includes changes in Forest Service management emphasis, program budget shifting to fire use as a priority and performance criteria that supports managers who advance large scale fire use. Proper and unbiased construction of a fire-focused alternative cannot be tethered to the past ways of operating in a fire suppression culture. In the revised plans we would like to work more closely with Forest Service staff in the construction and analysis of an alternative that addresses fire regime and fire frequency and one that helps forge the transition to a full fire culture.

4. Recommendations

The foundation of the revised forest plans and their fire management alternatives should contain the following plan components and other plan content.

Additional Desired Conditions:

- The network of agencies and stakeholders creates a stable socio-cultural environment that fosters the collaborative management of fire for resource benefits.

- Social investment and financial resources support the decrease in fire exclusion and an increase in the use of managed fire necessary to achieve desired conditions for ecological restoration and public health and safety.

Additional Goals:

- Establish at least two wildland fire modules[36] on the national forest.

- Work with adjacent land management agencies to identify methods to reduce costs and increase effectiveness in restoring fire to the landscape.

- Prior to and during the fire season assess conditional thresholds under which desired conditions can be met for the strategic fire management zones. Work with tribes and adjacent landowners to identify areas and resources of value considered in the assessments.

- Develop and implement a collaborative fire training program, e.g., like TREX, to expand prescribed fire opportunities and create a skilled public and private work force to support the use of fire for resource benefits.

- Wildland fire modules serve as a dedicated team of specialists and practitioners to lead to the application of prescribed and managed fire and are supported by fire suppression staff as needed.

- Planned prescribed and managed fire projects over large landscapes to increase efficiency and readiness to utilize or apply ignitions when environmental conditions are appropriate.

Additional or Revised Objectives:

- Wildland fire modules--two in each national forest--will be established on the national forests during the first two-years of plan implementation to support prescribed fire and managed fire pace and scale needed to reach desired conditions.

- Restore low and moderate severity fire mosaics of beneficial fire using prescribed fire on (Inyo NF – 10-14,000 ac/yr.; Sequoia NF 15-20,000 ac/yr.; Sierra NF 20-25,000 ac/yr.) acres within 10 to 15 years following plan approval.[37]

- Create a network of reduced fuels along ridgelines, roads, or other natural or man-made features to support the use of large prescribed fires and in managing wildfire for ecological benefits in four large landscapes (greater than 30,000 acres) within 10 to 15 years following plan approval.

[36] Wildland fire modules are generally made of 7 or more highly trained fire professionals. The primary purpose of a wildland fire module is managing rather than suppressing fires to reduce costs, assisting other units with resource benefit fires and prescribed fires, meeting the agency project preparation objectives, and executing prescribed fires within narrow burn windows. Modules can also monitor fire effects, manually reduce fuels in management units, and assist other agencies with fire use and fuels treatment projects.

[37] Annual estimates for each national forest were based on the annual area burned under a natural fire regime as described in Exhibit II.1. The values for the objectives were set by taking roughly 50 percent of the total area burned annually for vegetation types of pine, mixed conifer, western white fir, red fir, and giant sequoia combined. We believe this is a reasonable starting point for pace and scale for the eventual attainment of the expected fire regime for these types.

Additional Guidelines:

- Prior to prescribed fire use in stands of older trees (especially, ponderosa pine, sugar pine) with significant duff build up, utilize tree protection mitigation measures described in RMRS-GTR-238, where practical, to limit mortality.

Strategies and Partnership Opportunities (other content as allowed by 36 CFR 219.7)

- Participate in the Fire MOU Partnership to build a broad base of support for the increased use of wildfire and prescribed fire for resource benefits through intensified outreach and education efforts.

- Work with the Fire MOU Partnership to expand collaborative efforts to support multi-jurisdictional burn projects via cost-share agreements and strategic fire planning.

- Establish a collaborative group with air regulators, air quality scientists, concerned stakeholders and public officials to facilitate information exchange, collaborative outreach and education efforts, and joint media response efforts focused on presenting the "net gain" in public benefits from expanded fire use.

- Coordinate with Fire MOU Partners to develop consistent, positive messages regarding fire ecosystem benefits, public health and safety, fire safe living, smoke management, collaborative planning and the "net public benefits" of a scaled up fire program.

- Actively engage fire scientists in public and media outreach, fire science information transfer, and in discussions with policy makers regarding increases in fire use.

B. Air Quality

1. Background

There are three levels of regulation of air quality in California: federal, state and local air districts. Air quality protection in the United States is guided by the federal Clean Air Act and its regulations to protect the public from harmful pollutants. Regulations adopted and refined since the early 1970s are the primary way air quality regulators and land managers interact regarding fire and smoke mitigation. The State of California in conjunction with federal regulators and local air districts all manage the complicated air environment in California and the Sierra Nevada. California's air environment is complicated by serious (though improving) air pollutant levels and 39 million people living and breathing in the state. California is broken up into several large air basins that are treated as air quality control basins which have prescribed levels of allowed pollutants, where air regulators exert downward pressure to reduce pollutants that impact public health and other resources such as ozone impacts to human health and forests in the Sierra Nevada.

The primary challenge for Forest Service fire managers in dealing with air quality regulations in California is that several of the pollutants (PM_{10}, $PM_{2.5}$, NOX, and ground level ozone) in part, come from the smoke environment in California's forests that have had fire operating as a key ecological process for thousands, if not millions of years.

As recently as 2014 there have been three significant federal rule-making efforts proposed by the Federal Environmental Protection Agency to limit ground-level ozone, improve exceptional events filings for exceedances of the National Ambient Air Quality Standards (NAAQS), and to protect pristine air sheds and visibility in national parks and wilderness in the U.S. All of these efforts have major implications for fire managers in California. These efforts have the potential to improve collaboration and allowances for fire use in the Sierra Nevada as long as the Forest Service, NPS and other stakeholders can remain active partners with air regulators in the discussions regarding the science-based trade-offs of an active fire program (with lower overall emissions) or the increasingly harmful emission levels from mega-fires we are witnessing today.

While there isn't a "no fire" option, a century of fire suppression and fire exclusion have left many air regulators, policy makers, health officials and the public believing that fire can be eliminated from our environment or at least heavily controlled.

History is proving us wrong and the current consensus among air quality scientists in California is that we need an expanded fire program to limit harmful levels of emissions and protect public health (Schweizer and Cisneros 2016). The **"net public benefits"** of fire use, including benefits to public health and safety, should be key elements of the draft forest plans. Integrating fire and air quality considerations should be clearly spelled out in the draft plans. Smoke management, public outreach and messaging, collaborations with other agencies especially state and federal air regulators, Fire MOU Partners and other stakeholders should be clearly spelled in the draft plans.

2. Compliance with the National Forest Management Act.

a. The Forest Planning Rule at 36 CFR § 219.3 requires the Forest Service to utilize the best available scientific information in designing plan components for the revision of the Inyo, Sierra and Sequoia National Forests.

Air quality emissions trade-offs that disclose the likely outcomes of smoke management choices on public health are important for Forest Service decision-makers, policy makers like the San Joaquin Air Pollution Control District (APCD), the public health community, forest community residents and the broader public to see and understand during the plan revision process.

Air quality scientists and fire scientists in California and throughout the west are calling for increased fire use to reach a level of fire resilience and ecosystem stability (the Fire Challenge Letter 2015). Both disciplines agree that fire size and intensity are increasing in the west, causing the public's exposure to smoke to increase which had been effectively postponed through fire suppression. Wildfire and smoke are inevitable elements of living in the west and they are a critical part of ecosystem function contributing to diverse forests and healthy watersheds. There

is no no-fire option but the public has been lured into thinking that fire can be controlled through fire suppression efforts thus deferring smoke emissions to the future. The future has arrived.

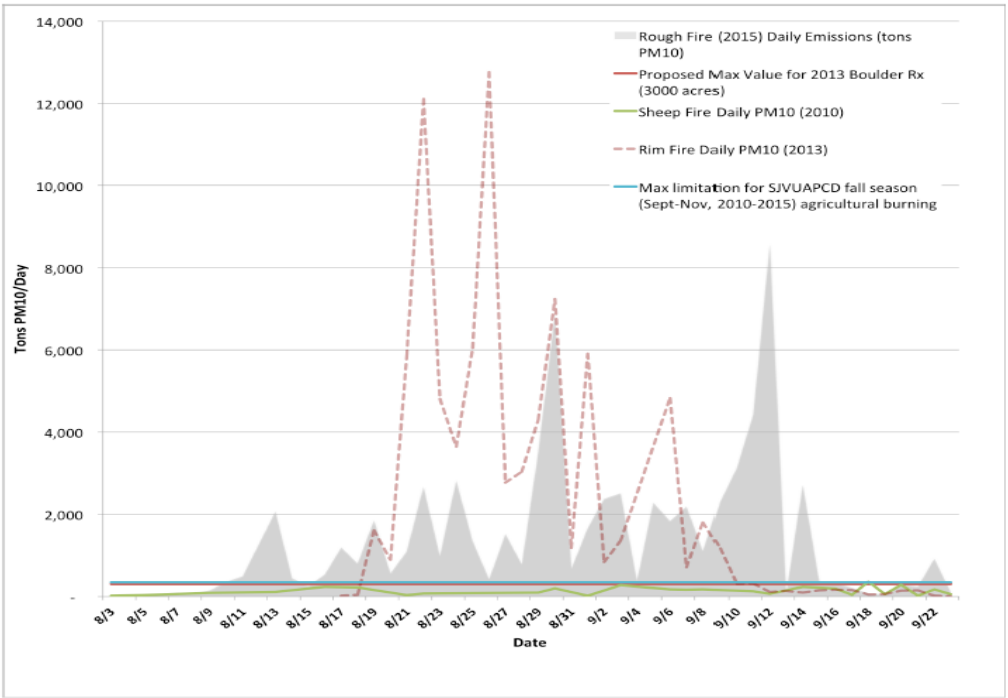
The DEIS should consider the long term negative public health outcomes of the continued reliance on fire suppression. Atmospheric scientists and air quality specialists affirm that "long term air quality is inextricably linked to ecosystem health in the Sierra Nevada" (Schweizer and Cisneros 2016). They further state, **"We contend that landscape use of ecological fire is essential to forest and human health. Radical change is needed where beneficial wildland fire smoke is treated as natural background and exempted from much of the regulation applied to anthropogenic sources."** (Emphasis added).

In a recent letter (1-22-16) from a highly regarded group of western fire scientists addressed to USDA, DOI, EPA and the Council on Environmental Quality, *the Fire Challenge Letter* also calls out for better science-based policymaking regarding long-term emissions trade-offs and benefits to public health from ecological fire use and the increasing negative fire effects of the persistent fire suppression-fire exclusion policies in fire-associated ecosystems.[38]

The DEIS (p. 119) suggests that emissions from large wildfires generally produce levels in the range of 100 to 1,000 tons of fine particles in smoke per day. In a recent comparison of smoke monitoring data in the Sierra Nevada (Figure 1. below) emission from the Rim Fire (2013) and Rough Fire (2015) were compared to a recent wildland fire managed for resource benefit (the Sheep Fire 2010), 2013 modeled emissions for the Boulder burn on the Sequoia NF, and maximum limitations in fall agricultural burning in the San Joaquin Valley APCD. The Rim and Rough fires were producing 6,000 to 12,000 tons of PM_{10} per day during peak periods. (The Fire Challenge Letter 2016).

[38] The Fire Challenge Letter (1-22-16) http://www.sierraforestlegacy.org/Resources/Community/PrescribedFire/Wildfire%20Smoke%20Regulation%20Letter%20FINAL%20(00000003).pdf

Figure 1. Relative magnitude of daily PM_{10} emissions (tons/day) from recent fires affecting the San Joaquin Valley Air Pollution Control District airshed. Typical daily emissions from Agricultural allocations, Rx fire, and managed wildfire ignitions in this air district are 100 times lower than the daily emissions from the two megafires



Source: Boulder Creek Rx Fire smoke management planning documents, Sheep, Rough, and Rim Fire progression data combined with tools built by California Air Resources Board to estimate emissions, San Joaquin Valley Unified APCD emissions allocation databases, and the 2015 staff report to the Board, found at: http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2015/November/final/09.pdf

Figure 14. From scientists' Fire Challenge Letter, available at: http://www.sierraforestlegacy.org/Resources/Community/PrescribedFire/Wildfire%20Smoke%20Regulation%20Letter%20FINAL%20(00000003).pdf

The Forest Service must accurately define the comparison of recent fire emissions outputs and include the public health ramifications of an active fire program where smoke from ecological fire (fire functioning under the normal fire regime and fire frequency) that promotes forest resilience, at the same time mitigating long term health effects from mega-fire emissions. This appropriate level of disclosure in the revised plans will help policy makers and the public understand the real social trade-offs of a century of fire suppression and fire exclusion.

Hurteau et al. (2014) cites increased population exposure to unhealthy air pollutants, but the authors clearly state that increased fire use is key to reaching forest resilience in the future. The paper reports a projected 19-101% (median increase 56%) increase in wildfire emissions in California due to climate change that, "may have detrimental impacts on air quality and, combined with a growing population, may result in increased population exposure to unhealthy air pollutants." The authors further state that, "the current state of many of these fire-adapted ecosystems is substantially altered as a result of landscape fragmentation and fire exclusion. Efforts to adapt to changing climate and projected increases in large fire frequency are likely going to require the restoration of fire as a natural process in these systems."

The DEIS should clarify that the public health effects from significant wildfire emissions increases in California are highly likely unless the lands under Forest Service jurisdiction significantly increase the restoration of fire as a natural process at the appropriate scale based upon science-based fire-regimes and fire frequencies. The path forward for increasing fire use should resemble the numbers we have offered above (see Fire Management section above) to begin to address fire regime-based fire return at a meaningful scale during this plan revision period.

3. Compliance with NEPA

a. The DEIS Air Quality section lacks scientific accuracy (40 CFR § 1502.24; § 1500.1(b).

NEPA requires analysis to have a high degree of scientific and professional integrity regarding data and methodology relied upon in the description of the affected environment and the environmental consequences of the various alternatives being considered for adoption (40 CFR §1500.1(b) and §1502.24). The air quality impacts analysis in the DEIS lacks an accurate assessment of smoke impacts due to major changes in the baseline Alternative A forest environment and last reported emissions data from 2013 that has not accounted for the massive level of tree mortality impacting a significant level of tree species in Table 1, p. 2, Smoke and Air Quality Report (Nick 2016), a supplemental report in the project record.

Several of the species in Table 1 showing lbs/acre of various pollutant emissions from specific tree species in the three early adopter forests does not mention the significant mortality event that has been ongoing since 2012. This is no small matter for several reasons: 1) Increased fire effects, fire spread and emissions outputs are likely to follow increase mortality due to concerns over fire fighter safety and inability to go to direct attack due to the fire hazard of working in and around dead trees (as is currently happening in the Cedar Fire, August 2016 on the Sequoia NF); 2) Dead standing and down fuels have different emissions factors on their own and when combined with live fuels; and 3) Treatments by vegetation type (Tables 3-5-7-9) are no longer accurate since much of the vegetation in the pine type and the ("all other acreage" column) is now dead. Recent Forest Service and Tree Mortality Task Force estimates suggest 70,000,000 trees are dead in the planning area.

Table 1. Emissions factors used by vegetation types adopted from the First Order Fire Effects Model (FOFEM)

Pollutant	037 Ponderosa Pine Emissions Factor (lbs/acre)	021 Lodgepole Pine Emissions Factor (lbs/acre)	032 Pinyon Juniper Emissions Factor (lbs/acre)	003 Fir/Spruce/Hemlock Emissions Factor (lbs/acre)	093 Aspen / Birch Emissions Factor (lbs/acre)	All other acreage (Sugar Pine – Douglas-fir) (lbs/acre)
PM 10	930	504	221	1,872	1,446	486
PM 2.5	789	428	187	1,587	1,226	412
CH 4	465	258	103	938	721	223
CO	10,011	5,621	2,126	20,245	15,502	4,510
CO 2	71,614	27,283	31,505	138,432	114,603	79,228
NOx	56	8	42	102	94	111
SO2	51	22	20	98	80	49

Above: excerpted table is from page 2 of the Smoke and Air Quality Report (Nick 2016), a supplemental report in the project record

The DEIS, Figure 22, p.122, uses a baseline era for emissions of (1961-1990) from Westerling 2015 that represents an era of intensive fire suppression (Sugihara et al. 2006). As mentioned elsewhere in our comments, this baseline period of emissions fails to represent the natural fire regime-fire frequency that is characteristic of the Sierra Nevada ecosystem. The Fire Regime emissions from an active NRV-fire scenario of low and mixed severity fire using (North et al. 2012) and the approximately 500,000 acres of annual fire in the Sierra Nevada, scaled down to the three early adopters, should be the starting point for an accurate emissions baseline analysis.

b. Regional haze analysis discussion in DEIS requires improved disclosure.

The forest plan desired conditions for air quality (AIR-FW-DC) (e.g., Sierra draft plan, p. 9) suggest that visibility will be "maintained or improved to the natural background condition" specified in the California Regional Haze State Implementation Plan. This desired condition statement is flawed due to the very nature of fire in California's forests and the mistaken idea that natural background conditions in California had "pristine" air quality under their natural fire regime--the fire regime the Forest Service currently claims it wants to return to.

The DEIS (p. 120) and elsewhere describes the need to comply with the EPA Regional Haze Rule and the concept of maintaining high visibility in Class I air sheds in Forest Service wilderness areas. While we support the effort to maintain high levels of air quality in these areas impacted by other anthropogenic pollutants, it is a fallacy to think we can prevent (nor would we want to prevent) fire in the fire-associated ecosystems of California and its national parks and wilderness. The DEIS should disclose the fact that fire is a primary restoration option in wilderness and is promoted there for maintaining ecosystem sustainability and ecosystem integrity (36 CFR § 219.8; § 219.9). Ecological fire use emissions in these Class I areas should be treated as natural background conditions (Schweizer and Cisneros 2016; Stephens et al. 2007) and should be exempted for visibility maintenance requirements in the Regional Haze Rule. EPA is considering this recommendation in its current update of the Regional Haze Rule (2016). The Forest Service should identify the discordant nature of conflicting air quality regulations while strongly supporting limitations on other anthropogenic pollutants.

c. EPA and the Forest Service have responsibility for protecting and maintaining habitat for threatened and endangered species that exist in habitat that is fire dependent.

The Forest Service should make it clear in the DEIS that the Federal EPA has multiple jurisdictional responsibilities beyond the Clean Air Act and its requirements to protect public health. EPA also has responsibilities to maintain a high level of integrity in NEPA analysis and it has responsibilities to protect threatened and endangered species, many of which reside in strongly fire-associated ecosystems such as the Sierra Nevada. EPA also has responsibilities to

protect the water quality of the waters of the United States including rivers and streams flowing in and from the Sierra Nevada that are significantly impacted by a century of fire exclusion and historic fire suppression. Returning to a natural fire regime will benefit several resource areas under Federal EPA and state jurisdiction.

4. Recommendations

The foundation of the revised forest plans and their air quality alternatives should contain the following additional or revised plan components and other plan content.

Desired Conditions

- The air quality value of visibility in Class I air sheds reflects the air quality outcomes of a natural functioning forest ecosystem where regular fire plays a critical role in forest resilience and emissions reductions in California.

Additional Goals

- The Forest Service will engage air regulators, policy makers and the public in the state level planning efforts aimed at increasing carbon stability, carbon sequestration and limiting CO2 emissions in California's forests.

- Include modeled or measured evaluations of emissions trade-offs in project level planning for prescribed fire and reporting related to decisions to manage natural ignitions for multiple resources objectives.

Partnership and Collaboration

- The Forest Service and other Fire MOU Partners along with interested stakeholders engage the public health community to establish a health alert notification system to provide information to local physicians, public health officials, school nurses and at-risk citizens regarding burn plans, ignition timing, and resource and long term public health benefits from well-managed prescribed fire and managed wildfire programs.

VII. Sustainable Recreation

The 2012 Planning Rule requires the "integration of resource management and uses, with respect to the requirements for plan components of § 219.8 through § 219.11." (36 CFR 219.7(c)(2)(viii)); *see also* FSH 1909.12, ch. 20, § 21.12(4) ("the Responsible Official shall ensure an integrated set of plan components"). Unfortunately, components (desired conditions, objectives, standards/guidelines) in the draft plans do not provide any integration between resource uses, rather they are only designed in a functional manner (listed resource by resource). The desired conditions should set forth the desired landscape of the future and the other plan components give guidance on how to get there. Regrettably, the sustainable recreation desired

condition statements in the draft plans are all programmatic in nature; they are not spatial (desired landscape); they are not integrated.

Integrated planning should form the basis for sustainable recreation. "At the forest scale, sustainable recreation is derived through the integrated planning process and emerges as the resultant set of desired recreation opportunity spectrum classes" FSH 1909.12, ch. 20, § 23.23a(1)(d). Unfortunately, the Recreation Opportunity Spectrum (ROS) layer included in the draft plans is not the result of an integrated planning process. Rather, it is simply the updated ROS layer from the previous forest plans. The "desired" ROS layer should be the result of a rigorous interdisciplinary process that, for example, would identify where in the landscape recreation is a "stressor" to other resource values – like water quality, aquatic species, meadows, etc.

Additionally, there are no standards in the draft plans for achieving sustainable recreation. There are only vague sustainable recreation guidelines. For example, Scenic Integrity Objectives (SIOs) are at the heart of ensuring that some semblance of scenic-character achievement will be maintained. The Forest Service Manual (FSM 1900) is clear that the Scenic Management System (SMS) must be used "in all plan revisions to address scenic character and develop scenery-related plan direction unless the Responsible Official provides written justification and obtains concurrence from the Regional Forester." FMS 1921.03(2)(c). The SMS is being used in this planning process, therefore, there should be standard(s) for meeting or exceeding assigned SIOs in the Standards section of the draft plans.

A. Recreation Opportunity Spectrum

We are pleased to see that the ROS classes are being treated as a desired future condition in the draft plans. However, the draft plans do not include the required plan components (objectives, standards and guidelines) consistent with the ROS classification that will contribute to achieving the desired conditions over the life of the plan. Additionally, the analysis that was conducted to compare the recreation opportunity spectrum classes across the alternatives contains numerous inconsistencies, which makes it difficult to evaluate the analysis process and rely on the conclusions made.

1. ROS plan components

The Planning Rule requires that a plan "must include plan components, including standards or guidelines, for integrated resource management to provide for ecosystem services and multiple uses," including outdoor recreation. 36 C.F.R. § 219.10(a). In addition, plans "must include plan components, including standards or guidelines, to provide for: Sustainable recreation; including recreation settings, opportunities, and access; and scenic character. Recreation opportunities may include non-motorized, motorized, developed, and dispersed recreation on land, water, and in the air." *Id.* § 219.10(b)(1)(i); *see also* FSH 1909.12, ch. 20, § 23.23a(2)(g) (plans "must include plan components, including standards or guidelines, to provide for sustainable recreation," including "[s]pecific standards or guidelines where restrictions are needed to ensure the achievement or movement toward the desired [ROS] classes").

The ROS classification system plays an important role in achieving the goal of sustainable recreation by providing the framework for where particular recreational opportunities, activities, and expected experiences are located across the forest. Zoning areas for quiet, non-motorized forms of recreation through the ROS is an important component of achieving both the sustainable recreation and ecological sustainability mandates of the 2012 Planning Rule.

Unfortunately, the draft plans fail to provide the necessary plan components, including standards and guidelines, to achieve the desired future ROS conditions over the life of the plan. This constitutes a violation of the 2012 Planning Rule. For instance, the draft plans do not provide managers with plan components containing the level of specificity necessary to advance the desired characteristics of the primitive and semi-primitive non-motorized ROS classes (e.g., opportunities for isolation and solitude, opportunity to have a high degree of interaction with the natural environment) and to ensure compliance with those classes (e.g., motorized use is prohibited). The draft plans also fail to ensure that the ROS is enforceable in site-specific projects and planning. The draft plans include a guideline that "[r]ecreation projects should meet the minimum characteristics for recreation opportunities and settings as classified by the [ROS]," but that "[e]xemptions may occur on a case-by-case basis as documented in site-specific permits." Draft Plans, REC-FW-GDL-01. While we believe that guidelines are enforceable under the 2012 Planning Rule, this plan component should be strengthened to a standard and the broad exemption language should be omitted.

Included below are examples of plan components that we recommend for inclusion in the final forest plans:

- Forestwide (REC-FW-DC)
    1. Primitive ROS class provides recreation opportunities in unroaded and nonmotorized settings. Unmodified natural and natural-appearing settings dominate the physical environment.
    2. Semi-primitive ROS class provides for non-motorized recreation opportunities in unroaded and nonmotorized settings. A natural-appearing setting dominates the physical environment, with only subtle or minor evidence of human-caused modifications.
- Forestwide (REC-FW-OBJ)
    1. Within 10 years, all motorized roads and trails within primitive and semi-primitive nonmotorized ROS classes will be decommissioned or converted to non-motorized trails.
- Forestwide (REC-FW-GLD)
    1. Primitive ROS class should exist as essentially unmodified natural environment with a fairly low concentration of users, with little evidence of other users in the area. The area should be managed to be essentially free from evidence of man-induced restrictions and controls. Only essential facilities for resource protection are used and are constructed of on-site materials. No facilities for comfort or convenience of the user are provided. Spacing of groups is informal and dispersed to minimize contacts with other groups or individuals. Motorized use within the area is not permitted.

2. The semi-primitive nonmotorized ROS class should remain a predominantly unmodified natural environment with a low concentration of users, but there is often evidence of other area users. The area should be managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Facilities are primarily provided for the protection of resource values and safety of users. On-site materials are used where possible. Spacing of groups may be formalized to disperse use and provide low-to-moderate contacts with other groups or individuals. Motorized use is not permitted.

- Forestwide (REC-FW-STD)
    1. Roads and motorized trails are inconsistent with primitive and semi-primitive nonmotorized ROS classes and will be prohibited**.**

Additionally, we are disappointed that the draft plans do not protect inventoried roadless areas (IRAs) – whether existing IRAs protected under the Roadless Area Conservation Rule or newly inventoried areas under the Chapter 70 process – through the primitive and/or semi-primitive nonmotorized ROS classes. ROS alternatives in the draft plans should account for and reflect roadless values, with important IRAs that are not recommended for wilderness designation subject to a year-round primitive, or semi-primitive non-motorized prescription. By contrast, the current draft plans would allocate significant proportions of roadless areas – including highly deserving areas that would be recommended as wilderness under Alternative C – to motorized ROS prescriptions. *See* Section X, below (addressing inadequate draft plan direction on management of inventoried roadless areas).

Recommendations: The Forest Service should include ROS plan components (including standards and guidelines) that will advance the desired characteristics of the primitive and semi-primitive nonmotorized ROS classes (e.g., opportunities for isolation and solitude, opportunity to have high a degree of interaction with the natural environment) and ensure compliance with those classes (e.g. motorized use is prohibited). ROS settings should reflect roadless values, with the large majority of IRAs zoned for primitive or semi-primitive non-motorized uses. This will require a revised or supplemental DEIS. *See* 40 C.F.R. § 1502.9(a) & (c).

2. Data inconsistencies and analytical conclusions

NEPA is designed to foster informed and transparent decision-making. *See* 40 C.F.R. § 1500.1; *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). To achieve its "primary purpose" of "allow[ing] for informed public participation and informed decision making," the language of an EIS must be "clear" and "supported by evidence that the agency has made the necessary environmental analyses." *Earth Island Inst. v. U.S. Forest Service*, 442 F.3d 1147, 1160 (9th Cir. 2006); *accord* 40 C.F.R. § 1502.1. More broadly, NEPA requires the Forest Service to "[e]ncourage and facilitate public involvement in decisions which affect the quality of the human environment." 40 C.F.R. § 1500.2(d). Thus, an EIS must "be written in plain language" and presented in a way that "the public can readily understand." 40 C.F.R. § 1502.8; *see also Or. Envtl. Council v. Kunzman*, 817 F.2d 484, 493 (9th Cir. 1987) ("an EIS must be organized and written so as to be readily understandable by governmental decisionmakers and by interested non-professional laypersons likely to be affected by actions taken under the EIS").

"The information must be of high quality" because "[a]ccurate scientific analysis . . . and public scrutiny are essential to implementing NEPA." 40 C.F.R. § 1500.1(b).

A series of data inaccuracies and questionable analytical conclusions in the DEIS frustrate meaningful public participation, in violation of NEPA. For instance, the Tables (101, 102, 103, 104, 106, 108) in Volume 1, Chapter 3 of the DEIS contain apparent inconsistencies in the acreage numbers and percentages. For example:

- Inyo: In Tables 101 (Existing recreation opportunity spectrum classes, Inyo National Forest) and 104 (Existing [alternative A] and desired [alternatives B, C, D] recreation opportunity spectrum classes in acres and percent of national forest alternative, Inyo National Forest), the Percent Total Acres for the primitive (790,306 acres) and semi-primitive nonmotorized (471,686 acres) classes in alternative A appear to be incorrect, considering a total of approximately 2,100,000 acres on the Inyo National Forest. A more accurate percent total acres would be closer to 38% and 22%, respectively. Secondly, the narrative on page 480 describing the Consequences Specific to Alternative A, states that "the amount of nonmotorized setting in this alternative is higher than alternative B and less than alternatives C and D." Yet the data provided in Table 104 indicates that the nonmotorized setting in alternative A is less than as in alternatives B and D.
- Sequoia: Acreage numbers for primitive (106,931), semi-primitive nonmotorized (202,863), and semi-primitive motorized (244,090) in Table 102 (Existing recreation opportunity spectrum classes, Sequoia National Forest) differ substantially from the primitive (329,0340), semi-primitive nonmotorized (57,085), and semi-primitive motorized (174,455) acreage numbers in alternative A on Table 106 (page 487). We assume the differences reflect updates made to correct data errors and forest plan amendments. However, to increase transparency and present the information in a way that the public can readily understand, a detailed explanation of the changes made should be included in the analysis.
- Sierra: In Table 103 (Existing recreation opportunity spectrum classes, Sierra National Forest), the Percent Total Acres for the primitive (515,780 acres) and semi-primitive nonmotorized (132,080 acres) classes appear to be incorrect, considering a total of approximately 1,433,000 acres listed on Table 103. A more accurate percent total acres would be closer to 36% and 9%, respectively. Secondly, acreage numbers for primitive (587,287), semi-primitive nonmotorized (36,077), roaded natural (564,980), and rural (82,894) in alternative A on Table 108 differ substantially from the primitive (515,780), semi-primitive nonmotorized (132,080), roaded natural (606,386), and rural (133,002) acreage numbers on Table 103. Again, we assume the differences reflect updates made to correct data errors and forest plan amendments. However, to increase transparency and present the information in a way that the public can readily understand, a detailed explanation of the changes made should be included in the analysis.

Because of the apparent inconsistencies with the data in the Tables (101, 102, 103, 104, 106, 108) displaying the number of acres and percent total acres in each ROS class, the analytical conclusions made in the DEIS are subject to question. This situation is further compounded by

the problems associated with the comparisons made in the narrative and in Tables 110, 111, 112. For example:

- Inyo: The narrative describing the Comparison of Recreation Opportunity Spectrum For the Nonmotorized Setting (page 500) is confusing as it states: "Alternative A has the lowest amount of nonmotorized setting and the lowest amount of motorized setting." Yet Table 110 indicates that alternative A has the second highest amount of motorized setting and alternative C has the lowest amount of motorized setting.
- Sequoia: The Comparison of Recreation Opportunity Spectrum Nonmotorized Setting on page 501 states that "alternative A has the lowest amount of nonmotorized setting and the lowest amount of motorized setting." This statement is inconsistent with Table 111 displaying alternative A with the second highest amount of motorized settings and alternative C with the lowest amount of motorized setting. Additionally, Table 106 indicates that the amount of nonmotorized setting in alternative A is the same as alternatives B & D, and that the amount of motorized setting in alternative A is the same as in alternative B & D.
- Sierra: The narrative on page 493 describing the Consequences Specific to Alternative A (Sierra National Forest), states: "The amount of nonmotorized setting in this alternative is higher than alternatives B and D, and less than alternative C." Yet Table 112 (page 502) displays alternative A as having the lowest amount of nonmotorized setting of all the alternatives. Additionally, the Comparison of Recreation Opportunity Spectrum Nonmotorized Setting on page 503 states that "alternative A has the lowest amount of nonmotorized setting and the lowest amount of motorized setting." This statement is inconsistent with Table 112 displaying alternative A with the second highest amount of motorized setting compared with alternatives B and D, and alternative C with the lowest motorized setting.

Recommendations: The data inconsistencies in the tables and the irregularities in the Analytical Conclusions must be reconciled and a revised set of conclusions developed and included in a revised or supplemental DEIS for review and comment by the public.

B. Management of Over-Snow Vehicle Use

Under the newly promulgated subpart C of the Forest Service's travel management regulations, 36 C.F.R. part 212, each national forest with adequate snowfall must designate and display on an "over-snow vehicle use map" a system of routes and areas where over-snow vehicle (OSV) use is permitted based on protection of resources and other recreational uses. 36 C.F.R. § 212.81. OSV use outside the designated system is prohibited. *Id.* § 261.14. Implemented correctly, the rule presents an important opportunity to enhance quality recreation opportunities for both motorized and non-motorized winter users, protect wildlife during the vulnerable winter season, and prevent avoidable damage to vegetation, air and water quality, and other resources.
It is important that the forest plans provide a good framework for management of OSV use and for subsequent winter travel management planning under the new regulation. Unfortunately, the draft Inyo, Sierra, and Sequoia plans fail to provide that framework, thereby frustrating the forests' efforts to achieve compliance with subpart C.

1. Background and regulatory framework

a. Executive order minimization criteria

In response to the growing use of dirt bikes, snowmobiles, all-terrain vehicles, and other off-road vehicles (ORVs) and the corresponding environmental damage, social conflicts, and public safety concerns, Presidents Nixon and Carter issued Executive Orders 11644 and 11989 in 1972 and 1977, respectively, requiring federal land management agencies to plan for ORV use based on protecting resources and other uses. Exec. Order No. 11,644, 37 Fed. Reg. 2877 (Feb. 8, 1972), *as amended by* Exec. Order No. 11,989, 42 Fed. Reg. 26,959 (May 24, 1977). When designating areas or trails available for ORV use, agencies must locate them to:

(1) minimize damage to soil, watershed, vegetation, or other resources of the public lands;
(2) minimize harassment of wildlife or significant disruption of wildlife habitats; and
(3) minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands.

Id. § 3(a). The Forest Service codified these "minimization criteria" in subparts B and C of its travel management regulations. 36 C.F.R. §§ 212.55, 212.81(d). The agency has struggled, however, to properly apply the criteria in its travel management decisions, leading to a suite of federal court cases invalidating Forest Service travel management plans.[39] Collectively, these cases confirm the Forest Service's substantive legal obligation to meaningfully apply and implement – not just identify or consider – the minimization criteria when designating *each* area and trail, and to show in the administrative record how it did so. As the Ninth Circuit recently held, "[w]hat is required is that the Forest Service document how it evaluated and applied [relevant] data on an area-by-area [or route-by-route] basis with the objective of minimizing impacts as specified in the [Travel Management Rule]." *WildEarth Guardians*, 790 F.3d at 931.[40] To satisfy its substantive duty to minimize impacts, the Forest Service must apply a transparent and common-sense methodology for meaningful application of *each* minimization criterion to *each* area and trail being considered for designation. That methodology must include several key elements, including gathering and applying site- and resource-specific information to

[39] *See WildEarth Guardians v. U.S. Forest Serv.*, 790 F.3d 920, 929-32 (9th Cir. 2015); *Friends of the Clearwater v. U.S. Forest Serv.*, No. 3:13-CV-00515-EJL, 2015 U.S. Dist. LEXIS 30671, at *37-52 (D. Idaho Mar. 11, 2015); *The Wilderness Soc'y v. U.S. Forest Serv.*, No. CV08-363-E-EJL, 2013 U.S. Dist. LEXIS 153036, at *22-32 (D. Idaho Oct. 22, 2013); *Cent. Sierra Envtl. Res. Ctr. v. U.S. Forest Serv.*, 916 F. Supp. 2d 1078, 1094-98 (E.D. Cal. 2013); *Idaho Conservation League v. Guzman*, 766 F. Supp. 2d 1056, 1071-74 (D. Idaho 2011).

[40] *See also id.* at 932 ("consideration" of the minimization criteria is insufficient; rather, the agency "must apply the data it has compiled to show how it designed the areas open to snowmobile use "with the objective of minimizing'" impacts). Importantly, efforts to *mitigate* impacts associated with a designated OSV system are insufficient to fully satisfy the duty to *minimize* impacts, as specified in the executive orders. *See* Exec. Order 11644, § 3(a) ("Areas and trails shall be *located* to minimize" impacts and conflicts.). Thus, application of the minimization criteria should be approached in two steps: first, the agency locates areas and routes to minimize impacts, and second, the agency establishes site-specific management actions to further reduce impacts. Similarly, the Forest Service may not rely on compliance with the relevant forest plan as a proxy for application of the minimization criteria because doing so conflates separate and distinct legal obligations. *See Friends of the Clearwater*, 2015 U.S. Dist. LEXIS 30671, at *46 ("Merely concluding that the proposed action is consistent with the Forest Plan does not . . . satisfy the requirement that the Forest Service provide some explanation or analysis showing that it considered the minimizing criteria and took some action to minimize environmental damage when designating routes.").

minimize both site-specific and landscape-scale impacts, providing meaningful opportunities for public participation, incorporating the best available scientific information and best management practices (BMPs) for minimizing impacts to particular resources, and accounting for predicted climate change impacts and available resources for monitoring and enforcement.[41]

b. Area designations under a "closed unless designated open" approach

The Forest Service's substantive duty to minimize impacts associated with OSV use applies to both area and trail designations. Minimization of impacts associated with OSV area allocations is particularly important because the OSV rule permits the Forest Service to designate larger areas open to cross-country travel than in the summer-time travel planning context. The rule, however, requires that designated areas be "discrete," "specifically delineated," and "smaller . . . than a ranger district." 36 C.F.R. § 212.1 (definition of "area"). Accordingly, the Forest Service must specifically delineate discrete areas where cross-country travel is permitted. And, as described above, the Forest Service must locate any such areas to *minimize* resource damage and recreational use conflicts. As the Ninth Circuit recently held, the Forest Service must "apply the minimization criteria to *each area* it designate[s] for snowmobile use" and "provide a . . . granular minimization analysis to fulfill the objectives of Executive Order 11644." *WildEarth Guardians*, 790 F.3d at 930-31. Importantly, the agency "cannot rely upon a forest-wide reduction in the total area open to snowmobiles as a basis for demonstrating compliance with the minimization criteria," which are "concerned with the effects of each particularized area." *Id.* at 932. The agency is "under an affirmative obligation to actually show that it aimed to minimize environmental damage when designating . . . areas." *Id.* (quotations and citations omitted). Proper application and implementation of the minimization criteria almost certainly would not result in designation of open areas even close to the size of a ranger district, as sensitive resources and other recreational uses adversely affected by OSV use would most likely be present throughout the area.

Proper designation of areas in compliance with subpart C and the minimization criteria will require most national forests to undergo a paradigm shift in OSV management. In general, forests have allocated vast areas as open to cross-country OSV travel largely by default. According to data obtained by Winter Wildlands Alliance through a 2014 request under the Freedom of Information Act, approximately 94 million acres – or about 60% of national forest lands that receive regular snowfall – are currently open to OSV use, while only about 30 million acres outside of designated wilderness (where motorized use is prohibited by statute) are closed

[41] *See generally* The Wilderness Society, *Achieving Compliance with the Executive Order "Minimization Criteria" for Off-Road Vehicle Use on Federal Public Lands: Background, Case Studies, and Recommendations* (May 2016) (Exhibit VII.1). The Journal of Conservation Planning recently published a literature review and BMPs for OSV management that provide guidelines, based on peer-reviewed science, for OSV designation decisions and implementation actions that are intended to minimize impacts to water quality, soils, vegetation, wildlife, and other recreational uses. Switalski 2016. The Forest Service's National Core BMP Technical Guide also includes relevant BMPs, such as imposing minimum snow depth and season of use restrictions; using applicable best practices when constructing winter trailheads, parking, and staging areas; and using suitable measures to trap and treat pollutants from over-snow vehicle emissions in snowmelt runoff or locating stating areas at a sufficient distance from waterbodies to provide adequate pollutant filtering. USDA Forest Service 2012. The 2012 Planning Rule requires plans to implement these practices. 36 C.F.R. § 219.8(a)(4).

to that use.[42] Subpart C, however, specifically rejects this default "open unless designated closed" approach, and instead requires the Forest Service to "designate" specific areas and trails for OSV use (consistent with the minimization criteria), and prohibits OSV use outside of the designated system. *See* 36 C.F.R. §§ 212.80(a), 212.81(a), 261.14. In other words, subpart C requires forests to make OSV designations under a consistent "closed unless designated open" approach.

To satisfy these legal requirements, the Forest Service must look closely at each forest and designate as open only those discrete, delineated areas that are appropriate for cross-country OSV use and minimize environmental damage and conflicts with other recreational uses. Open areas should have easily enforceable boundaries using topographic or geographic features such as ridgetops, highways, or watershed boundaries. All other areas that are not determined to be appropriate for open designation then must be closed (or limited to designated routes), thus moving the forest into a "closed unless designated open" management regime.

c. Trail designations

As with area designations, the Forest Service must locate any designated routes to *minimize* resource damage and conflicts with other recreational uses. Under the plain terms of the ORV executive orders, the Forest Service must apply the minimization criteria to *all* trails designated for OSV use – even if those trails are located in areas of the forest that would be designated as open to cross-country OSV use. When designated and placed on a map, trails focus the impacts of OSV use to those locations and generally increase the number of OSV users visiting the area. This is particularly true of groomed trails within areas otherwise open to cross-country travel. Groomed trails are desirable for traveling faster and further into remote areas. In addition, grooming often results in widening the footprint of the trail, which wheeled motorized vehicles may then use in summer, resulting in additional impacts and conflicts.

d. Adequate snowpack

The new OSV rule requires designation of areas and routes for OSV use "where snowfall is adequate for that use to occur." 36 C.F.R. § 212.81(a). Particularly with climate change leading to reduced and less reliable snowpack, low-elevation and other areas that lack regular and consistent snowfall should not be designated for OSV use. Closing those areas is necessary to comply with the plain language of the subpart C regulations and with the executive order minimization criteria.

To account for variable snowpack and ensure that OSV use occurs only where and when snowfall is adequate, minimum snow depth restrictions are an important tool to further minimize impacts associated with OSV area and trail designations. The best available science shows that minimum snow depths should be at least 18 inches for cross-country travel and 12 inches for travel on groomed trails (Switalski 2016). These depths are generally sufficient to minimize

[42] Winter Wildlands Alliance, *Winter Recreation on National Forest Lands: A Comprehensive Analysis of Motorized and Non-Motorized Opportunity and Access*, p. 4 & Fig. 3 (2015), *available at* http://winterwildlands.org/wp-content/uploads/2015/06/2015-Winter-Rec-Report.pdf and attached as Exhibit VII.2.

impacts to water quality, soils, and vegetation and to buffer for variable snow conditions (e.g., while a shaded trailhead may have 12 inches of snow, south-facing slopes further up the trail may have little or no snow). The Forest Service should also address its plans to enforce minimum snow depth restrictions, including protocols for monitoring snow depths, communicating conditions with the public, and implementing emergency closures when snowpack falls below the relevant thresholds. Minimum snow depths measurements should be taken at established locations that are representative of varying snow depths based on factors such as wind, orientation, slope, tree cover, etc. and depths should be reported regularly on the forest website and posted at popular access points.

In addition, forests should clearly identify season of use restrictions based on wildlife needs, water quality considerations, average snow depth figures, and other relevant information, with those restrictions serving as bookends, and minimum snow depth requirements providing an additional limitation on use. 36 C.F.R. § 212.81(a) (OSV rule permits agency to designate areas or trails by "time of year" to tailor designation decisions to account for snowfall patterns).

e. Existing decisions

Upon public notice, subpart C permits the Forest Service to grandfather previous decisions made with public involvement that restrict OSV use to designated areas and routes. 36 C.F.R. § 212.81(b). Prior to grandfathering existing winter travel management decisions by adopting them on an OSV use map, however, the Forest Service must ensure that those decisions were subject to the executive order minimization criteria and other relevant legal requirements.

Most critically, previous decisions must have been subject to the minimization criteria, and the administrative records for the decisions must demonstrate that the agency applied the criteria when making any OSV area or route designations. If the previous decisions were not subject to the minimization criteria, the Forest Service may not adopt them on its OSV use map. Similarly, the Forest Service may not adopt previous decisions that rely on an "open unless designated closed" policy or fail to designate discrete open areas. The Forest Service also must ensure that previous decisions are not outdated. Older decisions likely did not account for the increased speed, power, and other capabilities of current OSV technology, which allow OSVs to travel further and faster into the backcountry and to access remote areas that were previously inaccessible. Older decisions also may not account for new scientific information on sensitive wildlife and other forest resources and how they are affected by OSV use. They may not account for current recreational use trends and increasing conflict between motorized and non-motorized winter backcountry users. And they may not account for the current and predicted impacts of climate change, which is, among other things, reducing and altering snowpack and increasing the vulnerability of wildlife and other resources to OSV-related impacts. Without this information, the Forest Service cannot demonstrate how those previous decisions minimize impacts based on current circumstances and science.

2. The draft plans fail to provide adequate direction on OSV use

Our understanding is that the Inyo, Sierra, and Sequoia National Forests intend to conduct winter travel management planning processes at some point following the forest plan revisions. *See* DEIS at 465 (suggesting that OSV use will be subject to site-specific analysis during future

implementation-level travel planning). We support this approach, provided that the revised forest plans provide an adequate programmatic framework – including suitability determinations, winter-specific recreational opportunity spectrum (ROS) classifications, minimum snow depth restrictions, and other programmatic direction – for management of OSV use and subsequent implementation-level travel planning that will designate particular areas and routes based on the minimization criteria and other relevant regulatory requirements. The current forest planning process is the appropriate place to consider the significant impacts associated with OSV use in the broader recreation context and to provide for sustainable recreation during the winter season, as required by the 2012 Planning Rule. 36 C.F.R. § 219.10(b)(1)(i). This is particularly important given the increasing numbers of participants in both motorized and human-powered winter back-country recreation, and the corresponding increase in conflicts between skiers, snowshoers, and snowmobilers in many areas. Part of this conflict is due to the disparity in non-motorized opportunities available to skiers and snowshoers on national forests, as compared to snowmobilers. *See* Exhibit VII.2, *Winter Recreation on National Forest Lands*. Unfortunately, the draft plans fail to provide an adequate framework for management of OSV use, and the DEIS fails to analyze the impacts of OSV use on forest resources and recreational opportunities.

Vast portions of the Inyo, Sierra, and Sequoia National Forests are currently open to cross-country OSV travel largely by default.[43] Despite the significant impacts of OSV use in those areas on sensitive wildlife, watershed, soils, vegetation, and non-motorized recreation, the DEIS includes only a single paragraph addressing OSVs and suggesting that OSV use will be subject to site-specific analysis during future implementation-level travel planning (DEIS at 465). While site-specific analysis is a necessary component of future travel planning efforts, the DEIS fails to analyze the larger, programmatic impacts of OSV use across the forests. Adequate NEPA analysis of this issue will require preparation of a revised or supplemental DEIS. *See* 40 C.F.R. § 1502.9(a) & (c). Moreover, the draft plans provide no direction to ensure that site-specific travel planning will take place within a reasonable time-frame. The Draft Sequoia Plan includes in its list of "Proposed and Possible Actions" "[c]omplete Subpart C . . . , providing equitable opportunities for both motorized and quiet winter recreation opportunities"(Sequoia Draft Plan at 137). To ensure timely compliance with the new OSV rule, the final plans should provide an objective that implementation-level subpart C planning will be completed within three years of forest plan approval.

Nor do the draft plans provide an adequate framework for future site-specific travel planning. For instance, forest plans are an appropriate place to set minimum snow depth and other restrictions designed to help buffer the impacts of OSV use. *See* subsection 1(d), above. Thus, we are deeply disappointed to see the 18-inch minimum snow depth standard that was included in the Proposed Action and consistent with the best available scientific information completely removed from the Inyo and Sequoia draft plans, and weakened to a guideline in the Sierra draft plan, with a loophole for whenever "site-specific conditions allow to avoid ground disturbance." Sierra Draft Plan at 104 (REC-FW-GDL-09). The final plans should include a standard setting a

[43] 972,954 acres of the Inyo are currently open, while only 43,947 acres outside designated wilderness are closed; 760,657 acres of the Sierra are currently open, while only 2,000 acres outside designated wilderness are closed; and 450,228 acres of the Sequoia are currently open, while only 42,381 acres outside designated wilderness are closed. *Id.*

minimum snow depth of 18 inches for cross-country OSV travel, consistent with the best available scientific information (Switalski 2016).

Forest plans should also include meaningful suitability determinations for OSVs to focus future site-specific winter travel planning efforts. *See* FSH 1909.12, ch. 20, § 22.15 ("Plans may include suitability or nonsuitability statements for uses such as . . . cross-country over-snow vehicle use . . . ."). We are pleased to see some limited non-suitability determinations for OSVs in the draft plans, including findings that OSVs are unsuitable in recommended wilderness, Research Natural Areas, and the Ancient Bristlecone Pine Forest on the Inyo. DEIS at 465; Inyo Draft Plan at 55 (MA-RWLD-SUIT-03), 81 (DA-ABPF-SUIT-05), 84 (DA-RNA-SUIT-02); Sierra Draft Plan at 76 (DA-RNA-SUIT-02); Sequoia Draft Plan at 77 (DA-RNA-SUIT-02). The final forest plans should greatly expand on these suitability determinations to provide a more robust framework for implementation-level travel planning. Suitability determinations should address more than legal suitability (e.g., OSVs are unsuitable in designated wilderness because the Wilderness Act prohibits motorized uses), and should also address functional suitability and operability. For instance, steep slopes and windswept ridgelines, low elevation areas without adequate snowpack, areas with dense tree cover, and important habitat for wintering wildlife should be found unsuitable. In addition, the final forest plans should make clear that OSVs will not necessarily be permitted in all suitable areas. *See* FSH 1909.12, ch. 20, § 22.15(1) (a suitability determination "is not a commitment to allow such use but only an indication that the use might be appropriate"). Rather, suitable areas are a starting point for conducting site-specific travel planning to designate particular areas and trails – in accordance with the minimization criteria – within suitable areas that are open to OSV use. Finally, the final plans should include an objective that areas found unsuitable for OSVs will be subject to appropriate closure orders within one year of plan approval.

Another key component of programmatic forest plan direction on OSV use is adoption and implementation of winter-specific recreational opportunity spectrum (ROS) classifications. As the Flathead National Forest recently recognized in its draft revised forest plan:

> [ROS] settings change as snow blankets the Forest's landscapes. While some settings become less accessible and more remote, others change from non-motorized to accommodating [OSVs]. Although the full range of settings, primitive to rural, are still present, their location, distribution and percentages change significantly during the winter months (

Flathead National Forest, Draft Revised Forest Plan at 62. The current ROS classifications are best suited for managing summertime uses, with many areas traditionally classified as backcountry motorized, semi-primitive motorized, and roaded natural providing high-quality and popular opportunities for non-motorized recreation in the wintertime. For example, many visitors enjoy the opportunity to cross-country ski on snow-covered forest roads without having to contend with OSV activity in the area. At the same time, skiers and snowshoers do not always mind sharing trails or areas with OSVs *so long as they expect to encounter motorized uses*. ROS classifications provide a good tool for visitors to determine where on the forest they should go to achieve their desired experience. However, forest visitors' experiences, expectations, and desires

differ in winter as compared to summer, and ROS classifications should account for those distinctions.

The Forest Service Land Management Planning Handbook recognizes that development and implementation winter-specific ROS may be necessary:

> Desired winter recreation opportunity spectrum classes can be developed to depict changes in the location, mix and distribution of setting attributes, access, and associated opportunities (both motorized and nonmotorized). In doing so, distinct seasonal changes in the recreation settings and opportunities can be integrated with other seasonally relevant multiple uses, resource values and management objectives, such as protecting crucial winter range, providing access to key winter destinations, or limiting access to avalanche prone areas (

FSH 1909.12, ch. 20, § 23.23a(1)(d)(1). The winter ROS categories included in the Flathead Draft Plan provide a good example for what those classifications might look like:

> Primitive and semi-primitive non-motorized backcountry settings offer solitude and quiet recreation for those accessing the forest on skis, snowshoes, or snow boards. Semi-primitive motorized settings cover large expanses of the forest, offering over-snow vehicles the chance to explore areas of the forest that are often non-motorized in the summer months. Roaded natural and rural settings continue to serve as convenient connections to surrounding communities and easy access to visitors. Facilities are operated to provide user comfort. Groomed motorized and non-motorized trails offer users the chance to get outside for a day trip or take longer, cross-country excursions. Rental cabins are available although some require a ski in or over-snow vehicle trip to access them.
>
> **01** Winter recreation settings provide a range of opportunities as described by the recreation opportunity spectrum. . . .
>
> **02** Winter primitive recreation opportunity spectrum settings are large, remote, wild, and predominately unmodified. Winter primitive recreation opportunity spectrum settings provide quiet solitude away from roads, and people. There is no motorized activity and little probability of seeing other people. Constructed trails that are evident in the summer months are covered by snow, making these settings appear even more natural and untouched by human management.
>
> **03** Winter semi-primitive non-motorized recreation opportunity spectrum settings provide backcountry skiing, snowboarding, and snowshoeing opportunities. Trails are un-groomed and often not marked. Rustic facilities, such as historic cabins, yurts may exist but are rare.
>
> **04** Winter semi-primitive motorized recreation opportunity spectrum settings provide backcountry skiing and snowmobiling opportunities. Routes are typically un-groomed but are often signed and marked. There are vast areas to travel cross-country in designated

areas, offering visitors an opportunity for exploration and challenge. Occasionally, historic rental cabins are available for overnight use and warming huts are available for short breaks.

05 Winter roaded natural recreation opportunity spectrum settings support higher concentrations of use, user comfort, and social interaction. The road system is plowed and accommodates sedan travel. Winter trails are routinely groomed and may have ancillary facilities such as warming huts and restrooms. System roads and trails often provide staging to adjacent backcountry settings (primitive, semi-primitive non-motorized, semi-primitive motorized). Guided motorized over-snow vehicle use, dog sledding, skiing, and snowshoeing may also be present.

06 Winter rural recreation opportunity spectrum settings provide high-use ski areas such as Blacktail Mountain and Whitefish Mountain Resort. These areas are accessed from paved and plowed roads and are generally close to population centers. User comfort facilities such as toilets, restaurants, heated shelter facilities, and information and education are commonly present. Parking areas are large and plowed. Entry points and routes are signed and direct over-snow vehicles to adjacent roaded natural and semi-primitive motorized settings. Non-motorized trails are also typically groomed for Nordic skiing. Rural winter settings provide access for communities and families to celebrate holidays, conduct racing events, and skiing

Flathead National Forest, Draft Revised Forest Plan at 62-63. The final plans for the Inyo, Sierra, and Sequoia should develop and implement similar winter ROS classifications.

Even with a winter-specific ROS classification system, it is important to remember that OSV area designations and ROS categories are distinct, albeit related, management tools. While motorized ROS classifications provide a good starting point for where to designate OSV areas and trails, the Forest Service should not assume that OSV use is appropriate across the entirety of those areas. Instead, as part of implementation-level winter travel management planning, the agency needs to designate discrete, specifically delineated areas and trails *within* the motorized ROS classifications and areas suitable for OSV use that are located to minimize environmental damage and conflicts with other recreational uses.

Recommendations: The final plans should provide a programmatic framework for management of OSV use and subsequent implementation-level winter travel planning that will designate particular areas and routes based on the minimization criteria and other relevant regulatory requirements. To provide for sustainable winter recreation, the final plans should include, at a minimum:

- An objective that implementation-level subpart C planning will be completed within three years of forest plan approval;
- A standard setting a minimum snow depth of 18 inches for cross-country OSV travel, consistent with the best available scientific information;
- Additional suitability determinations for OSV use that address both legal suitability and practical suitability based on terrain, snowpack, wildlife habitat, and other conditions that

impact OSV travel, and an objective that unsuitable areas will be subject to appropriate closure orders within one year of plan approval;

- Winter-specific ROS classifications; and
- Clear statements that subsequent area and route designations will be consistent with suitability determinations and winter ROS classifications, but that all suitable, motorized areas will not necessarily be open to OSV use; instead, the forests will designate discrete open areas and trails within those areas that are located to minimize resource impacts and conflicts with other recreational uses.

In addition, the impacts of OSV use on forest resources and recreational experiences and opportunities must be meaningfully analyzed in the EIS. This will require a revised or supplemental DEIS.

C. Management of Mechanized Uses

Mountain biking is an expanding use throughout the Sierra Nevada and nationally. Our scoping comments explained why mountain bikes should be limited to a system of roads, trails, and areas that is designated through environmental and public review. This reasonable recommendation was not addressed in the DEIS, and the draft plans provide no direction on mountain biking.

Recommendations: Limit mechanized uses such as mountain biking to a designated system.

D. Tree Mortality

The draft plans and DEIS fail to address the numerous and potentially significant impacts of tree mortality on recreation. For instance, recreational facilities and access roads may need to be closed or relocated temporarily or permanently due to public safety concerns associated with dead and falling trees. User preferences may also shift from areas of high tree mortality to areas with lower tree mortality. In other words, the forests must anticipate and plan for significant redistribution of recreation opportunities, trends, and access. Recreation plan components and descriptions of "recreation places" should address these issues, and they must be thoroughly analyzed in the EIS.

Recommendations: Limit mechanized uses such as mountain biking to a designated system.

VIII. Wild and Scenic Rivers

A. Inyo Draft Plan

We generally support the findings for 128.3 miles of rivers and streams determined eligible for Wild and Scenic protection as documented in DEIS Vol. 2, Appendix C: Wild and Scenic Rivers Evaluation for the Inyo, Sequoia and Sierra National Forests. However, there are inaccuracies in the evaluation that should be rectified, not all the outstandingly remarkable values of some of the eligible streams were accurately identified, and some streams were mistakenly determined ineligible and should be added to the list of eligible streams.

We recommend that the eligibility of Birch Creek, Dexter and Wet Canyons, George Creek, Independence Creek, Little Hot Creek, Mammoth Creek, lower Mill Creek, Nine Mile Creek, O'Harrel Canyon Creek, Olancha Creek, lower Parker Creek, and lower Rush Creek be re-evaluated and determined eligible. We believe that these streams are free flowing and possess one or more outstandingly remarkable values. Please review our Appendix C comments as this is not a comprehensive summary of the evaluation process outlined in Appendix C (Exhibit VIII.1).

1. Wild and Scenic Rivers Desired Conditions, Standards, and Guidelines – Standards (MA-WSR-STD) (Inyo draft plan, pp. 55-57)

Add this standard: "The free flowing condition, water quality, and specific outstandingly remarkable values of designated wild and scenic rivers shall be protected and enhanced. Any development shall be consistent with the river's classification, and management consistent with a current comprehensive river management plan."

Rationale: This is similar to Desired Condition 01, except the words "are" in the first sentence and "is" in the second sentence have been replaced with "shall be." This needs to be a standard because Desired Conditions are not binding.

Add this standard: "Where flows are or may be adversely affected by upstream diversions or adjacent groundwater extraction, initiate application to the State Water Resources Control Board to quantify and affirm the instream flow and federal water right needed to fulfill the purposes of the Act."

Rationale: This is the only way to protect the free flowing character of designated and eligible rivers that may be threatened by upstream diversions and adjacent groundwater extraction.

Add this standard: "Where application of federal hydroelectric licenses for existing or new projects could affect designated rivers and streams, use the 4(e) conditioning authority to ensure protection and enhancement of free flowing character and outstandingly remarkable values."

Rationale: Designated wild and scenic rivers could be adversely impacted by the renewal of or new licenses for existing or proposed hydroelectric projects upstream and downstream of designated rivers and streams. This standard ensures their protection.

Add this standard: "Existing comprehensive river management plans that are more than 20 years old are updated to reflect and address current conditions and use. New comprehensive river management plans are completed for rivers that lack such plans."

Rationale: The existing comprehensive river management plan (CRMP) for the designated segments of the North and South Forks Kern WSRs on the Inyo Forest was completed 22 years ago. Physical conditions have changed, as have levels and types of resource and visitor use. The final Inyo National Forest Assessment (2014) documented livestock grazing impacts on meadows within the WSR zone for the North and South Forks (pg. 187). This calls for at least an update of the 1994 CRMP to address and rectify these impacts. The Owens River Headwaters

and Cottonwood Creek WSRs were designated by Congress in 2009. CRMPs for these relatively recent designations have yet to be completed, despite the fact that federal law requires the completion of such plans within three years of designation. The upper Deadman Creek segment of the Owens River Headwaters WSR was not found eligible by the Forest Service in its previous inventory and has no documentation of its outstandingly remarkable values, even though it was designated by Congress. As a practical matter, the Forest Service cannot comply with the basic direction of protecting outstandingly remarkable values of this segment until the agency evaluates the segment to identify its specific outstandingly remarkable values.

Revise Standard 03 to state: "Where river management direction has not been developed, minor improvements can be made to existing structures in the recreation and scenic segments. Major improvements require completion or update of the comprehensive river management plan."

Rationale: Major improvements consistent with classification should be allowed only when an updated or new comprehensive river management plan is completed to provide needed up to date river management direction and to ensure protection of water quality, free flowing character, and outstandingly remarkable values.

Revise Standard 04 to state: "In recreation and scenic segments, permit expansion of structural improvements outside of designated wilderness provided the meet assigned integrity objectives, allow for user access, are consistent with classification and the updated or newly completed comprehensive river management plan; and avoid adverse impacts to water quality, free flowing character, and outstandingly remarkable values."

Revise Standard 05 to state: "Within the wild segment, limit structural improvements to existing structures and only when consistent the updated or new comprehensive river management plan; and avoid adverse impacts to water quality, free flowing character, and outstandingly remarkable values."

Rationale: Any action taken within a WSR corridor should be consistent with classification and management direction provided in existing up to date CRMPs and avoid adverse impacts to water quality, free flowing character, and outstandingly remarkable values.

Make Guideline 05 into a Standard and revise to state: "Identify and determine the validity of all existing mining claims on public lands when a plan of operations is submitted."

Rationale: Mining in wild segments is only allowed on valid existing claims. Any new claims or changes in operations on existing claims in scenic and recreational segments should also be subject to validation. This standard should be applicable to all designated rivers, regardless of classification.

2. Eligible or Recommended Wild and Scenic Rivers – Standards (MA-EWSR-STD) (Inyo draft plan, p. 57)

Add this Standard: "Where flows are or may be adversely affected by upstream diversions or adjacent groundwater extraction, initiate application to the State Water Resources Control Board to quantify and affirm the instream flow and federal water right needed to fulfill the purposes of the Act."

Rationale: This is the primary method for protecting the free flowing character of designated and eligible rivers.

Add this standard: "Where application of federal hydroelectric licenses for existing or new projects could affect eligible and suitable rivers and streams, use the 4(e) conditioning authority to ensure protection and enhancement of free flowing character and outstandingly remarkable values."

Rationale: Eligible and suitable wild and scenic rivers could be adversely impacted by the renewal or licenses for existing or proposed hydroelectric projects upstream and downstream of eligible and suitable rivers and streams. This standard ensures their protection.

Add this Guideline: "Consider acquiring non-federal land and easements to protect water quality, free flowing character, outstandingly remarkable values, and potential classification."

Rationale: Acquisition of inholdings within eligible WSR corridors should be a priority to protect rivers values from inappropriate development of inholdings within eligible WSR corridors.

3. Figure 8. Wild and scenic river status of the Inyo National Forest (map) (Inyo draft plan, p. 131)

Public review and understanding would be vastly improved if this map included the names of the eligible segments, existing WSRs, as well as the background hydrological system (to better facilitate understanding of the connections to non-eligible streams). More detailed maps of each eligible segment showing the proposed river corridors, segments, and classifications should be provided in Appendix C. Considering the 15 year or more lifespan of the FPRs, it is essential that segment details be fully documented in the FPRs so that the agency can fully meet its responsibility to protect their free flowing condition and outstandingly remarkable values.

4. Proposed and Probable Actions – Wild and Scenic Rivers (Inyo draft plan, p. 145)

We strongly support the action: "Complete comprehensive river management plans for the newly designated Cottonwood Creek and Upper Owens River Wild and Scenic Rivers. This should be considered a Proposed and not Probable Action, since the Act requires that CRMPs be completed within three years of designation (these streams were designated in 2009). We recommend that the following Proposed Actions be added to the section:

- Coordinate with the BLM on the development of the Cottonwood Creek CRMP.

- Include in the Upper Owens Wild and Scenic River CRMP, identification of the outstandingly remarkable values of Deadman Creek upstream of its confluence with Glass Creek.

The first additional Proposed Action recognizes that the BLM manages the lower segment of Cottonwood Creek and the CRMP should be developed jointly with the BLM. The second Proposed Action recognizes that the Forest Service did not find Deadman Creek to be eligible in the 1993 evaluation but Congress designated it in 2009. This puts the Forest Service in the ambiguous position of having to protect unspecified outstandingly remarkable values. Our scoping comments provided details on the outstandingly remarkable values of upper Deadman Creek. The other and more immediate way to resolve this issue is to evaluate upper Deadman Creek when the draft Appendix C Evaluation is revised in response to these and other public comments.

5. Appendix G: Existing Resource Plans (Inyo draft plan, p. 187)

As previously noted, we believe and strongly recommend that the Inyo FPR include in its Proposed Actions an update of the 22-year old North and South Forks Kern Wild and Scenic River Plan. Given the mandate to protect and enhance the free flowing condition, outstandingly remarkable values, water quality, and classification of designated rivers, this should be considered a Proposed and not Probable Action.

B. Sequoia Draft Plan

As detailed in our draft DEIS Vol. 2, Appendix C comments, we believe that the Sequoia Forest WSR evaluation is inadequate. We believe that rivers and streams on the Sequoia Forest should be re-evaluated and several additional streams determined eligible, including more segments of the North Fork Middle Fork Tule River, as well as Salmon, Trout, Rattlesnake, Brushy, Dry Meadow, Freeman Creek, and Mill Flat Creeks. Please review our comprehensive comments on draft Appendix C.

1. Wild and Scenic Rivers Desired Conditions, Standards, and Guidelines – Standards (MA-WSR-STD) (Sequoia draft plan, p. 55-57)

Add this standard: "The free flowing condition, water quality, and specific outstandingly remarkable values of designated wild and scenic rivers shall be protected and enhanced. Any development shall be consistent with the river's classification, and management consistent with a current comprehensive river management plan."

Rationale: This is similar to Desired Condition 01, except the words "are" in the first sentence and "is" in the second sentence have been replaced with "shall be." This needs to be a standard because Desired Conditions are not binding.

Add this standard: "Where flows are or may be adversely affected by upstream diversions or adjacent groundwater extraction, initiate application to the State Water Resources Control Board to quantify and affirm the instream flow and federal water right needed to fulfill the purposes of the Act."

Rationale: This is the only way to protect the free flowing character of designated and eligible rivers that may be threatened by upstream diversions and adjacent groundwater extraction.

Add this standard: "Where application of federal hydroelectric licenses for existing or new projects could affect designated rivers and streams, use the 4(e) conditioning authority to ensure protection and enhancement of free flowing character and outstandingly remarkable values."

Rationale: Designated wild and scenic rivers could be adversely impacted by the renewal of or new licenses for existing or proposed hydroelectric projects upstream and downstream of designated rivers and streams. This standard ensures their protection.

Add this standard: "Existing comprehensive river management plans that are more than 20 years old are updated to reflect and address current conditions and use. New comprehensive river management plans are completed for rivers that lack such plans."

Rationale: The existing comprehensive river management plan (CRMP) for the designated segments of the North and South Forks Kern WSRs on the Sequoia Forest was completed 22 years ago. Physical conditions have changed, as have levels and types of resource and visitor use. The final Sequoia National Forest Assessment (2014, pg. 205) documented "escalated" recreation impacts to vegetation and habitat, as well as overcrowding, congested parking and poor sanitation practices on North Fork Kern segment 4. The Assessment refers to an Upper Kern River Action Plan. If completed and proven effective, this Action Plan should be incorporated into an update of the CRMP.

Add this Standard: "Identify and determine the validity of all existing mining claims on public lands when a plan of operations is submitted."

Rationale: Mining in wild segments is only allowed on valid existing claims. Any new claims or changes in operations on existing claims in scenic and recreational segments should also be subject to validation. This standard should be applicable to all designated rivers, regardless of classification.

Make Guideline 02 into Standard 03 and revise to state: "Close dispersed campsites that are adversely affecting water quality and outstandingly remarkable values."

Rationale: The Forest Service is required by law to protect water quality and outstandingly remarkable values. This is not a discretionary responsibility and should not be treated as a Guideline.

2. Eligible or Recommended Wild and Scenic Rivers – Standards (MA-EWSR-STD) (Sequoia draft plan, p. 57)

Add this Standard: "Where flows are or may be adversely affected by upstream diversions or adjacent groundwater extraction, initiate application to the State Water Resources Control Board to quantify and affirm the instream flow and federal water right needed to fulfill the purposes of the Act."

Rationale: This is the primary method for protecting the free flowing character of designated and eligible rivers.

Add this standard: "Where application of federal hydroelectric licenses for existing or new projects could affect eligible and suitable rivers and streams, use the 4(e) conditioning authority to ensure protection and enhancement of free flowing character and outstandingly remarkable values."

Rationale: Eligible and suitable wild and scenic rivers could be adversely impacted by the renewal or licenses for existing or proposed hydroelectric projects upstream and downstream of eligible and suitable rivers and streams. This standard ensures their protection.

Add this Guideline: "Consider acquiring non-federal land and easements to protect water quality, free flowing character, outstandingly remarkable values, and potential classification."

Rationale: Acquisition of inholdings within eligible WSR corridors should be a priority to protect rivers values from inappropriate development of inholdings within eligible WSR corridors.

3. Figure 13. Wild and scenic river status of the Sequoia National Forest (map) (Sequoia draft plan, p. 125)

This map should depict the two eligible river segments (North Fork Tule River, North Fork Middle Fork Tule River) located within the Giant Sequoia National Monument. The 2013 GSNM Plan did not address eligible WSRs at all. These eligible streams and three others located elsewhere on the Sequoia National Forest were never subject to public review. They should at least be recognized in the Sequoia FPR, similar to how the Wilderness Evaluation has recognized areas in the GSNM.

Public review and understanding would be vastly improved if this map included the names of the eligible segments, existing WSRs, as well as the background hydrological system (to better facilitate understanding of the connections to non-eligible streams). More detailed maps of each eligible segment showing the proposed river corridors, segments, and classifications should be provided in Appendix C. Considering the 15 year or more lifespan of the FPRs, it is essential that segment details be fully documented in the FPRs so that the agency can fully meet its responsibility to protect their free flowing condition and outstandingly remarkable values.

4. Proposed and Probable Actions – Wild and Scenic Rivers (Sequoia draft plan, p. 142)

The second action should be revised to state: Update the comprehensive river management plan for the North and South Forks Kern Wild & Scenic River.

Rationale: The 2013 Final Sequoia Forest Assessment (pg. 205) identified "escalated' recreation-associated impacts, including effects on vegetation and habitat, and overcrowding, congested parking, and poor sanitation. The narrative suggests that this was addressed in an Upper Kern River Action Plan, but this plan is not apparently available on the internet. If the plan was completed and has proven effective, it should be incorporated into an updated North and South Forks Kern Wild & Scenic River CRMP. Given the mandate to protect and enhance the free flowing condition, outstandingly remarkable values, water quality, and classification of designated rivers, this should be considered a Proposed and not Probable Action.

C. Sierra Draft Plan

The Sierra National Forest is to be commended for conducting an expansive and comprehensive WSR evaluation. We generally support the evaluation with some important changes. Two notable streams not identified as eligible in the Appendix C evaluation include lower Dinkey Creek and a middle segment of Granite Creek (upstream and downstream of existing eligible segments). We believe these streams are indeed eligible and should be included in the FPR and a revised Appendix C. Please refer to our detailed comments concerning DEIS Vol. 2, Appendix C.

1. Wild and Scenic Rivers Desired Conditions, Standards, and Guidelines – Standards (MA-WSR-STD) (Sierra draft plan, p. 57)

Add this standard: "The free flowing condition, water quality, and specific outstandingly remarkable values of designated wild and scenic rivers shall be protected and enhanced. Any development shall be consistent with the river's classification, and management consistent with a current comprehensive river management plan."

Rationale: This is similar to Desired Condition 01, except the words "are" in the first sentence and "is" in the second sentence have been replaced with "shall be." This needs to be a standard because Desired Conditions are not binding.

Add this standard: "Where flows are or may be adversely affected by upstream diversions or adjacent groundwater extraction, initiate application to the State Water Resources Control Board to quantify and affirm the instream flow and federal water right needed to fulfill the purposes of the Act."

Add this standard: "Where application of federal hydroelectric licenses for existing or new projects could affect designated rivers and streams, use the 4(e) conditioning authority to ensure protection and enhancement of free flowing character and outstandingly remarkable values."

Rationale: Designated wild and scenic rivers could be adversely impacted by the renewal of or new licenses for existing or proposed hydroelectric projects upstream and downstream of designated rivers and streams. This standard ensures their protection.

Rationale: This is the only way to protect the free flowing character of designated and eligible rivers that may be threatened by upstream diversions and adjacent groundwater extraction.

Add this standard: "Existing comprehensive river management plans that are more than 20 years old are updated to reflect and address current conditions and use."

Rationale: The existing comprehensive river management plans (CRMPs) for the designated segments of the Merced and Kings WSRs on the Sierra Forest were completed more than 20 years ago. Physical conditions have changed, as have levels and types of resource and visitor use. The final Sierra National Forest Assessment (2014, pgs. 204-205) documented increases in recreational demand and mining claims, gang activity and marijuana gardens, high use leading to trash and sanitation issues, and less sustainable dispersed camping due to heavier human pressures. All of these critical issues and proposed actions to resolve them should be addressed in updated CRMPs for the Merced and Kings WSRs.

Add this Standard: "Identify and determine the validity of all existing mining claims on public lands when a plan of operations is submitted."

Rationale: Mining in wild segments is only allowed on valid existing claims. Any new claims or changes in operations on existing claims in scenic and recreational segments should also be subject to validation. This standard should be applicable to all designated rivers, regardless of classification.

Make Guideline 02 into Standard 03 and revise to state: "Close dispersed campsites that are adversely affecting water quality and outstandingly remarkable values."

Rationale: The Forest Service is required by law to protect water quality and outstandingly remarkable values. This is not a discretionary responsibility and should not be treated as a Guideline.

2. Eligible or Recommended Wild and Scenic Rivers – Standards (MA-EWSR-STD) (Sierra draft plan, p. 57)

Add this Standard: "Where flows are or may be adversely affected by upstream diversions or adjacent groundwater extraction, initiate application to the State Water Resources Control Board to quantify and affirm the instream flow and federal water right needed to fulfill the purposes of the Act."

Rationale: This is the primary method for protecting the free flowing character of designated and eligible rivers.

Add this standard: "Where application of federal hydroelectric licenses for existing or new projects could affect eligible and suitable rivers and streams, use the 4(e) conditioning authority to ensure protection and enhancement of free flowing character and outstandingly remarkable values."

Rationale: Eligible and suitable wild and scenic rivers could be adversely impacted by the renewal or licenses for existing or proposed hydroelectric projects upstream and downstream of eligible and suitable rivers and streams. This standard ensures their protection.

Add this Guideline: "Consider acquiring non-federal land and easements to protect water quality, free flowing character, outstandingly remarkable values, and potential classification."

Rationale: Acquisition of inholdings within eligible WSR corridors should be a priority to protect rivers values from inappropriate development of inholdings within eligible WSR corridors.

3. Figure 13. Wild and scenic river status of the Sierra National Forest (map) (Sierra draft plan, p. 127)

Public review and understanding would be vastly improved if this map included the names of the eligible segments, existing WSRs, as well as the background hydrological system (to better facilitate understanding of the connections to non-eligible streams). More detailed maps of each eligible segment showing the proposed river corridors, segments, and classifications should be provided in Appendix C. Considering the 15 year or more lifespan of the FPRs, it is essential that segment details be fully documented in the FPRs so that the agency can fully meet its responsibility to protect their free flowing condition and outstandingly remarkable values.

4. Appendix B. Proposed and Probable Actions – Designated Areas (Sierra draft plan, p. 141)

The second the last bullet point should be revised to state: "Update the comprehensive river management plans for the Merced, South Fork Merced, Kings, and South and Middle Forks Kings wild and scenic rivers."

Rationale: The final Sierra National Forest Assessment (2014, pgs. 204-205) documented increases in recreational demand and mining claims, gang activity and marijuana gardens, high use leading to trash and sanitation issues, and less sustainable dispersed camping due to heavier human pressures. All of these critical issues and proposed actions to resolve them should be addressed in updated CRMPs for the Merced and Kings WSRs. Given the mandate to protect and enhance the free flowing condition, outstandingly remarkable values, water quality, and classification of designated rivers, this should be considered a Proposed and not Probable Action.

D. Comments Pertaining to the DEIS, Volume 1, Chapters 1-4 Comments

1. Features Common to Alternatives B, C, and D; Wild and Scenic Rivers (DEIS, p. 18)

This section notes that a new plan component is added for the management of eligible and suitable wild and scenic rivers. We believe that the standards and guidelines for eligible and suitable rivers in each draft plan are inadequate to ensure protection of free flowing character and outstandingly remarkable values as required by the Forest Service Handbook (FSH). Additional standards and guidelines are recommended for each forest. Please refer to our plan-specific comments.

2. Table 1. Management areas by alternative, Inyo National Forest (DEIS, p. 46)

This Table claims that there are 17.4 miles of "Designated Wild and Scenic Rivers" on the Inyo Forest. This mileage number appears to reflect the segment of Cottonwood Creek on the Inyo Forest designated by Congress in 2009. It does not include 19.5 miles of the Owens River Headwaters also designated in 2009 or segments of the North and South Forks Kern designated in 1987.

3. Eligible and Suitable Wild and Scenic Rivers, Consequences Common to all Alternative (DEIS, p. 529)

This section summarizes the comprehensive inventory and evaluation of potential wild and scenic rivers conducted as part of the plan revision process. Please refer to our detailed comments on DEIS Vol. 2, Appendix C in regard to the adequacy of this process.

4. Analytical Conclusions, Inyo National Forest (DEIS, p. 531)

Re-evaluation of its previous inventory, resulted in a modest increase in the number of rivers and streams determined eligible. We believe that new information warrants re-evaluation of a select number of streams currently considered ineligible, including segments of Birch Creek, Dexter and Wet Canyons, George Creek, Independence Creek, Little Hot Creek, Mammoth Creek, Mill Creek, Nine Mile Creek, O'Harrel Canyon Creek, Olancha Creek, Parker Creek, Rush Creek. In addition, some details of eligible streams require correction or augmentation. Please refer to our detailed comments on DEIS Vol. 2, Appendix C in regard to the adequacy of this process.

5. Analytical Conclusions, Sequoia National Forest (DEIS, p. 532)

A comprehensive inventory and evaluation may indeed have already been completed on the Sequoia Forest prior to the plan revision process, but this inventory and evaluation was never subject to public scoping or comment. The documentation of this previous process is not posted on the Forest Plan web site and is not readily available for public review (a reviewer had to specifically request the documentation). Further, there are numerous problems associated with the previous inventory/evaluation that we believe led to the conclusion that no streams or rivers

are eligible beyond those identified in the previous process. We believe that a number of additional streams on the Sequoia are indeed eligible, including segments of Salmon Creek, Trout Creek, Dry Meadow Creek, Brush Creek, Fish Creek, Mill Flat Creek, and Rattlesnake Creek. In addition, some details of eligible streams require correction or augmentation. Please refer to our detailed comments on DEIS Vol. 2, Appendix C in regard to the adequacy of this process.

6. Analytical Conclusions, Sierra National Forest (DEIS, p. 532)

The Sierra National Forest deserves recognition for its comprehensive inventory and evaluation and its extensive eligibility findings. Nevertheless, we believe that some key stream segments (most notably lower Dinkey Creek and a middle segment of Granite Creek) were inexplicably found ineligible. We believe that reconsideration of these segments is warranted. Please refer to our detailed comments on DEIS Vol. 2, Appendix C in regard to the adequacy of this process.

7. Tribal Relations and Uses, Analysis and Methods, Indicators and Measures (DEIS, p. 554)

This section states: "However, designated areas located in the plan area (such as, wilderness, wild and scenic rivers, and national scenic and historic trails) and recommending additional areas for designation in forest plans might impact the reserved rights and interests of tribes."

This is a massive generalization that is least pertinent to wild and scenic rivers. A review of the cited reference for this statement (Stumpff 2000) found no reference to rivers, much less wild and scenic rivers. The statement also ignores the fact that wild and scenic river eligibility findings and suitability recommendations typically do not change current access. River classifications are based on the level of current development and access. Motorized access is allowed in eligible and designated scenic and recreational river segments, and in some case, wild segments.

In addition, the statement ignores that many eligible, suitable, and designated wild and scenic rivers actually protect from water resources and other inappropriate development cultural sites and properties of great importance to tribes. On rivers with outstandingly remarkable Native American cultural values, actions are mandated to protect and enhance those values at all times. Stumpff also notes that where protective designations may limit motorized access to cultural sites for tribal elders, special accommodations can and have been made (USDA Forest Service Proceedings RMRS-P-14, pg. 99, Stumpff 2000). Finally, nothing in the Wild and Scenic Rivers Act (or the Wilderness Act for that matter) would prohibit traditional cultural practices such as seasonal burning that can reduce fuel loads and maintain and enhance forest ecosystems.

In our discussions with various tribes about the Inyo, Sequoia, and Sierra Forest Plan Revisions, we have not heard any concern about designated, suitable, or eligible wild and scenic rivers impacting tribal rights, interests, or access.

IX. Recommended Wilderness

The opportunity to inventory and evaluate wilderness-quality lands is an integral component of the forest planning process and presents a rare opportunity to provide administrative protection to some of the most spectacular and ecologically important undeveloped lands on our national forests. These areas provide our drinking water, habitat for imperiled wildlife, physical, mental, and spiritual renewal for millions of Americans, and a buffer to the impacts of climate change. Thus, we are extremely disappointed to see only four additions to existing wilderness areas – all on the Inyo National Forest – being recommended for wilderness designation in the draft plans. While highly deserving of wilderness recommendation, those 37,039 acres represent only about 2.5% of the final 1.45-million-acre inventory of wilderness-quality lands on the Inyo, Sierra, and Sequoia National Forests. The Sierra and Sequoia draft plans would not recommend a single acre for wilderness designation, despite many deserving areas that, if recommended, would greatly enhance the forests' ecological health and integrity, opportunities for sustainable recreation, and protection of imperiled species, among other social and ecological benefits.

By contrast, Alternative C would recommend 743,076 acres across the three forests (about 51% of the final inventory), including many (but not all) of the most deserving areas. For the reasons described below, the Record of Decision for the final plans should adopt a strengthened Alternative C for recommended wilderness that includes important areas that were improperly excluded from Alternative C in the DEIS, including the Bright Star Wilderness addition, Rattlesnake/Durwood Creek watersheds in the Golden Trout addition (part of the Rincon Inventoried Roadless Area), Slate Mountain, Long Canyon, Oat Mountain, and Dennison Peak on the Sequoia, and Cat's Head Mountain and Soaproot on the Sierra. These and other areas in Alternative C that are especially deserving of recommended wilderness protection are described in detail in subsection E, below, and in Appendices A, B, and C.

A. Background and Regulatory Framework

The 2012 Planning Rule requires forests undergoing a plan revision to "[i]dentify and evaluate lands that may be suitable for inclusion in the National Wilderness Preservation System [NWPS] and determine whether to recommend any such lands for wilderness designation." 36 C.F.R. § 219.7(c)(2)(v). Chapter 70 of the Forest Service Land Management Planning Handbook (FSH) 1909.12 prescribes a four-step process for doing so: (1) inventory all lands that may be suitable for inclusion in the NWPS based on their size, roadless nature, and lack of improvements that are substantially noticeable in the area as a whole; (2) evaluate the wilderness characteristics of each inventoried area pursuant to the criteria in the Wilderness Act of 1964; (3) analyze a range of alternatives for recommended wilderness in the plan EIS; and (4) decide which areas or portions of areas to recommend for inclusion in the NWPS. Chapter 70 requires opportunities for public participation "early and during each step of the process." FSH 1909.12, ch. 70, § 70.61.

Given the myriad ecological and social benefits of wilderness and other highly protected lands (described in detail in subsection D, below), the wilderness recommendation process is a key component of satisfying the substantive requirements of the 2012 planning rule. The overarching purpose of the rule is to provide for the development of plans that:

> will guide management of [National Forest System] lands so that they are ecologically sustainable and contribute to social and economic sustainability; consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.

36 C.F.R. § 219.1(c). To accomplish these ecological integrity and sustainability goals, the rule imposes substantive mandates to establish plan components – including standards and guidelines – that maintain or restore healthy aquatic and terrestrial ecosystems, watersheds, and riparian areas; air, water, and soil quality; and the diversity of plant and animal communities, ecosystems, and habitat types. *Id.* §§ 219.8(a)(1)-(3), 219.9. Plans also must provide for sustainable recreation. *Id.* §§ 219.8(b)(2), 219.10(b)(1)(i). The Forest Service must use the best available scientific information to comply with these substantive mandates, *id.* § 219.3, and include in the decision document "[a]n explanation of how the plan components meet [those] requirements, *id.* § 219.14(a)(2).

For areas recommended for wilderness designations, plans must include plan components, including standards and guidelines, "to protect and maintain the ecological and social characteristics that provide the basis for their suitability for wilderness designation." 36 C.F.R. § 219.10(b)(1). "Any area recommended for wilderness or wilderness study designation is not available for any use or activity that may reduce the wilderness potential of an area." Forest Service Manual 1923.03(3).

We have provided numerous comment letters and input throughout the wilderness inventory and evaluation process on the Inyo, Sierra, and Sequoia. While the forests' inventory process was rigorous, comprehensive, transparent, and objective, the subsequent evaluation, determination of areas to carry forward into the DEIS alternatives, and NEPA analysis have been fraught with problems, as described below and in the attached letters that we have submitted previously.[44]

B. The wilderness evaluation and determination of areas to carry forward for analysis are flawed.

We are pleased to see that the Forest Service corrected some of its earlier errors in initially identifying only a small proportion of the final wilderness inventory to carry forward for analysis, and that the agency properly adjusted polygon boundaries where possible (as opposed

[44] The Wilderness Society, *et al.*, Comments on Ch. 70 wilderness evaluation process (Oct. 30, 2014) (identifying numerous deficiencies with the "Wilderness Evaluation Narrative Outline") (Exhibit IX.1); The Wilderness Society, *et al.*, Comments on Ch. 70 wilderness evaluation (June 3, 2015) (identifying process and range of alternatives deficiencies) (Exhibit IX.2); The Wilderness Society, *et al.*, Comments on Ch. 70 wilderness evaluation (Aug. 28, 2015) (identifying numerous deficiencies with the wilderness evaluation process paper) (Exhibit IX.3); The Wilderness Society, *et al.*, Comments on wilderness evaluation process (Dec. 1, 2015) (reiterating our process and range of alternatives concerns) (Exhibit IX.4); California Wilderness Coalition, Comments on early adopter forests wilderness evaluation process (Dec. 1, 2015) (providing site-specific comments on the evaluation of specific areas) (Exhibit IX.5); The Wilderness Society, *et al.*, Comments on wilderness evaluation process and areas identified for DEIS analysis (Feb. 1, 2016) (identifying deficiencies in application of wilderness evaluation criteria, identification of areas to carry forward for analysis, and range of alternatives) (Exhibit IX.6).

to excluding entire areas from analysis). *See* DEIS Appx. B at 228. Nevertheless, Appendix B to the DEIS reveals that the agency misapplied a number of the wilderness evaluation criteria in section 2(c) of the Wilderness Act and section 72 of the Chapter 70 directives to inappropriately exclude areas or portions of areas from analysis in the DEIS.

The proper evaluation criteria are: (1) apparent naturalness, or the degree to which the area generally appears to be affected primarily by the forces of nature, with the imprints of man's work substantially unnoticeable; (2) outstanding opportunities for solitude *or* for a primitive and unconfined type of recreation in at least some portion of the unit; (3) whether an area less than 5,000 acres is of sufficient size to make practicable its preservation and use in an unimpaired condition; and (4) the degree to which the area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value. 16 U.S.C. § 1131(c); FSH 1909.12, ch. 70, § 72.1. The Chapter 70 directives add a fifth evaluation criterion that is not grounded in the Wilderness Act: the degree to which the area may be managed to preserve its wilderness characteristics, based on the geographic shape and configuration of the area and any governing legal requirements. FSH 1909.12, ch. 70, § 72.1(5). Because the determination of areas to carry forward for analysis must be "[b]ased on the evaluation and input from public participation opportunities," FSH 1909.12, ch. 70, § 73, it is critical that the evaluation criteria are properly applied.

1. Apparent naturalness versus ecological integrity

The Forest Service appears to have corrected many of the draft evaluation narratives that improperly evaluated the naturalness criterion by focusing in large part on the area's ecological or historical naturalness or integrity, rather than its *apparent* naturalness, as required under the Wilderness Act and Chapter 70 directives. The evaluation of naturalness must focus on whether the area generally *appears* natural to the average, reasonable visitor who is unfamiliar with the area's historical or ecological conditions. Chapter 70 makes clear that the agency is to evaluate "[t]he extent to which the area *appears* to reflect ecological conditions that would normally be associated with the area without human intervention" and whether "plant and animal communities *appear* substantially unnatural." FSH 1909.12, ch. 70, § 72.1(1)(a) & (b) (emphasis added).

While we appreciate the effort to correct this deficiency in the draft evaluation narratives, many of those corrections appear to be largely superficial or semantic. For instance, the draft narrative for Watterson Canyon (Polygon 944) on the Inyo National Forest noted that "[t]here is a departure from natural conditions due to the presence of invasive plant species (cheatgrass is expanding)." The final narrative for Watterson Canyon states that "[t]here is a departure from apparent naturalness due to the presence and expansion of cheatgrass, an invasive plant species." DEIS Appx. B at 28. Despite the shift in terminology from natural conditions to apparent naturalness, there is still no indication of how the presence of that species affects how the area would be perceived by the average visitor. *See also, e.g., id.* at 74 (narrative for Lundy Canyon (Polygon 1211) on the Inyo describes increasing presence of cheatgrass, with no evaluation of how the invasive affects the area's appearance). Absent an evaluation of whether and why those plant communities *appear* substantially unnatural, the presence and expansion of cheatgrass – which is ubiquitous in many areas – is irrelevant. And while the Forest Service appears to have

diligently scrubbed the final evaluation narratives of the term "ecological integrity," the same problematic categorization of an area's relative ecological integrity – without regard to how ecological conditions *appear* to the average visitor – remains in a significant number of the descriptions of the areas analyzed as recommended wilderness in the DEIS.[45]

Despite these errors in applying the *apparent* naturalness criterion, improper evaluation of ecological or historical naturalness or integrity does not appear to have been a factor in excluding areas or portions of areas from analysis in the DEIS. *See* DEIS Appx. B at 359-76. To the extent it was a factor, however, the Forest Service must make that clear to the public.

2. Consideration of human activities and improvements

Many of the final evaluation narratives still improperly rely on the presence of past or current human activities or improvements – such as mining, grazing, fish stocking, restoration activities, timber harvest, recreation developments, historic sites, or wildlife improvements – when evaluating naturalness. The relevant inquiry, however, is not the presence of these activities or improvements, but rather their effect on the area's naturalness, as judged by the average visitor. FSH 1909.12, ch. 70, § 72.1(1)(c) ("Consider such factors as . . . [t]he extent to which improvements included in the area . . . represent a departure from apparent naturalness."). Areas need not be pristine or untouched to be suitable for wilderness designation, and an area may include any number of past or present activities or improvements – as long as they are substantially unnoticeable.[46]

Yet statements about the mere presence of grazing or restoration activities, among other examples, still pervade many of the narratives without an evaluation of how those activities or improvements affect the areas' naturalness. Numerous narratives mention the presence of historic and current grazing. For instance, the narrative for Soaproot (Polygon 357) on the Sierra mentions an active allotment and that a corral, fencing, and salt blocks are present, but does not evaluate the effect of that activity and infrastructure on the area's apparent naturalness. DEIS Appx. B at 193. It is unclear whether grazing impacted the determination to exclude Soaproot from the DEIS. *See* DEIS Appx. B at 373. Grazing and associated infrastructure is commonplace throughout many designated and recommended wilderness areas in western national forests.[47]

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[45] *E.g.*, DEIS Appx. B at 246 (Glass Mountains on the Inyo "has moderate ecological integrity"), 251 (Huntoon Creek on the Inyo "has high ecological integrity"), 255 (Marble Canyon on the Inyo "has ecological integrity with mostly natural species composition"), 257 (Marble Creek on the Inyo "has moderate to high ecological integrity with some invasive plant species), 300 (Golden Trout Wilderness Additions (3) on the Sequoia "has moderate ecological integrity"), 311 (in Monarch Wilderness Addition-South on the Sequoia, "[e]cological integrity is largely intact, and there has been little effect to natural plant, wildlife, watershed and soil conditions"), 317 (South Sierra Wilderness Additions-West(1) on the Sequoia "has moderate ecological integrity and moderately reflects conditions that would normally be associated with an area absent of human intervention"), 344 (Ferguson Ridge on the Sierra "has ecological integrity [and] species composition is based on natural process").

[46] *See* Wilderness Evaluation Process Paper, Attachment B: Guidance for Consideration of Evaluated Areas for Recommendation in an Alternative, at 1 (listing numerous types of activities and improvements that may be included in recommended wilderness areas).

[47] Congressional grazing guidelines provide that: (1) "[t]he maintenance of supporting facilities, existing in the area prior to its classification as wilderness (including fences, line cabins, water wells and lines, stock tanks, etc.), is permissible in wilderness," and (2) "[t]he placement or reconstruction of deteriorated facilities or improvements should not be required to be accomplished using 'natural materials.'" Forest Service Manual 2323.22 - Exhibit 01.

Other narratives mention past and ongoing restoration activities, without any explanation of how or why those activities – which are generally designed to restore forest resources and ecosystems to a more natural state – might detract from apparent naturalness. For instance, the narrative for the Glass Mountains (Polygon 1012) on the Inyo mentions sage grouse restoration habitat, watershed restoration activities, and aspen restoration but does not evaluate how those activities impact the area's naturalness, as perceived by the average visitor. DEIS Appx. B at 31. It is unclear whether the presence of those activities contributed to the exclusion of approximately 6,000 acres of the area from NEPA analysis. *See* DEIS Appx. B at 359.

3. Opportunities for solitude *or* primitive and unconfined recreation

The Forest Service appears to have improperly conflated the criterion that an area has *either* outstanding opportunities for solitude *or* primitive and unconfined recreation. Both the plain language of the Wilderness Act, 16 U.S.C. § 1131(c)(2), and the Chapter 70 directives make clear that this is an either/or criterion: "an area only has to possess one of the other" and "does not have to possess outstanding opportunities for both elements, nor does it need to possess outstanding opportunities on every acre." FSH 1909.12, ch. 70, § 72.1(2). Thus, the evaluation must consider them separately and cannot aggregate, average, or otherwise conflate the two.

Unfortunately, the Forest Service continues to conflate the two. Nearly every last rationale for areas not analyzed as recommended wilderness states that "opportunities for solitude or primitive and unconfined recreation are limited" (typically due to the presence of motorized uses within or adjacent to the polygon, as addressed in detail in subsections 4-6, below). *See* DEIS Appx. B at 359-76. This language – which serves as the primary rationale for excluding most of the areas not carried forward for analysis – suggests that opportunities for one or the other (but not both) are limited, meaning that the area should not be disqualified. Instead, opportunities for both solitude *and* primitive and unconfined recreation would have to be limited throughout the unit to disqualify it. To the extent the Forest Service meant to express the latter, its evaluation does not support such a finding. For instance, the sort of pervasive outside sights and sounds that might limit opportunities for solitude (see subsection 4, below), do not impact whether portions of the unit have outstanding opportunities for primitive and unconfined types of recreation.

For example, over 58,000 acres of potential additions to the Golden Trout Wilderness identified as Polygon 1387 (including portions of the Rincon Inventoried Roadless Area) were not analyzed in Alternative C because:

> Opportunities for solitude or primitive and unconfined recreation are limited due to an extensive network of authorized motorized trails in some areas, and an extensive network of authorized forest system roads that are open to the public in other areas. Sights and sounds would likely penetrate through these subpolygon areas.

DEIS Appx. B at 370. Both this explanation and the evaluation narrative for this polygon improperly lump opportunities for solitude with opportunities for primitive and unconfined recreation, and neither explains how or why the presence and use of motorized trails and roads identified as unneeded in certain portions of the polygon limit *both* opportunities for solitude *and*

opportunities for primitive and unconfined recreation throughout the entire polygon. Indeed, the narrative suggests that outstanding opportunities for both exist in portions of the polygon. Nor did the Forest Service attempt to adjust the polygon boundary to exclude the motorized trails and unneeded roads it believes are disqualifying and instead failed to carry forward a nearly 60,000 acres – the majority of which are entirely free of motorized uses. Indeed, the recommendations submitted by The Wilderness Society and California Wilderness Coalition in November 2014 identified nearly 40,000 acres of highly deserving, wilderness-caliber lands within this polygon, most of which are contiguous to the existing Golden Trout Wilderness and completely free from motorized uses, roads, and trails.[48]

Another example of an area improperly excluded due to comingling opportunities for solitude and opportunities for primitive and unconfined recreation is Mono Craters on the Inyo (Polygon 1072). The rationale for excluding the area from analysis states:

> Opportunities for solitude or primitive and unconfined recreation are limited throughout much of this polygon due to an extensive network of authorized forest system roads, including a few authorized forest system roads that cherry stem to partially divide the polygon into smaller sections. There are limited opportunities for solitude or primitive and unconfined recreation along the southern boundary due to the proximity to a commercial pumice mine. Sights and sounds from roadways and the pumice mine penetrate into those areas of the polygon.

DEIS Appx. B at 360. Regardless of how nearby roads or the pumice mine might impact opportunities for solitude in portions of the polygon, Mono Craters undoubtedly includes outstanding opportunities for primitive and unconfined recreation, including high-quality backcountry skiing and hiking destinations and uses. The narrative for the polygon fails to properly acknowledge those known and outstanding recreational opportunities. *See id.* at 37 (stating that "[t]here *may be* opportunities for primitive and unconfined recreation, including cross-country hiking, photography and general forest exploration" (emphasis added)).

4. Outside sights and sounds

The Forest Service appears to have disqualified numerous areas due to the improper consideration of outside sights and sounds – often related to motorized activity on roads or trails outside the polygon. Outside sights and sounds are relevant to the evaluation of opportunities for solitude only to the extent that they are "pervasive and influence a visitor's opportunity for solitude" throughout the unit. FSH 1909.12, ch. 70, § 72.1(2)(a).[49] While many of the narratives refer to "pervasive" motorized use (inside and/or outside the unit), the narratives generally lack an evaluation of whether the sights and sounds originating from that use are themselves pervasive and how they influence a visitor's opportunity for solitude throughout the unit. Instead, many of the narratives make the unsupported conclusion that sights and sounds "would likely

[48] *See* The Wilderness Society & California Wilderness Coalition, Recommendations for management of roadless areas in the Sequoia National Forest, at 12-14 (Nov. 17, 2014) (Exhibit IX.7).

[49] *See also* Bureau of Land Management Manual (BLM) 6310.06(C)(2)(c)(i)(1) ("Only consider the impacts of sights and sounds from outside the inventory area on the opportunity for solitude if these impacts are pervasive and omnipresent.").

penetrate throughout much of the polygon." None of the assertions are supported by empirical data, models of noise attenuation, or surveys from within the roadless polygons. The rationales for areas not carried forward for analysis repeat these same errors.

Of particular concern is the fact that many narratives and rationales rely on sights or sounds associated with motorized use of the roads that necessarily define the boundaries of the polygon, or are cherry-stemmed, to disqualify all or portions of the unit. Many designated wilderness areas, however, are closely bordered by high-traffic roads. For example, California State Route 120 bisects the Yosemite Wilderness in Yosemite National Park. This two-lane, paved expressway with a 50 m.p.h. speed limit and an average annual daily traffic count of 2,450 vehicles at Tioga Pass is buffered from the Yosemite Wilderness by less than 0.05 miles. California State Route 108, another two-lane, paved expressway, runs along the Emigrant Wilderness in the Stanislaus National Forest with an average annual daily traffic count of 630 vehicles at the Tuolumne/Mono County line, yet is only 0.25 miles from the wilderness boundary.[50] This situation is ubiquitous throughout designated wilderness in California and around the country.[51] If Congress saw fit to use these highways and other major thoroughfares as wilderness boundaries, we do not see how, in the absence of real data, the Forest Service can justify the claim that the noise caused by lesser roads or even motorized trails can create a "pervasive" loss of wilderness values across large, rugged, and usually trackless landscapes.

Disqualifying an area based on outside sights and sounds is also contrary to longstanding direction from Congress. For instance, during subcommittee hearings on the 1978 Endangered American Wilderness Act, Congress found that:

> [M]any areas, including the Lone Peak [outside Salt Lake City] . . . , received lower wilderness quality ratings because the Forest Service implemented a "sights and sounds" doctrine which subtracted points in areas where the sights and sounds of nearby cities (often many miles away) could be perceived from anywhere within the area. This eliminated many areas near population centers and has denied a potential nearby high quality wilderness experience to many metropolitan residents, and is inconsistent with Congress' goal of creating parks and locating wilderness areas in close proximity to population centers. The

[50] *2014 Traffic Volumes on the California State Highway System.* State of California, California State Transportation Agency, Department of Transportation, Division of Traffic Operations, Sacramento, CA 95814. Prepared in Cooperation with the U.S. Department of Transportation, Federal Highway Administration.

[51] Other examples from the Sierra Nevada include the Ansel Adams Wilderness (bordered by Kaiser Pass Road and Edison Lake Road), Hoover Wilderness (bordered by Highway 120), Mokelumne Wilderness (bordered by Highway 4 and Blue Lakes Road), Carson-Iceberg Wilderness (bordered by Highway 4 and Highland Lakes Road), John Muir Wilderness (bordered by Rock Creek Road, Pine Creek Road, Horton Creek Road, Bishop Bowl Road, Highway 168, Onion Valley Road, Horseshoe Meadows Road and Florence Lake Road), John Krebs Wilderness (bordered by Mineral King Road), Sequoia-Kings Canyon Wilderness (bordered by the Generals Highway), Yosemite Wilderness (in addition to Highway 120, mentioned above, it is also bordered by Evergreen Road, Tioga Road, Oak Flat Road, Glacier Point Road, Wawona Road and Mariposa Grove Road), Kaiser Wilderness (adjoins Kaiser Loop Road and Kaiser Pass Road), Monarch Wilderness (bordered by Highway 180), Sacatar Trail Wilderness (adjacent to Nine Mile Canyon Road), Owens Peak Wilderness (bordered by Kennedy Meadows Road, Sherman Pass Road and Highway 178), Kiavah Wilderness (bordered by Highway 178 and South Kelso Valley Road) and the Domeland Wilderness (bordered by Kennedy Meadows Road).

> committee is therefore in emphatic support of the Administration's decision to immediately discontinue this "sights and sounds" doctrine.

H.R. Rep. No. 95-540, at 5 (1977). During Senate hearings on the same Act, then Assistant Secretary of Agriculture assured Congress that "there is no reference in the Wilderness Act to criteria for wilderness that includes such things as the sights, sounds, and smells of civilization which is a set of criteria which has been misapplied to wilderness areas." Hearings on S. 1180 before the Subcomm. on Parks and Recreation of the S. Comm. on Energy and Nat. Res., 95th Cong. at 41 (1977) (Statement of M. Rupert Culter, Assistant Sec., U.S. Dep't of Agric.).

Thus, the Forest Service bears a high burden to show that outside sights or sounds are in fact pervasive and limit a visitor's opportunity to experience solitude throughout the unit. And even where the agency can meet that high burden, it must also show that the area *also* fails to possess outstanding opportunities for primitive and unconfined recreation prior to disqualifying the unit. The information in Appendix B to the DEIS does not demonstrate that the Forest Service has satisfied that burden. Unfortunately, improper consideration of sights and sounds is the most frequently cited rationale by the Forest Service for not analyzing some of our highest-priority areas for recommended wilderness in Alternative C, including the Golden Trout additions (Polygon 1387), Oat Mountain (Polygon 227), Bright Star additions (Polygon 1426), Soaproot (Polygon 357), and Cat's Head (Polygon 304).

5. Consideration of motorized uses

The Forest Service's treatment of authorized motorized uses throughout the evaluation and determination of areas to carry forward for analysis has been deeply flawed, as we have repeatedly pointed out. According to the DEIS, "the portions of [] polygons that include authorized motorized trails based on recent travel management decisions were excluded" from analysis. DEIS Appx. B at 231.[52] The primary rationales for this blanket exclusion of areas with motorized trails appears to be that the presence of the motorized uses within the unit limit "opportunities for solitude or primitive and unconfined recreation" and/or would frustrate management of the unit as recommended wilderness. Both of these rationales are faulty.

First, the presence of authorized motorized activity in an area does not necessarily impede its wilderness character. Indeed, Congress, the Forest Service, and other agencies have routinely determined that areas with authorized motorized activity possess wilderness characteristics and managed them to maintain their suitability for inclusion in the NWPS.[53]

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[52] This approach mirrors the Forest Service's initial attempt in late 2014 to exclude from detailed evaluation approximately 19% of the inventoried acreage that contain motorized uses on authorized trails. Our previous comment letters explained in detail why that approach was flawed. *See, e.g.*, Exhibit IX.1 at 3-6 (Oct. 30, 2014 comments); Exhibit IX.3 at 6-7 (Aug. 28, 2015 comments).

[53] *See, e.g.*, Public Law No. 96-550, § 103, 94 Stat. 3221 (Dec. 19, 1980) (designating six wilderness study areas in New Mexico National Forests to be managed "to maintain their presently existing wilderness character and potential for inclusion in the [NWPS]: *Provided*, [t]hat . . . current levels of motorized . . . uses . . . shall be permitted to continue subject to . . . reasonable rules and regulations"); Payette National Forest, Land and Resource Management Plan, ROD-9, III-74, III-82 (2003), *available at* http://www.fs.usda.gov/detail/payette/landmanagement/planning/?cid=stelprdb5035589 (recommending over 200,000 acres for wilderness designation and permitting existing motorized uses to continue in those areas unless it

Second, as described in subsections 3 and 4, above, the Forest Service has not demonstrated how or why the presence of motorized uses degrades *both* opportunities for solitude *and* primitive and unconfined types of recreation throughout the entire unit. In many instances, the Forest Service appears to have disqualified areas or large portions of areas due to the presence of only a handful of motorized trails and without making the requisite showing of how that use would affect a visitor's ability to experience solitude elsewhere, taking into account factors such as topography, presence of screening, and distance from impacts. *See* FSH 1909.12, ch. 70, § 72.1(2)(a). Importantly, as with outside sights or sounds, impacts originating within the unit must be "pervasive and influence a visitor's opportunity for solitude" throughout the area. *Id.* Moreover, authorized motorized uses within a unit are irrelevant to whether there are opportunities to engage in primitive and unconfined recreational activities "that lead to a visitor's ability to feel a part of nature." *See id.* § 72.1(2)(b).

Third, as described in detail in subsection 6, below, the presence of motorized uses is not a proper manageability consideration at the evaluation stage. Instead, consideration of how to balance motorized recreational opportunities with protection of wilderness values is a management trade-off that should be analyzed in the DEIS.

Finally, we are deeply concerned that portions of polygons containing system roads identified as "likely not needed" in the Sequoia's Travel Analysis Process that are currently open to public use were, as a blanket matter, not carried forward. DEIS Appx. B at 232. This appears to have affected a large number of areas and significant acreage.[54] This approach is contrary to the language and intent of Forest Service laws, policies, and objectives aimed at restoring roaded areas to a more ecologically and fiscally sustainable condition. The travel analysis process under subpart A of the Forest Service travel management regulations is a key component of the agency's restoration agenda.

Recognizing the significant ecological and fiscal liabilities associated with the current, unsustainable forest road system, subpart A directs the Forest Service to identify the "minimum road system needed for safe and efficient travel and for administration, utilization and protection of National Forest System lands," as well as roads "that are no longer needed to meet forest resource management objectives and that, therefore, should be decommissioned or considered for other uses, such as for trails." 36 C.F.R. § 212.5(b). As a first step in achieving compliance with this regulation, forests were required by the end of fiscal year 2015 to conduct a science-based analysis (referred to as a travel analysis report) of their road system that includes recommendations for roads likely not needed for future use. March 29, 2012 Memorandum from Leslie Weldon to Regional Foresters *et al.* Re Implementation of 36 CFR 212.5(b). As the Forest

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degrades wilderness values or causes resource damage or user conflicts); BLM Manual 6320.06(A)(2)(d)(v) (BLM-identified Lands with Wilderness Characteristics may include motorized uses on designated routes); BLM, Little Snake Field Office, Record of Decision and Approved Resources Management Plan at 33 (Oct. 2011), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/little_snake_field/rmp_revision/rod.Par.83246.File.dat/01_LS-ROD_Approved-RMP.pdf (motorized activity permitted on designated roads and trails within Lands with Wilderness Characteristics).

[54] *See* DEIS Appx. B at 368-72 (Polygons 160, 162, 227, 1377, 1378, 1384, 1385, 1387, 1390, 1391, 1394, 1404, 1408, and 1431, or portions thereof, appear to have been excluded in part due to this rationale. The excluded areas total as much as 163,477 acres.).

Service properly recognized when promulgating the Chapter 70 directives, roads identified in a travel analysis report as likely unneeded do not disqualify an area from the wilderness inventory and evaluation. FSH 1909.12, ch. 70, § 71.22a(1)(b). This provision is specifically aimed at ML2 or greater roads (since areas with ML1 roads are already included in the inventory under section 71.22a(1)(a)) that might otherwise be disqualifying, but will likely be decommissioned or converted in the future, thereby restoring the affected area to a roadless condition. While the Sequoia National Forest properly applied this criterion when conducting its inventory, the blanket determination not to analyze areas including such roads in the DEIS undermines the whole intention behind linking the travel analysis process to the Chapter 70 process – as well as the Forest Service's broader restoration agenda.

While we appreciate that the relevant roads are currently open to public use on the forest's Motor Vehicle Use Map, that in no way precludes consideration of those areas as recommended wilderness. Travel management decisions must be periodically revisited to meet changing conditions and ensure consistency with the governing land management plan. 36 C.F.R. §§ 212.54, 212.57, 219.15. And the forest plan revision is the appropriate place to take a high-level look at restoration needs and objectives related to roads. *See* Section XII, below, addressing roads and infrastructure in detail. More specifically, the DEIS is the appropriate place to weigh the tradeoffs associated with permitting ongoing public use of roads identified through a rigorous, scientific analysis as likely unneeded because they pose a high risk and/or have low benefit, versus restoring the affected area to a more ecologically and fiscally sustainable condition and managing it to protect its wilderness characteristics. Should the agency decide to pursue a restoration and wilderness protection strategy in some of the affected areas, it can then revisit any preexisting travel management decisions to ensure consistency with forest plan direction. *See* 36 C.F.R. § 219.15(e) ("[Travel management] plans developed prior to plan decision must be evaluated for consistency with the plan and amended if necessary."). But by failing to carry forward any of these areas into the DEIS, the Forest Service has prematurely precluded that important opportunity.

While areas including legally open roads identified as unneeded in a travel analysis process and/or authorized motorized trails should be carried forward for NEPA analysis, another important strategy that the agency must consider is readjusting polygon boundaries to cherry-stem or otherwise exclude roads or trails. Unfortunately, there are many instances where the Forest Service failed to apply that strategy and instead excluded entire polygons or large portions of ecologically-important polygons from the analysis. For instance, the rationale for excluding Oat Mountain (Polygon 227) on the Sequoia relies heavily on the presence of an inholding and associated access road. DEIS Appx. B at 368. However, as early as 2014, The Wilderness Society and California Wilderness Coalition pointed out that the inholding and access road can become the western boundary of the area, leaving 10,992 acres of high-quality wilderness lands that include ecologically-important and under-represented oak woodland habitat. *See id.* at 142 (describing 8 under-represented ecological groups covering nearly 12,000 acres of the polygon). The Soaproot (Polygon 357) and Cat's Head (Polygon 304) areas on the Sierra were also improperly excluded from NEPA analysis based largely on motorized uses and likewise include under-represented, low-elevation ecosystem types that are rapidly being lost to development, agriculture, and other activities on private land. *See id.* at 188, 192, 373. In our view, it is critical

that these iconic Sierra foothill ecosystems be represented in the NWPS and must be analyzed as recommended wilderness in one or more alternative.

6. Manageability considerations

The Forest Service also improperly evaluated manageability and excluded areas or portions of areas from analysis due to premature and unsupported conclusions that "existing management activities and potential future management needs conflicted with preserving the area's wilderness characteristics." *See, e.g.*, DEIS Appx. B at 228. Manageability considerations "included, but w[ere] not limited to, fuels and vegetation management activities needed to protect adjacent high value areas and communities, management of existing special use permits and facilities, and the ability to define polygon boundaries and keep incompatible uses out." *Id.* While factors such as the geographical shape and configuration of the area and any governing legal requirements are appropriate manageability considerations at the evaluation stage, *see* FSH 1909.12, ch. 70, § 72.1(5),[55] existing management activities and potential future management needs are not. Instead, management *trade-offs* – such as whether a unit may be managed to use or control fire, to conduct ecological restoration activities, or to permit discretionary special uses such as motorized recreation – are appropriately considered in the DEIS alternatives analysis.

A number of the narratives and associated rationales for areas not carried forward focus on ongoing or potential future fuels or restoration treatments. Consideration of these sorts of management tradeoffs are outside the scope of the wilderness evaluation. Even if they were proper considerations, the narratives and rationales fail to show how those activities would necessarily interfere with preservation of wilderness characteristics. As a general matter, the Wilderness Act tasks agencies with managing wilderness for a range of public purposes, including recreational, scenic, scientific, educational, conservation, and historical uses, 16 U.S.C. § 1133(b), and a number of management activities such as ecological restoration and wildfire management may continue if they do not interfere with preservation of wilderness characteristics.[56] The proper way of addressing wildfire management and restoration needs in areas that may be suitable for inclusion in the NWPS is to analyze in the DEIS the management tradeoffs associated with more active management under a non-recommended wilderness prescription, versus less intensive treatments under a recommended wilderness prescription. Yet by not carrying these areas forward for analysis, the Forest Service has again precluded that analysis.

Many of the narratives also continue to improperly rely on the presence of motorized uses as impediments to wilderness management. Consideration of how to balance motorized recreational opportunities with protection of wilderness characteristics is another management trade-off that should be analyzed in the DEIS and is not an appropriate consideration at the evaluation stage or

[55] Factors to consider when evaluating "the degree to which the area may be managed to preserve its wilderness characteristics [include]: (a) Shape and configuration of the area; (b) Legally established rights or uses within the area; (c) Specific Federal or State laws that may be relevant to the availability of the area for wilderness or the ability to manage the area to protect wilderness characteristics; (d) The presence and amount of non-Federal land in the area; and (e) Management of adjacent lands." FSH 1909.12, ch. 70, § 72.1(5).

[56] *See, e.g.*, Wilderness Evaluation Process Paper, Attachment B: Guidance for Consideration of Evaluated Areas for Recommendation in an Alternative, at 1 ("Congress has recognized the need to provide for passive or active restoration in previously modified areas that have wilderness characteristics.").

in determining areas to carry forward for NEPA analysis. Importantly, authorized motorized uses are not "[l]egally established . . . uses" that are among the appropriate factors to consider in the evaluation of manageability. *See* FSH 1909.12, ch. 70, § 72.1(5)(b). Legally established uses are those established by law, such as mining on patented or unpatented hardrock mining claims, permitted ski area operations, or American Indian uses guaranteed by treaty.[57] Agency planning or implementation decisions that *authorize* certain uses – such as designation of motorized trails in a travel management plan – are not legally established uses.

Recommendations: The Forest Service must correct the errors in its application of the wilderness evaluation criteria. This will require additional revisions to the evaluation narratives and the rationales for areas not carried forward for analysis. To the extent the rationales rely on improper criteria, the excluded areas must be reconsidered for inclusion in one or more alternatives, which will require a revised or supplemental DEIS. Criteria that are routinely misapplied in the narratives *and* rationales include:

- Conflating opportunities for solitude or primitive and unconfined recreation;
- Improper reliance on outside sights or sounds, often associated with motorized use on boundary roads;
- Excluding areas with authorized motorized trails;
- Excluding areas with roads identified as "likely unneeded;" and
- Improper consideration of management tradeoffs – such as ongoing and potential future restoration or fire management activities and motorized uses – to exclude areas.

C. The DEIS fails to analyze a reasonable range of alternatives.

The analysis of alternatives under NEPA is the "heart" of an EIS. 40 C.F.R. § 1502.14. An agency must "[r]igorously explore and objectively evaluate all reasonable alternatives" to a proposed action. *Id.* § 1502.14(a); *see also* 42 U.S.C. § 4332(2)(E) (agencies must "study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources"). Consistent with NEPA's basic policy objective to protect the environment, this includes more environmentally protective alternatives. 40 C.F.R. § 1500.2(e) (agencies must "[u]se the NEPA process to identify and assess reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment"); *see also, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1121-22 (9th Cir. 2002) (citing cases), *abrogated on other grounds by The Wilderness Soc'y v. U.S. Forest Serv.*, 630 F.3d 1173, 1178-80 (9th Cir. 2011) (en banc). "The existence of a viable but unexamined alternative renders an [EIS] inadequate." *Mont. Wilderness Ass'n v. Connell*, 725 F.3d 988, 1004 (9th Cir. 2013) (quotations and citation omitted). The "touchstone" of the inquiry is "whether an EIS's selection and discussion of alternatives fosters informed decision-making and informed public participation." *Id.* at 1005 (quotations and citation omitted).

[57] *See* General Mining Law of 1872, 30 U.S.C. §§ 22, 26; National Forest Ski Area Permit Act of 1986, 16 U.S.C. § 497b; *Minnesota v. Mille Lacs Band of Chippewa Indians*, 526 U.S. 172, 177, 193-95, 202 (1999) (affirming tribal hunting, fishing, and gathering rights established by treaty).

While the inclusion of 743,076 acres as recommended wilderness in Alternative C represents a significant improvement over the earlier proposals to carry forward for analysis only very small amounts of qualifying lands, the range of alternatives still does not satisfy NEPA because: (1) the upper end of the range (between 52 and 100% of the final inventory) and intermediate alternatives are still missing, and (2) Alternative C fails to include qualifying areas on the Sierra and Sequoia National Forests that the public recommended at scoping.

1. The upper end of the range and intermediate alternatives are missing.

Alternatives that range from 0 to 743,076 acres (out of 1.45 million potential acres) of recommended wilderness, with one intermediate alternative of 37,039 acres, do not constitute a true range that satisfies NEPA: the top 52% of the range is missing, as well as the portion of the range between 2.5 and 51%. *Compare California v. Block*, 690 F.2d 753, 765, 768-69 (9th Cir. 1982) (despite considering an alternative that allocated 100% of inventoried roadless areas to wilderness, "it was unreasonable for the Forest Service to overlook the obvious alternative of allocating more than a third of the RARE II acreage to a Wilderness designation"), *with Mont. Wilderness Ass'n*, 725 F.3d at 1004-05 (range of alternatives that included opening between 0 and 10 of 10 existing airstrips, with three intermediate options, was reasonable). Similar to the situation in *California v. Block* – where the Ninth Circuit invalidated an EIS that "uncritically assume[d] that a substantial portion of the [roadless] areas should be developed and consider[ed] only those alternatives with that end result," 690 F.2d at 767 – the DEIS assumes that nearly half the inventoried areas should not be protected as recommended wilderness and considers only those alternatives with that end result.

By adding an alternative that includes all, or the vast majority of, the 1.45-million-acre inventory, the Forest Service would ensure an adequate range of alternatives and a robust analysis of the trade-offs and impacts associated with recommending most (if not all) of the inventoried areas. *See, e.g.*, Council on Environmental Quality, *NEPA's Forty Most Asked Questions*, 46 Fed. Reg. 18,026 (Mar. 23, 1981) ("When there are potentially a very large number of alternatives, only a reasonable number of examples, covering the full spectrum of alternatives, must be analyzed and compared in the EIS. An appropriate series of alternatives might include dedicating 0, 10, 30, 50, 70, 90, or 100 percent of the Forest to wilderness."). This is comparable to the range of alternatives in the Flathead National Forest DEIS, which recommend for wilderness designation 0, 15, 29, and 78% of the final 644,847-acre inventory. Adding an alternative that includes all or most of the inventoried areas would also ensure that the current Alternative C provides an appropriate intermediate alternative.

2. The DEIS fails to analyze qualifying areas that the public recommended at scoping.

While Alternative C includes many ecologically significant areas with outstanding wilderness characteristics, several equally deserving areas or portions of areas that we recommended at scoping were improperly excluded on the Sierra and Sequoia National Forests. The Wilderness Society and California Wilderness Coalition specifically recommended 233,111 acres on the Sierra National Forest and 248,526 acres on the Sequoia National Forest for wilderness

designation.[58] Our recommendations provided detailed information about the wilderness characteristics of the areas, and asked that they be included in the preferred alternative. Under NEPA, the Forest Service is obligated to consider and analyze this reasonable proposal in at least one alternative. *See Mont. Wilderness Ass'n*, 725 F.3d at 1004 ("The existence of a viable but unexamined alternative renders an [EIS] inadequate." (quotations and citation omitted)).

Of the 481,637 acres The Wilderness Society and California Wilderness Coalition recommended on the Sierra and Sequoia, the Forest Service excluded 182,094 acres (approximately 38% of the recommended acreage) from the NEPA analysis entirely. *See* Map A, attached (depicting citizen recommended wilderness excluded from Alternative C). These areas include the Bright Star Wilderness addition, Rattlesnake/Durwood Creek watersheds in the Golden Trout addition, Slate Mountain, Long Canyon, Oat Mountain, and Dennison Peak on the Sequoia, and Cat's Head Mountain and Soaproot on the Sierra, each of which are described in detail in Appendix A.

The DEIS explanation for not analyzing an alternative that includes "all areas identified by the public as recommendations for additions to the National Wilderness Preservation System," DEIS at 41-42, is faulty. The DEIS claims that areas were not carried forward because they did not satisfy one or more of the evaluation criteria and that, "[i]n particular, areas with motor vehicle designations from recent travel management decisions were considered but then excluded from polygon boundaries carried forward for analysis." DEIS at 41 (referencing Appendix B for further information). However, as described in subsection B, above, the Forest Service misapplied the evaluation criteria to exclude qualifying areas from DEIS analysis – including the omitted areas mentioned above. The blanket exclusion of areas with motorized trails is particularly faulty. The presence of authorized motorized activity in an area does not necessarily impede its wilderness character, as described above. And to the extent the Forest Service treated motorized uses as a manageability concern, that is not a proper consideration at the evaluation stage or in determining areas to carry forward for analysis. Instead, whether to manage an area to protect its wilderness characteristics or to promote and facilitate motorized recreation are precisely the sort of management tradeoffs that should be analyzed in the plan EIS.

Recommendations: The Forest Service should analyze an alternative that includes all, or the vast majority of, the 1.45-million-acre inventory. This will necessitate a revised or supplemental DEIS. In addition, the Forest Service should include in Alternative C all the areas that The Wilderness Society and California Wilderness Coalition, and other members of the public, recommended for wilderness designation during scoping and other relevant public participation opportunities. This will require a revised or supplemental DEIS. *See* 40 C.F.R. § 1502.9(a) & (c).

D. The DEIS and draft plans fail to analyze or account for the ecological benefits of recommended wilderness.

Undeveloped natural lands provide numerous ecological benefits. They safeguard biodiversity, enhance ecosystem representation in protected areas (Dietz *et al.* 2015), facilitate connectivity

[58] The Wilderness Society & California Wilderness Coalition, Recommendations for management of roadless areas in the Sequoia National Forest (Nov. 17, 2014) (Exhibit IX.7); The Wilderness Society & California Wilderness Coalition, Recommendations for management of roadless areas in the Sierra National Forest (Nov. 17, 2014) (Exhibit IX.8).

(Loucks *et al.* 2003; USDA forest service 2001b; Crist *et al.* 2005; Wilcove 1990; The Wilderness Society 2004; Strittholt and DellaSala 2001; DeVelice and Martin 2001; Belote *et al.* 2016), and provide high-quality or undisturbed water, soil, and air resources (Anderson *et al.* 2012; DellaSala *et al.* 2011). They also serve as ecological baselines to facilitate better understanding of our impacts to other landscapes and as reference areas for ecological restoration (Arcese and Sinclair 1997).

Forest Service roadless lands, in particular, are heralded for their conservation values. Those values are described at length in the preamble of the Roadless Area Conservation Rule (RACR), 66 Fed. Reg. 3244, 3245-47 (Jan. 12, 2001), and in the Final Environmental Impact Statement (FEIS) for the RACR.[59] They include: high-quality or undisturbed soil, water, and air; sources of public drinking water; diverse plant and animal communities; habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; primitive, semi-primitive non-motorized, and semi-primitive motorized classes of dispersed recreation; reference landscapes; natural appearing landscapes with high scenic quality; traditional cultural properties and sacred sites; and other locally identified unique characteristics (e.g., uncommon geological formations, unique wetland complexes, exceptional hunting and fishing opportunities).

Numerous articles in the scientific literature similarly recognize the contribution of roadless and undeveloped lands to biodiversity, connectivity, and conservation reserve networks. For example, Loucks *et al.* (2003) examined the potential contributions of roadless areas to the conservation of biodiversity, and found that more than 25% of Inventoried Roadless Areas (IRAs) are located in globally or regionally outstanding ecoregions[60] and that 77% of IRAs have the potential to conserve threatened, endangered, or imperiled species. Arcese and Sinclair (1997) and Aycrigg *et al*. (2016) highlighted the contribution that IRAs could make toward building a representative network of conservation reserves in the United States, finding that protecting those areas would expand ecosystem representation, increase the area of reserves at lower elevations, and increase the number of large, relatively undisturbed refugia for species. Crist *et al.* (2005) looked at the ecological value of roadless lands in the Northern Rockies and found that protection of national forest roadless areas, when added to existing federal

[59] Final Environmental Impact Statement, Vol. 1, 3–3 to 3–7, *available at* http://www.fs.usda.gov/roaddocument/roadless/2001roadlessrule/finalruledocuments.

[60] Loucks *et al.* utilized an ecosystem ranking system developed by Ricketts *et al.* (1999):

> Ricketts *et al.* (1999) classified the biological importance of each ecoregion based on species distribution, i.e., richness and endemism, rare ecological or evolutionary phenomena such as large-scale migrations or extraordinary adaptive radiations, and global rarity of habitat type, e.g., Mediterranean-climate scrub habitats. They used species distribution data for seven taxonomic groups: birds, mammals, butterflies, amphibians, reptiles, land snails, and vascular plants (Ricketts *et al.* 1999). Each category was divided into four rankings: globally outstanding, high, medium, and low. The rankings for each of the four categories were combined to assign an overall biological ranking to each ecoregion. Ecoregions whose biodiversity features were equaled or surpassed in only a few areas around the world were termed "globally outstanding." To earn this ranking, an ecoregion had to be designated "globally outstanding" for at least one category. The second-highest category, or continentally important ecoregions, were termed "regionally outstanding," followed by "bioregionally outstanding" and "nationally important" (Ricketts *et al.* 1999).

conservation lands in the study area, would: (1) increase the representation of virtually all land cover types on conservation lands at both the regional and ecosystem scales, some by more than 100%; (2) help protect rare, species-rich, and often-declining vegetation communities; and (3) connect conservation units to create bigger and more cohesive habitat "patches."

Roadless lands are also responsible for higher quality water and watersheds. Anderson *et al.* (2012) assessed the relationship of watershed condition and land management status, and found a strong spatial association between watershed health and protective designations. DellaSala *et al.* (2011) found that undeveloped and roadless watersheds are important for supplying downstream users with high-quality drinking water, and that developing those watersheds comes at significant costs associated with declining water quality and availability. The authors recommend a light-touch ecological footprint to sustain healthy watersheds and the many other values that derive from roadless areas.

The U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service recognize that protecting and connecting undeveloped areas is an important strategy to enhance climate change adaptation. For example, the Forest Service National Roadmap for Responding to Climate Change establishes that increasing connectivity and reducing fragmentation are short- and long-term actions the agency should take to facilitate adaptation to climate change (USDA Forest Service 2011). The National Park Service also identifies connectivity as a key factor for climate change adaptation, along with establishing "blocks of natural landscape large enough to be resilient to large-scale disturbances and long-term changes." The agency states that "[t]he success of adaptation strategies will be enhanced by taking a broad approach that identifies connections and barriers across the landscape. Networks of protected areas within a larger mixed landscape can provide the highest level of resilience to climate change."[61] Similarly, the Climate Adaptation Strategy adopted by a partnership of governmental agencies including the U.S. Fish and Wildlife Service calls for creating an ecologically connected network of conservation areas (National Fish, Wildlife and Plants Climate Adaptation Partnership 2012).[62] The 2012 planning rule's substantive ecological sustainability provision sanctions this reserve design and landscape connectivity approach, requiring the Forest Service to formulate "plan components, including standards and guidelines, to maintain or restore [the] structure, function, composition, and

[61] National Park Service, Climate Change Adaptation webpage, http://www.nps.gov/subjects/climatechange/adaptation.htm (last visited Sept. 8, 2015). *See also* USDOI National Park Service (2010) (Objective 6.3 of agency's Climate Change Response Strategy is to "[c]ollaborate to develop cross-jurisdictional conservation plans to protect and restore connectivity and other landscape-scale components of resilience").

[62] Relevant goals and strategies include:

Goal 1: Conserve habitat to support healthy fish, wildlife, and plant populations and ecosystem functions in a changing climate.

Strategy 1.1: Identify areas for an ecologically-connected network of terrestrial, freshwater, coastal, and marine conservation areas that are likely to be resilient to climate change and to support a broad range of - fish, wildlife, and plants under changed conditions.

Strategy 1.2: Secure appropriate conservation status on [high priority areas] to complete an ecologically-connected network of public and private conservation areas that will be resilient to climate change and support a broad range of species under changed conditions.

Strategy 1.4: Conserve, restore, and as appropriate and practicable, establish new ecological connections among conservation areas to facilitate fish, wildlife, and plant migration, range shifts, and other transitions caused by climate change.

connectivity" of terrestrial and aquatic ecosystems and watersheds, taking into account stressors such as climate change. 36 C.F.R. § 219.8(a)(1).

The designated areas chapter of the forest assessment report for the Rio Grande National Forest does an exceptional job cataloguing the ecological – as well as social and economic – benefits associated with wilderness and roadless area protection.[63] The assessment recognizes that "[i]ncreasing the size of current designated wilderness areas is . . . an important option that can help support biological diversity and protect habitat for rare and endangered plant and animal species."

Despite these benefits, the DEIS primarily treats recommended wilderness as a management/use issue, *see*, *e.g.*, DEIS at 12, and fails to meaningfully analyze the significant ecological and wildlife impacts associated with recommending qualifying areas for wilderness designation, or protecting them through other conservation-oriented designations or management prescriptions. The DEIS briefly acknowledges that "Alternative C would increase the range of elevations and increase the biodiversity of areas recommended for inclusion in the [NWPS] along the west slope of the Sierra Nevada," and that the recommended additions to the Monarch and Ansel Adams wilderness areas under Alternative C would enhance the representation of certain ecosystem types that are not currently within Forest Service wilderness areas or support diverse plant and animal communities. DEIS at 516; *see also* DEIS Appx. B at 25, 228, & Evaluation Narratives (integrating ecosystem representation information submitted by The Wilderness Society into the wilderness evaluation process). We appreciate the Forest Service meaningfully addressing ecosystem representation, as required under the 2012 planning rule. *See*, *e.g.*, 36 C.F.R. § 219.1(c) ("Plans will guide management of [National Forest System] land so that they . . . consistent of ecosystems and watersheds with ecological integrity and diverse plant and animal communities . . . ."); *id.* § 219.9(a)(2) (plans must "maintain or restore the diversity of ecosystems and habitat types[, including r]are . . . plant and animal communities").[64] However, ecosystem representation is just one component of the ecological benefits associated with recommended wilderness and other conservation oriented designations, and the DEIS generally fails to meaningfully address the others.

The DEIS contains only a three-paragraph wilderness sub-section under Revision Topic 2: Ecological Integrity. DEIS at 346. The sub-section correctly notes that wilderness areas "can benefit species by precluding management activities (like timber harvest) that might reduce habitat quality, and by limiting mechanized and motorized activities such as mountain biking and off-highway-vehicle use that could cause breeding disturbance." It also notes that "wilderness management areas are also locations where wildfires are often managed to meet resource objectives, such as restoring fire as a key ecosystem process in Sierra systems, which can

[63] Rio Grande National Forest, Assessment 15: Designated Areas at 20-22 (March 2016), *available at* http://www.fs.usda.gov/detailfull/riogrande/landmanagement/projects/?cid=fseprd479414&width=full.

[64] *See also* FSH 1909.12, ch. 10, § 14(1)(4)(c) (in assessing the potential need and opportunity for additional designated areas, assessment should address whether there are "specific land types or ecosystems present in the plan area that are not currently represented or minimally represented"); FSH 1909.12, ch. 70, § 72.1(4) (in evaluating the degree to which potential wilderness areas "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value," Forest Service to address "[r]are plant or animal communities or rare ecosystems," with "rare" being "determined locally, regionally, nationally, or within the system of protected designations").

substantially improve habitat condition, heterogeneity, structural diversity, and species composition of vegetation." Yet, the DEIS goes on to make two counter-arguments that lack scientific references and specific examples. The first is that "recommended wilderness management direction can also impact species by precluding or limiting restoration activities." This statement contradicts the previous statement that wildfire itself is a key restoration tool and does not specify how wilderness recommendation would limit other effective restoration activities, such as prescribed fire. Second, the DEIS states that "in areas where vegetation and fuels have been impacted by past management, wildfires are becoming increasingly large and have high-severity impacts." It does not explain, however, how, if past management is a driver of increased fire severity, future management will decrease fire severity.

The ecological benefits of choosing Alternative C rather than Alternative B for recommended wilderness are likely to be highly significant – particularly given the Forest Service's failure to consider any meaningful protections for roadless areas not recommended for wilderness designation (see Section X, below). The failure to meaningfully analyze those impacts is a violation of NEPA, which requires the Forest Service to take a "hard look" at the environmental consequences of a proposed action, including its direct, indirect, and cumulative effects. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989); 42 U.S.C. § 4332(2)(C); 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. The required hard look encompasses effects that are "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative." 40 C.F.R. § 1508.8. For instance, when analyzing the consequences of Alternative B, the DEIS acknowledges that wilderness recommendations on the Inyo National Forest would enhance connectivity between large protected areas, thereby maintaining wildlife corridors and bird migration routes and benefiting species richness. DEIS at 520 (citing Bio-Regional Assessment finding that "connectedness of open space, species habitat, and ecological processes are important to biodiversity and ecological integrity"). Yet the analysis does not address the enhanced connectivity, biodiversity, and ecological integrity benefits that would be achieved through additional wilderness recommendations under Alternative C, instead focusing on how that alternative "would limit future development of mountain bike and off-highway vehicle recreation." *See id.* at 520-21.

Recommendations: The final EIS must recognize and analyze the significant ecological benefits associated with recommended wilderness and other conservation designations and integrate that information into the analysis of alternatives for recommended wilderness and into the analysis of how the plans provide for ecological sustainability and species diversity. This will require a revised or supplemental DEIS. *See* 40 C.F.R. § 1502.9(a) & (c).

E. The Forest Service should adopt a strengthened Alternative C for recommended wilderness.

As described in detail in the attached Appendices A, B, and C, areas included in Alternative C, as well as those improperly excluded from Alternative C on the Sierra and Sequoia National Forests, are highly deserving of wilderness recommendation. As the DEIS recognizes, Alternative C "would increase the range of elevations and increase the biodiversity of [recommended wilderness areas] along the west slope of the Sierra Nevada" (DEIS at p. 516) –

critically important components of achieving ecological integrity, habitat connectivity, species diversity, and climate change resiliency.

For instance, Appendices A and B highlight a number of rugged and unique roadless areas comprised of oak woodlands and other low-elevation ecosystems. These areas – which include, but are not limited to, Cat's Head Mountain, Oat Mountain, Soaproot, and Devil Gulch – present an important opportunity to protect ecosystems that are currently under-represented in the NWPS – a key conservation strategy in the face of climate change. *See* Dietz *et al.* 2015; Belote *et al.* 2016. These areas also provide opportunities for hiking and other forms of primitive recreation during the winter and spring months when higher elevation areas are snow-covered, as well as important wildlife habitat and linkages.

Appendix C highlights a number of areas included in Alternative C on the Inyo National Forest that are particularly deserving of protection as recommended wilderness. For instance, the Glass Mountains offer a unique east-west connection between the Sierra Nevada and the Great Basin, while Soldier Canyon offers an important north-south bridge connecting the White Mountains to the Inyo Mountains. Dexter Canyon offers unparalleled geographic variety and ecological richness, while the Excelsior IRA offers ecologically critical water resources as part of an amazingly wild and untouched western Great Basin roadless complex.

Recommendations: The final plans should adopt a strengthened Alternative C for recommended wilderness that includes important areas that were improperly excluded, including the Bright Star Wilderness addition, Rattlesnake/Durwood Creek watersheds in the Golden Trout addition, Slate Mountain, Long Canyon, Oat Mountain, and Dennison Peak on the Sequoia, and Cat's Head Mountain and Soaproot on the Sierra. [65]

F. Management of Recommended Wilderness

We are pleased to see that the forests are proposing to treat recommended wilderness as unsuitable for motorized and mechanized transport. DEIS at 524; Draft Inyo Plan at 54-55 (MA-RWLD-STD-01, prohibiting new non-conforming projects or activities; MA-RWLD-SUIT-02-04, motorized use, over-snow vehicle travel, and mechanized transport not suitable). This approach is consistent with the agency's obligation to manage those areas to preserve their suitability for wilderness designation by Congress. *See* 36 C.F.R. § 219.10(b)(1) (plans must "protect and maintain the ecological and social characteristics that provide the basis for [a recommended wilderness area's] suitability for wilderness designation"); FSM 1923.03(3) ("Any area recommended for wilderness . . . designation is not available for any use or activity that may reduce [its] wilderness potential."). We agree with the agency's rationale for excluding from detailed analysis an alternative that would allow non-conforming uses to continue in recommended wilderness, due to the adverse impacts on a number of wilderness characteristics and the enhanced monitoring that would be necessary. *See* DEIS at 44-45. In addition, permitting non-conforming uses to continue in recommended wilderness imposes a significant barrier to achieving permanent protection through congressional designation by developing a constituency

[65] The Sierra Club supports the wilderness recommendations in this letter for the Sierra and Sequoia National Forests. For the Inyo National Forest, the specific areas supported by the Sierra Club are listed in Exhibit IX.9.

for the continuation of that use. Time and again Congress has shown that it is far less likely to designate an area as wilderness that contains long-established motorized or mechanized uses, regardless of whether the agency has recommended the area. This impediment constitutes the sort of clear reduction in wilderness potential that the Forest Service must avoid in managing recommended wilderness.

The final plans should retain and enhance direction that recommended wilderness be closed to motorized and mechanized uses. First, the Sierra and Sequoia National Forests should adopt the plan components that are currently in the Inyo National Forest's draft plan for any recommended wilderness in their final plans. In addition to the standard and suitability determination included in the Inyo draft plan, the final plans should include direction to ensure recommended wilderness is managed to preserve its suitability for designation and wilderness potential. An additional standard should require that the areas be managed exclusively for non-motorized and non-mechanized uses. The current standard in the Inyo draft plan is worded to prohibit only *new* non-conforming projects or activities and so does not clearly apply to *existing* non-conforming uses. Recreational Opportunity Spectrum classifications in the final plans should categorize recommended wilderness as primitive or semi-primitive non-motorized, and another standard should require that the areas be managed to maintain, restore, and enhance those settings. Finally, plan components should ensure that fire management in recommended wilderness is identical to that in designated wilderness.

Recommended wilderness also warrants special protection under President Obama's November 2015 Presidential Memorandum on Mitigation, which establishes the overarching policy that agencies must "avoid and then minimize harmful effects to land, water, wildlife, and other ecological resources (natural resources) caused by land- or water-disturbing activities, and to ensure that any remaining harmful effects are effectively addressed, consistent with existing mission and legal authorities." Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment, § 1 (Nov. 3, 2015).[66] The memorandum directs agencies to develop a clear and consistent approach to applying this mitigation hierarchy to their activities and the projects they approve. In doing so, agencies must recognize that there are places identified in existing law and policy to have irreplaceable character, where impacts should be avoided, rather than minimized or compensated for. The memorandum defines "irreplaceable natural resources" as "resources recognized through existing legal authorities as requiring particular protection from impacts and that because of their high value or function and unique character, cannot be restored or replaced." *Id.* § 2(d). Recommended wilderness areas clearly fit this definition, and should be recognized as irreplaceable in forest plans. Indeed, the memorandum directs agencies to use large-scale plans and analyses such as forest plans to "inform the identification of areas where development may be most appropriate, where high natural resource values result in the best locations for protection and restoration, or where natural resource values are irreplaceable." *Id.* § 1. Consistent with these policies, the final forest plans should recognize recommended wilderness areas – as well as designated, suitable, and eligible Wild & Scenic Rivers, Research Natural Areas, National Scenic Trails, Inventoried Roadless Areas, and other designated areas with high social or ecological

[66] *Available at* https://www.whitehouse.gov/the-press-office/2015/11/03/mitigating-impacts-natural-resources-development-and-encouraging-related.

values – as irreplaceable resources and include plan components to ensure that project-level decisions avoid adverse impacts to them.[67]

Recommendations: The final plans should retain and strengthen the prohibition on motorized and mechanized uses in recommended wilderness. An additional standard should require that the areas be managed exclusively for non-motorized and non-mechanized uses. Recreational Opportunity Spectrum classifications in the final plans should categorize recommended wilderness as primitive or semi-primitive non-motorized, and another standard should require that the areas be managed to maintain, restore, and enhance those settings. Plan components should ensure that fire management in recommended wilderness is identical to that in designated wilderness. The final plans should also recognize recommended wilderness areas and other designated areas as irreplaceable resources in the context of the Presidential Memorandum on Mitigation, and include plan components to ensure that project-level decisions avoid adverse impacts to them.

X. Inventoried Roadless Areas

As described in Section IX(D), above, national forest roadless areas provide a host of social and ecological benefits, including clean air and drinking water, diverse plant and animal communities, habitat for imperiled species, backcountry recreation opportunities, and reference landscapes, among others. *See* Roadless Area Conservation Rule (RACR), 66 Fed. Reg. at 3245-47 (Jan. 12, 2001). Due to those benefits, we identified roadless area management as a significant issue in our scoping comments that must be analyzed under NEPA, requested that the Forest Service thoroughly examine the impacts associated with placing inventoried roadless areas under non-wilderness management prescriptions, and articulated why protective management of those areas is necessary.[68] In addition, The Wilderness Society and California Wilderness Coalition made specific recommendations for certain high-value roadless areas on the Sierra and Sequoia National Forests that should be managed in a backcountry setting that would preserve their roadless, backcountry, and non-motorized character.[69]

Thus, we were very disappointed to see no consideration of special management for inventoried roadless areas (IRAs) – whether existing IRAs protected under the RACR, or newly inventoried areas under the Chapter 70 process. Instead, the draft plans simply state that IRAs protected under the RACR will be managed pursuant to forest-wide plan components, subject to the

[67] The Forest Service is in the early stages of developing a regulation and associated directives to implement the policies in the Presidential Memorandum. Because these agency policies will not be finalized prior to development of a final EIS and final plans for the Inyo, Sierra, and Sequoia and because the final plans will likely govern forest management for decades to come, the Forest Service should directly implement the policies as articulated in the Presidential Memorandum itself. In addition, because the Presidential Memorandum was not issued until more than a year after the scoping period for the plans, we were unable to raise this issue in our previous comments. Accordingly, the issue should not be considered waived because we failed to raise it at scoping.

[68] *See, e.g.*, Sierra Forest Legacy *et al.*, Scoping Comments at 13 (Sept. 29, 2014).

[69] *See* Exhibits IX.7 & IX.8 (Nov. 17, 2014 recommendations for 32,012 acres on the Sierra and 22,087 acres on the Sequoia); National Forests in the Sierra Nevada: A Conservation Strategy at III.A-5 (Aug. 2012) (defining "backcountry management area" as "an inventoried roadless area or citizen inventoried roadless area that do[es] not contain any national forest system roads or motorized trails" and for which management objectives include "preserv[ing] the roadless and backcountry character," "manag[ing] them under the Roadless Area Conservation Rule," and "prohibiting motorized over-snow vehicle use and the construction of new motorized trails").

restrictions imposed by the Rule. Inyo Draft Plan at 82 (26% of the forest); Sierra Draft Plan at 75 (146,000 acres); Sequoia Draft Plan at 76 (29% of the forest). The draft plans do not identify where those IRAs are located, nor do they articulate the relevant RACR restrictions. This is equivalent to having a designated scenic byway or national scenic trail on your forest, yet failing to identify in the overarching land management plan where that byway or trail is located and what legal restrictions apply. If the plans do not communicate to the public and land managers where designated areas like IRAs are located, there will almost surely be mistakes, and roadless values will likely be eroded over the life of the plan.

Instead, the plans must ensure compliance with the RACR and that roadless values are not undermined. The most straightforward way to accomplish this is to include all the IRAs (that are not protected as recommended wilderness or under other, more stringent management prescriptions) as a unique management area. The plans would include for the IRA management area a desired condition aimed at advancing roadless characteristics, standards to ensure compliance with the RACR and protection of roadless characteristics, and other relevant plan components, such as prioritizing road decommissioning (see Section XII, below, addressing roads and infrastructure). New roadless areas identified through the Chapter 70 wilderness inventory should be subject to the same prescriptions.

In addition, ROS alternatives should account for and reflect roadless values, with important IRAs that are not recommended for wilderness designation subject to a year-round primitive, or semi-primitive, non-motorized prescription. By contrast, the current draft plans would allocate significant proportions of roadless areas – including highly deserving areas that would be recommended as wilderness under Alternative C – to motorized ROS prescriptions. *See* Maps B-D, attached (depicting draft plan ROS classifications and their overlap with recommended wilderness under Alternatives B and C). Excluding Alternative B recommended wilderness, the draft plans would allocate over 63% of Alternative C recommended wilderness acreage and over 71% of the final wilderness inventory acreage to motorized ROS prescriptions. *See* Table, below. The draft plans would allocate nearly 90% of the areas The Wilderness Society and California Wilderness Coalition proposed for backcountry management to motorized ROS prescriptions.

For example, a number of roadless areas we recommended for wilderness designation and that would be recommended for wilderness designation under Alternative C, including Devil Gulch (Polygon 772), Chico (Polygon 1408), Domeland south (Polygon 1394), and Domeland north (Polygon 1431), are under motorized ROS prescriptions in the draft plans. The DEIS includes no discussion of the social or ecological impacts associated with zoning these important roadless areas for motorized uses.

There does not appear to be any analysis or comparison of management options for inventoried roadless areas in the DEIS. This is a violation of NEPA. First, roadless area management is a significant issue, requiring a hard look under NEPA. *See* 40 C.F.R. § 1501.7 (EIS must analyze in depth all "significant issues"); *id.* § 1502.1 (EIS "shall provide full and fair discussion of significant environmental impacts" and "shall focus on significant environmental issues and alternatives"). Second, the failure to analyze different options for roadless area management results in an inadequate range of alternatives. *See* 40 C.F.R. § 1502.1 (agencies must "[r]igorously explore and objectively evaluate all reasonable alternatives").

The failure to provide for roadless area management is likely also a violation of the 2012 planning rule. First, given the ecological importance of roadless areas, it may contribute to the draft plans' failure to provide for ecological sustainability and species diversity. *See* Section IV, above (addressing the diversity requirement). Second, plan decision documents are required to identify or describe what management direction is provided for lands included in the Chapter 70 inventory but not recommended for wilderness designation. FSH 1909.12, ch. 70, § 74. Absent an analysis of what management should apply to those lands, any decision that those areas will not be subject to special management will lack support in the record. Finally, "[p]lans must comply with all applicable laws and regulations." 36 C.F.R § 219.1(f). To the extent that the draft plans currently fail to ensure adequate protection of roadless areas (by, for example, failing to even identify where existing IRAs protected under the RACR are located), they fail to comply with the RACR.

Recommendations: The Forest Service must meaningfully consider protective management for IRAs. This will require a revised or supplemental DEIS. *See* 40 C.F.R. § 1502.9(a) & (c). At a minimum, the final plans must ensure compliance with the RACR by identifying the locations of IRAs and providing plan components to ensure protection of roadless characteristics. To do so, the final plans should adopt a management area that encompasses IRAs protected under the RACR, as well as new roadless areas identified through the Chapter 70 inventory but not recommended for wilderness designation. ROS settings should reflect roadless values, with important IRAs zoned for primitive or semi-primitive non-motorized uses.

XI. Other Designated Areas

We are extremely disappointed that the DEIS and draft plans do not consider other administrative designations, beyond recommended wilderness and eligible Wild & Scenic Rivers. The 2012 Planning Rule requires plans to "[i]dentify existing designated areas [other than recommended wilderness and eligible Wild and Scenic Rivers], and determine whether to recommend any additional areas for designation." 36 C.F.R. § 219.7(c)(2)(vii). The rule defines designated area broadly as "[a]n area or feature identified and managed to maintain its unique special character or purpose." *Id.* § 219.19. Areas designated through the forest planning process have traditionally included research natural areas (RNAs) and special interest areas such as botanical, geological, scenic, zoological, paleontological, historical, or recreational areas. *See* FSH 1909.12, ch. 20, § 24 – Exhibit 01. The intent behind the requirement is to "[r]ecommend areas where doing so would help carry out the distinctive role and contributions of the plan area in the broader landscape or contribute to achieving desired conditions for the plan area." *Id.* § 24(1)(b). Plans "must include plan components, including standards or guidelines, to provide for . . . [a]ppropriate management of other designated areas or recommended designated areas in the plan area, including research natural areas." 36 C.F.R. § 219.10(b)(1)(vi).

The requirement to consider special designations and determine whether to recommend additional designated areas is just one of the non-discretionary duties enumerated in section 219.7(c)(2) of the planning rule, which include determining whether to recommend areas found suitable for inclusion in the NWPS, identifying the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System, and identifying the maximum quantity of timber that

may be removed from the planning area. Collectively, the requirement to consider a suite of conservation-oriented designations presents an important opportunity to identify the most special and unique places on our national forests and create a network of inter-connected protected areas that will help forests achieve the overarching ecological sustainability, species diversity, sustainable recreation, and climate change adaptation goals of the 2012 planning rule. Indeed, the best available scientific information demonstrates that designated and connected conservation reserve systems are critically important in conserving biological diversity and ecological processes and in mitigating system stressors. *See* Section IX(D), above (describing ecological benefits of protected natural areas). Special designations provide an opportunity to address unmet ecological goals such as protection and enhancement of habitat connectivity and ecosystem representation.[70] For instance, the Forest Service should consider designating a network of RNAs that represent the full diversity of ecosystems found across the forests and whose size and number are sufficient to adequately represent botanical and other ecological features and to be resilient to natural disturbances, climate change, and other anthropogenic stressors.[71] Because of their high conservation value, the Forest Service should consider for RNA or other special designation, areas suitable for inclusion in the NWPS that it chooses not to recommend for wilderness designation. *See* Section X, above (addressing failure of the plans to consider protections for inventoried roadless areas).

Despite the mandatory planning rule requirement, there is no indication in the DEIS or draft plans that any determination whether to recommend additional designated areas was made, much less meaningful consideration or analysis of opportunities for additional administrative designations. This is both a planning rule violation and a NEPA violation, as we have repeatedly raised the requirement to consider special designations as a significant issue that must be analyzed in the plan EIS. *See* 40 C.F.R. § 1501.7 (EIS must analyze in depth all "significant issues"); *id.* § 1502.1 (EIS "shall provide full and fair discussion of significant environmental impacts" and "shall focus on significant environmental issues and alternatives").[72]

To remedy these deficiencies, the Forest Service must revise its alternatives to include recommendations for additional designated areas such as RNAs and special interest areas. Recommendations for designated areas should incorporate a range of ecological needs and

[70] *See* FSH 1909.12, ch. 10, § 14 (relevant considerations in assessing the need and opportunity for special designations include, among other things, whether there are "specific land types or ecosystems present in the plan area that are not currently represented or minimally represented within the wilderness system or system of research natural areas" or "important ecological roles that could be supported by designation").

[71] *See* FSM 4063.02 (objectives of RNAs include "[m]aintain[ing] a wide spectrum of high quality representative areas that represent the major forms of variability . . . that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity;" "[p]reserve[ing] and maintain[ing] genetic diversity;" "[p]rotect[ing] against human-caused environmental disruptions;" and "[s]erv[ing] as a baseline area for measuring long-term ecological changes").

[72] We have raised the need to address administrative designations throughout the planning process, including in the following comment letters: Sierra Forest Legacy *et al.*, Feedback on Draft Sierra Forest Assessment at 36-37 (Sept. 19, 2013); Sierra Forest Legacy *et al.*, Comments on Draft Sequoia Forest Assessment at 51 (Oct. 16, 2013); Sierra Forest Legacy *et al.*, Comments on Draft Inyo Forest Assessment at 45-47 (Dec. 16, 2013); Sierra Forest Legacy *et al.*, Comments on Preliminary Need for Change at 5-8 (Jan. 31, 2014); Sierra Forest Legacy *et al.*, Comments on Need to Change Analysis, Desired Conditions, and Wilderness Inventory at 26-28 (June 30, 2014); Sierra Forest Legacy *et al.*, Scoping Comments at 7-8 & Appx. A; The Wilderness Society *et al.*, Consideration of Special Designations in Plan Revisions for Sierra, Sequoia, and Inyo National Forests (Nov. 18, 2014) (Exhibit XI.1).

values, including ecological representation, supported by the best available scientific information, as well as recreation, scenic, and visitor experience opportunities. The Forest Service should prioritize special designation of areas that are suitable for inclusion in the NWPS that the agency chooses not to recommend for wilderness designation. The agency should also prioritize areas currently identified in the DEIS and draft plans as having important ecological values, such as wetlands, meadows, and critical aquatic refuges. Meaningful analysis of potential recommendations for additional designated areas will require a revised or supplemental DEIS. *See* 40 C.F.R. § 1502.9(a) & (c). Based on that analysis, the Forest Service can then determine whether to recommend any additional areas for designation, as required.

Interestingly, the Inyo draft plan includes a goal that "[a]ll qualified botanical, aquatic and geologic research natural area candidates are identified and recommended for establishment." Draft Inyo Plan at 84 (DA-RNA-GOAL-01). This goal appears to suggest that additional RNAs may be identified and recommended over the life of the plan. While we would certainly support identification and recommendation of additional RNAs, the agency is obligated to consider making those recommendations as part of the plan itself. If this goal is carried forward (and the forest is postponing the RNA-identification effort), it should be re-phrased as an objective to ensure the process is actually completed in a meaningful timeframe.

Recommendations: The forests must meaningfully consider and analyze recommendations for designated areas such as RNAs and special interest areas, and make a supported determination whether to recommend any additional areas. This will necessarily require a revised or supplemental DEIS. The Forest Service should prioritize special designation of areas suitable for inclusion in the NWPS that are not recommended for wilderness designation in the final plans, as well as other areas currently identified in the DEIS and draft plans as having important ecological values, such as wetlands, meadows, and critical aquatic refuges.

XII. Forest Road System

We are disappointed that the significant impacts associated with the forest road system are not meaningfully analyzed in the DEIS or addressed as a revision topic in the draft plans. In particular, the plans fail to provide direction for achieving an ecologically and fiscally sustainable road system, as required under the 2012 Planning Rule and subpart A of the Forest Service travel management regulations, 36 C.F.R. part 212.

A. Background and Regulatory Framework

1. The best available scientific information shows that the forest road system is economically and environmentally unsustainable.

The Inyo, Sierra, and Sequoia National Forests provide a range of significant environmental and societal benefits, including clean air and water, habitat for myriad wildlife species, and outdoor recreation opportunities for millions of visitors and local residents each year. The forests' extensive and decaying road systems, however, pose a principle threat to their ability to provide critical environmental, ecosystem, and recreation services into the future. Nationwide, the national forests contain over 370,000 miles of system roads (excluding tens of thousands of

additional miles of unclassified, non-system, temporary, and user-created roads). That is nearly eight times the length of the entire U.S. Interstate Highway System. This road system is primarily a byproduct of the era of big timber; as such, it is often convoluted, unmanageable, and ineffective at meeting 21st-century transportation needs. Much of the system is also in a state of serious disrepair: as of 2015, the national forest road system had a nearly 3-billion-dollar maintenance backlog. USDA Forest Service 2015b.

The stories on the Inyo, Sierra, and Sequoia National Forests are similar. According to the forest assessment, the Inyo has 1,985 miles of system roads and 1,445 miles of roads under other jurisdiction. Inyo National Forest Assessment at 158.[73] "The overarching trend affecting the transportation system on the Inyo NF is declining budgets for repairs and maintenance. This trend is expected to continue, while national requirements for planning and maintenance continue to increase." Inyo National Forest Assessment at 159. The forest estimates annual road maintenance needs at $1.7 million annually to maintain the system to standard, while current annual funding is at only $545,000 and is expected to remain flat or decrease. *Id.*[74] As a result, deferred maintenance increases each year, with that figure at $26.9 million as of 2009. Inyo National Forest Assessment at 159. The forest's recent Travel Analysis Report (TAR) recognizes that "[d]ue to increasing use of the Forest's roads and decreasing budgets, the existing system is not sustainable," Inyo TAR at 28, and that "[a] sustainable road system includes environmental as well as economic sustainability," *id.* at 30.

According to the forest assessment, the Sequoia National Forest has 1,646 miles of system roads. Sequoia National Forest Assessment at 177. The annual cost to maintain the system is approximately $5.14 million, with a nearly $50 million maintenance backlog that continues to grow each year. *Id.* at 178-79. The assessment recognizes that "[e]xisting funding for maintenance is insufficient to fully maintain the [road system]." *Id.* at 179. Indeed, the forest's December 2014 draft TAR places the forest's average road program budget, including maintenance and other road related program responsibilities, at $400,000, or less than 8% of annual maintenance costs. Sequoia Draft TAR at 9. The result is that "[t]he network is in a deteriorating condition due to increased use and the continued deferral of maintenance and improvement needs." *Id.* at 11; *see also id.* at 30 ("Reduced maintenance could lead to erosion and deterioration of roads; closure due to safety concerns and deferred maintenance needs; and subsequent loss of recreational opportunity and quality of experience.").

According to the forest assessment, the Sierra National Forest has 2,805 miles of system roads. Sierra National Forest Assessment at 173. Deferred maintenance for the system is approximately $100 million, with the forest receiving approximately $425,000 annually to operate and maintain a road system that costs $1.6 million annually to maintain. *Id.* at 180. The Sierra has not yet made its travel analysis report available to the public.

While well-sited and maintained roads provide important services to society, the adverse ecological and environmental impacts associated with the Forest Service's massive and

[73] According to the forest's September 2015 Travel Analysis Report (TAR), system roads total 1,905 miles. Inyo TAR at 22. It is unclear what accounts for this discrepancy.

[74] Here too, the TAR differs from the assessment, stating that the cost to maintain the current system to standard is $880,000 annually, while estimated annual funds available for maintenance are only $512,000. Inyo TAR at 26.

deteriorating road system are well-documented. Those adverse impacts are long-term, occur at multiple scales, and often extend far beyond the actual "footprint" of the road. The attached literature review (The Wilderness Society 2014, Exhibit XII.1) surveys the extensive and best-available scientific literature (including the Forest Service's General Technical Report, Gucinski et al. 2001, synthesizing the scientific information on forest roads) on a wide range of road-related impacts to ecosystem processes and integrity on National Forest lands.

For example, erosion, compaction, and other alterations in forest geomorphology and hydrology associated with roads seriously impair water quality and aquatic species viability. The Wilderness Society 2014. Roads disturb and fragment wildlife habitat, altering species distribution, interfering with critical life functions such as feeding, breeding, and nesting, and resulting in loss of biodiversity. *Id.* Roads also facilitate increased human intrusion into sensitive areas, resulting in poaching of rare plants and animals, human-ignited wildfires, introduction of exotic species, and damage to archaeological resources. *Id.*

Climate change intensifies the adverse impacts associated with roads. For example, as the warming climate alters species distribution and forces wildlife migration, landscape connectivity becomes even more critical to species survival and ecosystem resilience. *Id.*[75] Climate change is also expected to lead to more extreme weather events, resulting in increased flood severity, more frequent landslides, altered hydrographs, and changes in erosion and sedimentation rates and delivery processes. The Wilderness Society 2014; Inyo National Forest Assessment at 160. Many National Forest roads, however, were not designed to any engineering standard, making them particularly vulnerable to these climate alterations. And even those designed for storms and water flows typical of past decades may fail under future weather scenarios, further exacerbating adverse ecological impacts, public safety concerns, and maintenance needs. USDA Forest Service 2010.

These road-related impacts are of significant concern on the Inyo, Sierra, and Sequoia National Forests. For instance, the forest assessments recognize that high road densities have fragmented certain habitat types, degraded the integrity of aquatic ecosystems, and disrupted soil water for meadow- and fen-dependent native species. *See* Inyo National Forest Assessment at 21, 44, 50. Roads are one of the major sources of sediment on the forests – a problem that is exacerbated by the massive maintenance backlog – and a significant barrier to aquatic connectivity. *See* Sequoia National Forest Assessment at 60, 62; Sierra National Forest Assessment at 32, 43, 46. Roads are also a key risk factor to numerous threatened and endangered species and potential species of conservation concern. *See* Inyo National Forest Assessment at 91, 94-96, 98-103; Sequoia National Forest Assessment at 96, 98, 100-101; Sierra National Forest Assessment at 78, 83-85, 87-90. Despite acknowledging these impacts, the assessments generally provide only the most limited information about the significant ecological impacts associated with the forest road systems. We provided additional relevant information about specific impacts associated with the forest transportation systems in our 2013 comments on the draft assessments, which we incorporate herein by reference.[76]

[75] *See also* USDA Forest Service 2011a (National Roadmap for Responding to Climate Change recognizes importance of reducing fragmentation and increasing connectivity to facilitate climate change adaptation).
[76] *See* Sierra Forest Legacy *et al.*, Feedback on Draft Inyo Forest Assessment at 33-45 (Dec. 16, 2013) (addressing watershed and terrestrial impacts and strategies to adapt transportation infrastructure to be sustainable in the face of

Other readily available Forest Service reports highlight additional environmental degradation associated with the transportation system on the Inyo, Sierra, and Sequoia National Forests. For example, the agency's Watershed Condition Framework characterizes the health and condition of national forest watersheds as properly functioning (good), functioning at risk (fair), or impaired (poor) based on a set of twelve condition indicators USDA Forest Service 2011b. One of the indicators is the condition of forest roads and trails based on open road density, road maintenance, proximity to water, and mass wasting. The attached map (Map XII.A) depicts the road and trail indicator score for watersheds on the Inyo, Sierra, and Sequoia National Forests.[77] The map shows that, particularly outside designated wilderness, a significant number of watersheds are in poor or fair condition as a result of transportation infrastructure.

2. Regulatory framework

a. Road management

To address its unsustainable and deteriorating road system, the Forest Service promulgated the Roads Rule in 2001. 36 C.F.R. part 212, subpart A, 66 Fed. Reg. 3206 (Jan. 12, 2001). The rule directs each National Forest to conduct "a science-based roads analysis," generally referred to as the travel analysis process. 36 C.F.R. § 212.5(b)(1).[78] Based on that analysis, forests must "identify the minimum road system [MRS] needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands." 36 C.F.R. § 212.5(b)(1). The Rule defines the MRS as:

> the road system determined to be needed [1] to meet resource and other management objectives adopted in the relevant land and resource management plan . . . , [2] to meet applicable statutory and regulatory requirements, [3] to reflect long-term funding expectations, [and 4] to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.

Id. Forests also must "identify the roads . . . that are no longer needed to meet forest resource management objectives and that, therefore, should be decommissioned or considered for other uses, such as for trails." *Id.* § 212.5(b)(2).[79]

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climate change); Sierra Forest Legacy *et al.*, Feedback on Draft Sequoia Forest Assessment at 38-42 (Oct. 16, 2013) (addressing risks to watersheds based on scientific information in Region 5's Travel Analysis Process Guidebook); Sierra Forest Legacy *et al.*, Feedback on Draft Sierra Forest Assessment at 27-32 (Sept. 19, 2013) (addressing watershed impairment, wildlife and habitat impacts, and air quality based on 2005 forest roads assessment).

[77] The relevant data can be found at http://www.fs.fed.us/publications/watershed/excel_WCC_attribute_info.xlsx.

[78] Forest Service Manual 7712 and Forest Service Handbook 7709.55, Chapter 20 provide detailed guidance on conducting travel analysis.

[79] The requirements of subpart A are separate and distinct from those of the 2005 Travel Management Rule, codified at subpart B of 36 C.F.R. part 212, which address off-highway vehicle use and corresponding resource damage pursuant to Executive Orders 11644, 37 Fed. Reg. 2877 (Feb. 9, 1972), and 11989, 42 Fed. Reg. 26,959 (May 25, 1977).

While subpart A does not impose a timeline for agency compliance with these mandates, the Forest Service Washington Office, through a series of directive memoranda, ordered forests to complete the initial travel analysis process and produce a travel analysis report (TAR) by the end of fiscal year 2015, or lose maintenance funding for any road not analyzed.[80] The memoranda articulate an expectation that forests, through the subpart A process, "maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns." They clarify that TARs must address *all* system roads – not just the small percentage of roads maintained for passenger vehicles to which some forests had limited their previous Roads Analysis Process reports or TARs. And they require that TARs include a list of roads likely not needed for future use. Nationwide, TARs are currently undergoing review by the Washington Office to ensure consistency with regulatory requirements and the directive memoranda.[81]

Once the TARs are finalized, the next step is "to use the travel analysis report to develop proposed actions to identify the MRS" and unneeded roads for decommissioning at a scale of the 6th HUC watershed or larger and undertake appropriate NEPA review. 2012 Weldon Memo.[82] "The MRS for the administrative unit is complete when the MRS for each subwatershed has been identified, thus satisfying Subpart A." *Id.* In addition, travel analysis recommendations must be meaningfully incorporated into land management planning decisions, as discussed in more detail in subsection 4(b), below.

b. Land management planning

The 2012 Planning Rule guides the development, amendment, and revision of forest plans, with an overarching goal of promoting the ecological integrity and ecological and fiscal sustainability of National Forest lands:

> Plans will guide management of [National Forest System] lands so that they are ecologically sustainable and contribute to social and economic sustainability; consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.

36 C.F.R. § 219.1(c). To accomplish these ecological integrity and sustainability goals, the rule imposes substantive mandates to establish plan components – including standards and guidelines

[80] Memorandum from Joel Holtrop to Regional Foresters *et al*. re Travel Management, Implementation of 36 C.F.R., Part 212, Subpart A (Nov. 10, 2010) (Exhibit XII.2); Memorandum from Leslie Weldon to Regional Foresters *et al*. re Travel Management, Implementation of 36 C.F.R., Part 212, Subpart A (Mar. 29, 2012) (Exhibit XII.3); Memorandum from Leslie Weldon to Regional Foresters *et al*. re Travel Management Implementation (Dec. 17, 2013) (Exhibit XII.4).

[81] *See* Memorandum from Leslie Weldon to Regional Foresters re Completion of Travel Management and Next Steps (Sept. 24, 2015) (Exhibit XII.5).

[82] For instance, Watershed Restoration Action Plans developed under the Watershed Condition Framework should include essential projects that implement TAR recommendations, and every project at the scale of the 6th HUC watershed or greater that implicates the road system should include in its purpose and need statement identification of the MRS and unneeded roads for decommissioning and implementation of actions identified in the TAR.

– that maintain or restore healthy aquatic and terrestrial ecosystems, watersheds, and riparian areas, and air, water, and soil quality. *Id.* § 219.8(a)(1)-(3); *see also id.* § 219.9(a) (corresponding substantive requirement to establish plan components that maintain and restore the diversity of plant and animal communities and support the persistence of native species). The components must be designed "to maintain or restore the structure, function, composition, and connectivity" of terrestrial, riparian, and aquatic ecosystems, *id.* § 219.8(a)(1) & (a)(3)(i); must take into account stressors including climate change, and the ability of ecosystems to adapt to change, *id.* § 219.8(a)(1)(iv); and must implement national best management practices for water quality, *id.* § 219.8(a)(4). The rule also requires the Forest Service to establish riparian management zones for which plan components "must ensure that no management practices causing detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment that seriously and adversely affect water conditions or fish habitat shall be permitted." *Id.* § 219.8(a)(3)(ii)(B). In addition, plans must include plan components for "integrated resource management to provide for ecosystem services and multiple uses," taking into account "[a]ppropriate placement and sustainable management of infrastructure, such as recreational facilities and transportation and utility corridors." *Id.* § 219.10(a)(3). Plan components must ensure social and economic sustainability, including sustainable recreation and access. *Id.* § 219.8(b). And the Forest Service must "use the best available scientific information" to comply with these substantive mandates. *Id.* § 219.3.

c. Climate change

Executive Order 13,653 provides direction on "Preparing the United States for the Impacts of Climate Change." The Order recognizes that "[t]he impacts of climate change – including an increase in prolonged periods of excessively high temperatures, more heavy downpours, an increase in wildfires, [and] more severe droughts . . . – are already affecting communities, natural resources, ecosystems, economies, and public health across the Nation," and that "managing th[o]se risks requires deliberate preparation, close cooperation, and coordinated planning . . . to improve climate preparedness and resilience; help safeguard our economy, infrastructure, environment, and natural resources; and provide for the continuity of . . . agency operations, services, and programs." Exec. Order 13,653, § 1 (Nov. 1, 2013). To that end, the Order requires agencies to take various actions aimed at making "watersheds, natural resources, and ecosystems, and the communities and economies that depend on them, more resilient in the face of a changing climate." *Id.* § 3. For example, "recognizing the many benefits the Nation's natural infrastructure provides, agencies shall, where possible, focus on program and policy adjustments that promote the dual goals of greater climate resilience and carbon sequestration." *Id.* Agencies also must develop and implement adaptation plans that "evaluate the most significant climate change related risks to, and vulnerabilities in, agency operations and missions in both the short and long term, and outline actions . . . to manage these risks and vulnerabilities." *Id.* § 5(a).

The Forest Service's 2014 climate adaptation plan recognizes that the wide range of environmental and societal benefits provided by our national forests "are connected and sustained through the integrity of the ecosystems on these lands." USDA Forest Service 2014. The plan highlights USDA's 2010-2015 Strategic Plan Goal 2 of "[e]nsur[ing] our national forests . . . are conserved, restored, and made more resilient to climate change, while enhancing

our water resources." *Id.*[83] And consistent with section 5(a) of Executive Order 13,653, the plan identifies numerous climate change risks – including increased wildfire, invasive species, water temperatures, extreme weather events, and fluctuating precipitation and temperature – that "pose challenges to sustaining forests and grasslands and the supply of goods and services upon which society depends, such as clean drinking water, forest products, outdoor recreation opportunities, and habitat." *Id.* With respect to transportation infrastructure specifically, the plan recognizes that, "[w]ith increasing heavy rain events, the extensive road system on NFS lands will require increased maintenance and/or modification of infrastructure (e.g. larger culverts or replacement of culverts with bridges)." *Id.* The adaptation plan points to a number of actions to address these risks. For example, the plan highlights the 2012 Planning Rule as a mechanism to ensure that "National Forest System . . . land management planning policy and procedures include consideration of climate change." *Id.*[84] The final directives to the planning rule echo the importance of designing plan components "to sustain functional ecosystems based on a future viewpoint" and "to adapt to the effects of climate change." FSH 1909.12, ch. 20, § .23.11. The adaptation plan also points to Forest Service Manual 2020, which provides "Ecological Restoration and Resilience" directives designed "to restore and maintain resilient ecosystems that will have greater capacity to withstand stressors and recover from disturbances, especially those under changing and uncertain environmental conditions, including climate change and extreme weather events." USDA Forest Service 2014.

The Council on Environmental Quality (CEQ) also recently reinforced the importance of integrating climate change into land management planning processes in its final guidance on addressing climate change in NEPA reviews. The guidance acknowledges that "[c]limate change is a fundamental environmental issue, and its effects fall squarely within NEPA's purview":

> Identifying important interactions between a changing climate and the environmental impacts from a proposed action can help Federal agencies and other decision makers identify practicable opportunities to reduce GHG emissions, improve environmental outcomes, and contribute to safeguarding communities and their infrastructure against the effects of extreme weather events and other climate-related impacts.

Council on Environmental Quality, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*, § I, 81 Fed. Reg. 51,866, (Aug. 5, 2016). The guidance goes on to recognize the increased vulnerability of resources including transportation infrastructure, due to a changing climate, and clarifies that NEPA requires agencies to analyze proposed actions and alternatives in the context of climate change, including the vulnerability of particular resources including transportation infrastructure, and to consider opportunities for climate adaptation and resilience. *Id.* § III(B).

[83] USDA's updated FY2014-FY2018 Strategic Plan retains Goal 2.

[84] *See also* 36 C.F.R. § 219.8(a)(1)(iv) (ecosystem integrity plan components must take into account stressors including climate change, and the ability of ecosystems to adapt to change); *id.* § 219.6(b)(3) (forest assessments must "[i]dentify and evaluate existing information relevant to the plan area for . . . the ability of terrestrial and aquatic ecosystems on the plan area to adapt to change"); *id.* § 219.5(a) (planning framework designed to allow the Forest Service "to adapt to changing conditions, including climate change"); *id.* § 219.12(a)(5)(vi) (monitoring programs must address "[m]easurable changes on the plan area related to climate change and other stressors").

3. Existing plan direction is inadequate to comply with regulatory requirements.

Existing plan direction for the Inyo, Sierra, and Sequoia National Forests does not meet the substantive requirements of subpart A or the 2012 Planning Rule. Specifically, the current plans do not offer direction on identifying or achieving a minimum road system, removing unneeded system roads, or otherwise promoting sustainable transportation infrastructure that helps maintain and restore ecological integrity. Moreover, current plan direction does not address the role of climate change, which likely will be dominant in road management decision-making over the life of the revised plans. Despite this, the forests concluded that "[n]ew or changed plan components would not likely affect the condition of transportation . . . infrastructure" and that "[c]urrent management direction carried forward in revised plans can provide the guidance needed to manage road and trail systems for resource protection." Inyo, Sequoia, and Sierra National Forests Need to Change Analysis at 6 (May 22, 2014). As we pointed out in response, these conclusions are unsupported, and the Forest Service may not rely on or otherwise incorporate existing plan direction to satisfy its duties under subpart A or the 2012 Planning Rule.[85] As explained below, the revised plans and corresponding NEPA process are the appropriate places to comprehensively assess and provide updated management direction on the forest road system and to ensure timely compliance with subpart A.

4. The Forest Service must address the road system in its plan revision.

a. The substantive requirements of the 2012 Planning Rule require meaningful plan direction on roads.

The substantive requirements of the 2012 Planning Rule require the Forest Service to comprehensively address the road system in its plan revision. Given the significant aggregate impacts of that system on landscape connectivity, ecological integrity, water quality, species viability and diversity, and other forest resources and ecosystem services, the Forest Service cannot satisfy the rule's substantive requirements without providing management direction for transportation infrastructure. As described above, plans must provide standards and guidelines to maintain and restore ecological integrity, landscape connectivity, water quality, and species diversity. 36 C.F.R. § 219.8(a). Those requirements simply cannot be met absent integrated plan components directed at making the road system considerably more sustainable and resilient to climate change stressors. The Forest Service's final directives on infrastructure recognize this: "[t]he central consideration in land management planning for infrastructure is that the integrated desired conditions and other plan components set a framework for the sustainable management of the plan area's infrastructure and mitigation of adverse impacts." FSH 1909.12, ch. 20, § 23.23l. To that end, plan components should "reflect the extent of infrastructure that is needed to achieve the desired conditions and objectives of the plan" and "provide for a realistic desired infrastructure that is sustainable and can be managed in accord with other plan components including those for ecological sustainability." *Id.* § 23.23l(1)(b); *see also id.* § 23.23l(2)(a)

[85] *See* Sierra Forest Legacy *et al.*, Comments on Need for Change Analysis at 8-12 (Jan. 31, 2014); Sierra Forest Legacy *et al.*, Comments on Revised Need for Change at 29-34 (June 30, 2014) (describing why the plan revision must address roads and infrastructure).

(desired condition for roads "should describe a basic framework for an appropriately sized and sustainable transportation system that can meet [identified access and other] needs").
Plan components also must ensure fiscal sustainability. 36 C.F.R. § 219.8(b); *see also id.* § 219.1(g) (plan components generally must be "within . . . the fiscal capability of the unit"); FSH 1909.12, ch. 20, § 23.23l(1)(c) (same). The forest road system, however, suffers from an extraordinary maintenance backlog of nearly 3 billion dollars, with inadequately maintained roads more likely to fail, causing corresponding damage to aquatic and other ecological systems and endangering public safety. As described above, the maintenance backlogs on the Inyo, Sierra, and Sequoia National Forests are significant and forecasted to continue growing. As with ecological integrity and sustainability, the Forest Service cannot satisfy its mandate to achieve fiscal sustainability absent plan components that remedy the unwieldy size and decaying nature of the road system. Recommended plan components to satisfy these substantive mandates and achieve a sustainable minimum road system are discussed in subsection C, below.

More generally, the revised plan is the logical and appropriate place to establish a framework for management of the forest road system. Plans "provide[] a framework for integrated resource management and for guiding project and activity decisionmaking." 36 C.F.R. § 219.2(b)(1); *see also id.* § 219.15(e) (site-specific implementation projects, including travel management plans, must be consistent with plan components). Plans allow the Forest Service to comprehensively evaluate the road system in the context of other aspects of forest management, such as restoration, protection and utilization, and fiscal realities, and to integrate management direction accordingly. Plans also provide and compile regulatory direction at a forest-specific level for compliance with the Clean Water Act, Clean Air Act, Endangered Species Act, and other federal environmental laws relevant to the road system and its environmental impacts. *See id.* § 219.1(f) ("Plans must comply with all applicable laws and regulations . . . ."). And plans allow forest managers and the public to clearly understand the management expectations around the road system and develop strategies accordingly. With frequent turnover in decision-making positions at the forest level, a plan-level management framework for the road system and transportation infrastructure is particularly critical. Moreover, with climate change anticipated to necessitate forest-wide upgrades and reconfigurations of transportation infrastructure, it is especially important that plans provide direction for identifying and achieving an environmentally and fiscally sustainable road system under future climate scenarios.

Lastly, the Forest Service does not have another planning vehicle to direct long-term and forest-wide management of the road system and to ensure compliance with current policy and regulatory direction. Travel Management Plans (TMPs) under subpart B of 36 C.F.R. part 212 are not a substitute for the integrated direction for transportation management that land management plans must provide. The main purpose of TMPs is to designate roads, trails, and areas that are open to motorized travel – not to achieve a sustainable transportation system, decommission unneeded roads, or otherwise meet the ecological restoration mandates of the 2012 Planning Rule.

b. The plan revision should address subpart A.

Complementing the substantive requirements of the 2012 Planning Rule, subpart A requires each National Forest to identify its minimum road system (MRS), as well as unneeded roads for decommissioning or conversion to other uses. 36 C.F.R. § 212.5(b)(1)-(2). As explained above, the MRS must, among other things, reflect long-term funding expectations. *Id.* § 212.5(b)(1). Completion of the travel analysis process is a crucial first step in achieving compliance with subpart A, but forests then must utilize that analysis to identify the MRS and unneeded roads for decommissioning and implement those decisions in order to achieve compliance with subpart A.

The plan revision is the appropriate place to ensure that subpart A's requirements will be met over the next 10 to 15 years, and to set standards and guidelines for achieving an environmentally and fiscally sustainable MRS through decommissioning or repurposing unneeded roads and upgrading the necessary portions of the system. Subpart A defines the MRS as that "needed for safe and efficient travel[;] for administration, utilization, and protection of [forest] lands[; and] to meet resource and other management objectives adopted in the relevant . . . plan." 36 C.F.R. § 212.5(b)(1). With forest plans determining the framework for integrated resource management and "an appropriately sized and sustainable transportation system," direction for identifying and achieving that MRS belongs in the forest plan. *See* FSH 1909.12, ch. 20, § 23.23l(2)(a). Indeed, the regulatory history of the Roads Rule makes clear that the Forest Service intended that forest plans would address subpart A compliance. In response to comments on the proposed Roads Rule, the Forest Service stated:

> The planning rule provides the overall framework for planning and management of the National Forest System. The road management rule and policy which are implemented through the planning process must adhere to the sustainability, collaboration, and science provisions of the planning rule. For example, under the road management policy, national forests and grasslands must complete an analysis of their existing road system *and then incorporate the analysis into their land management planning process*.

66 Fed. Reg. at 3209 (emphasis added).

If the revised plans do not provide plan direction towards achieving a sustainable MRS, it is unlikely that the Forest Service will satisfy the requirements of subpart A during the life of the plans (as evidenced by the lack of direction in the existing plans and the inability of forests to achieve environmentally and fiscally sustainable road systems to date). Forest managers and the public need forest-specific direction on how to achieve the desired MRS and ensure its sustainability in the face of climate change, all within realistic fiscal limitations of the unit. The purpose of a forest plan is to provide that direction, and it would be arbitrary for the Forest Service to fail to do so in its plan revision. At the very least, the revised plan must include standards and guidelines that direct compliance with subpart A within a reasonable timeframe following plan adoption.

Recommended plan components to satisfy the requirements of subpart A are provided in subsection C, below.

c. The Forest Service must analyze the significant impacts associated with the road system under NEPA.

In addition to the requirements of the 2012 Planning Rule and subpart A, NEPA requires the Forest Service to analyze its road system as part of the forest plan revision process. Because they constitute "major Federal actions significantly affecting the quality of the human environment," forest plan revisions require preparation of an environmental impact statement (EIS) under NEPA. 42 U.S.C. § 4332(2)(C); 36 C.F.R. § 219.5(a)(2)(i). The EIS must analyze in depth all "significant issues related to [the plan revision]." 40 C.F.R. § 1501.7; *see also id.* § 1502.1 (an EIS "shall provide full and fair discussion of significant environmental impacts" and "shall focus on significant environmental issues and alternatives"). Management of the forest road system and its significant environmental impacts on a range of forest resources undoubtedly qualifies as a significant issue that must be analyzed in the plan revision EIS.[86]

A robust NEPA analysis of the forest road system and its environmental and social impacts is especially critical in the context of climate change. As the Council on Environmental Quality's (CEQ) recent final guidance on addressing climate change in NEPA analyses recognizes,

> Climate change can make a resource, ecosystem, human community, or structure more susceptible to many types of impacts and lessen its resilience to other environmental impacts apart from climate change. This increase in vulnerability can exacerbate the effects of the proposed action. . . . Such considerations are squarely within the scope of NEPA and can inform decisions on whether to proceed with, and how to design, the proposed action to eliminate or mitigate impacts exacerbated by climate change. They can also inform possible adaptation measures to address the impacts of climate change, ultimately enabling the selection of smarter, more resilient actions.

CEQ Climate Change NEPA Guidance, § III(B)(2). Thus, the guidance clarifies that NEPA requires agencies to analyze proposed actions and alternatives in the context of climate change, including the vulnerability of resources such as transportation infrastructure, and to consider opportunities for climate adaptation and resilience. *Id.* § III(B).

Importantly, adequate analysis of the forest road system cannot be provided in a piecemeal fashion under other, individual resource topics in the EIS. That approach would preclude comprehensive analysis of the significant impacts associated with the road system and could result in fragmented and conflicting management direction that fails to satisfy the substantive mandates of the 2012 Planning Rule and subpart A.

Given the inadequate analysis in the DEIS and inadequate draft plan direction, the Forest Service will necessarily need to prepare a supplemental DEIS that properly analyzes the forest road systems and provides the public with a meaningful opportunity to comment on the issue. *See* 40 C.F.R. § 1502.9(c) (agency must prepare a supplemental DEIS where it "makes substantial

[86] NEPA analysis as part of a previous travel management planning process under subpart B does not satisfy the Forest Service's duty to comprehensively analyze the impacts of its road system in the EIS for the plan revision. As explained above, the purpose of the TMP is to designate existing roads and trails available for off-road vehicle use, not to identify and provide a framework for a sustainable road system.

changes in the proposed action that are relevant to environmental concerns" or "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts"); *California v. Block*, 690 F.2d 752, 771 (9th Cir. 1982) ("Only at the stage when the draft EIS is circulated can the public and outside agencies have the opportunity to analyze a proposal and submit comment. No such right exists upon issuance of a final EIS.").

B. The Draft Plans and DEIS Fail to Meaningfully Address Roads and Infrastructure

Our scoping comments made clear that the forest transportation system is a significant issue that must be meaningfully analyzed under NEPA. *See* 40 C.F.R. §§ 1501.7, 1502.1. While the DEIS gives roads some cursory and sporadic treatment in its analysis of other issues, such as watershed resilience to climate change, criteria for assessing landscape connectivity for certain species or vegetation types, aquatic and riparian ecosystem health, water quality and watershed condition, threats to listed species or species of conservation concern, and recreation access, *see, e.g.*, DEIS at 29, 39, 206, 265, 268, 285, 287, 291-92, 330, 335, 341, 436-45, 464, roads and their significant ecological and economic impacts are not meaningfully analyzed. This constitutes a violation of NEPA.

Nor do the draft plans provide any sort of comprehensive or meaningful direction on the road system. There is nothing in the draft plans to ensure that the forests identify and implement a sustainable minimum road system, as required by subpart A. *See* subsection A(4)(b), above. Nor is there meaningful direction to ensure that the bloated and decaying road system does not continue to degrade key components of ecological health and integrity, as required under the 2012 Planning Rule. *See* subsection A(4)(a), above. While a handful of recreation- or infrastructure-focused desired future conditions briefly touch on the transportation system, they do not go nearly far enough in defining what an ecologically and fiscally sustainable road system would look like, and the plans fail to include any other plan components to achieve those desired conditions.

For instance, two forest-wide recreation desired conditions in the draft plan for the Sierra National Forest mention a sustainable transportation system for purposes of providing recreational access. *See* Sierra Draft Plan at 42 (REC-FW-DC-06 & -08). But they do not address the transportation system in terms of ecological or fiscal sustainability, and the draft plan fails to include any other plan components to achieve the recreation-access-focused desired conditions. The infrastructure-specific desired conditions for the Sierra fail to provide any vision for achieving a sustainable minimum road system. Nor does the draft plan provide any other plan components to ensure compliance with subpart A. Appendix B of "Proposed and Possible Actions" for the Sierra includes "[c]ompleting Travel Analysis (Subpart A) of the 2005 Travel Management Rule (Rule 36 CFR 212) in one priority watershed." *Id.* at 140. Given that the forest is already required to have completed its "travel analysis," presumably this is meant to refer to completing subpart A compliance, which entails implementing recommendations from the travel analysis process in identifying a minimum road system and unneeded roads for decommissioning. Achieving subpart A compliance is not an optional possibility over the life of

the revised plan. Instead, it is a regulatory requirement, and the revised plan should provide direction for ensuring that it occurs across the *entire* forest – not just in one priority watershed.

The draft plan for the Sequoia National Forest includes as a desired condition for infrastructure, "[a]n efficient forest transportation system, administrative sites, and other infrastructure and facilities are in place and maintained at least to the minimum standards appropriate for planned uses and the protection of resources." Draft Sequoia Plan at 48 (INFR-FW-DC-01). While an efficient and well-maintained transportation system is critically important, this desired condition does not go far enough to describe the ecologically and fiscally sustainable minimum road system that is required under subpart A and the 2012 Planning Rule. Nor are there any other plan components to ensure that this limited desired condition is accomplished over the life of the plan. Appendix B of "Proposed and Possible Actions" for the Sequoia includes "[n]aturalize or decommission unauthorized roads and system roads to create a more cost-effective road system and to restore natural resources impacted by Roads." *Id.* at 139. Road decommissioning is critical to addressing the forest's unsustainable road system and should be integrated into plan components – not buried in a laundry list of optional actions.[87] Another possible action on the Sequoia is to "[c]onstruct and close new temporary and permanent roads to support ecosystem restoration activities." Draft Sequoia Plan at 139. This warrants clarification. Current Forest Service policy requires reductions in the oversized forest road system, and plans should not be encouraging construction of new roads – particularly not permanent roads.

The draft plan for the Inyo National Forest includes as a desired condition for infrastructure, "[a] *minimum and efficient forest transportation system*, administrative sites and other infrastructure and facilities are in place and maintained at least to the minimum standards appropriate for planned uses and the protection of resources." Draft Inyo Plan at 44 (INFR-FW-DC-01) (emphasis added). This desired condition properly acknowledges elements of a sustainable minimum road system, and should be retained and strengthened in the final plan, consistent with the recommended desired condition in subsection C, below. Despite the promising language in this desired condition, there are no other plan components designed to get the forest to that "minimum and efficient forest transportation system." Appendix B also includes the same "Proposed and Possible Actions" as the Sequoia, *id.* at 145, which should be addressed as discussed in the preceding paragraph.[88]

Another important element that is missing from the treatment of the forest road system is the significant tree mortality on the Sierra and Sequoia National Forests, which is not addressed in the environmental baseline, effects analysis, or draft plans. Tree mortality likely will affect roads in a number of significant ways that may exacerbate the fiscal and ecological impacts associated with the system. For instance, tree mortality along roadways poses a public safety concern and will likely require additional maintenance, while additional downed wood is likely to plug undersized culverts. These and other impacts must be fully analyzed, and the draft plans should incorporate direction to address the issue. For instance, plan direction should require

[87] The Sequoia's draft TAR identifies a number of roads that should be priorities for decommissioning, including 117 miles of high risk roads, and 418 miles of low benefit roads. Draft Sequoia TAR at 35.

[88] With respect to targets for decommissioning, the Inyo TAR identified 159 miles of low benefit roads (about 9% of the system), and 258 miles of high risk roads (about 15% of the system). Inyo TAR at 42. The TAR also recommended about 202 miles of road (about 11% of the system) as "likely not needed for future use." *Id.* at 53-54.

consideration of the degree of road associated mortality in prioritizing roads for maintenance, closure, and/or decommissioning based on public safety concerns. Plan direction also should address the potential for accumulation of additional downed wood by setting priorities for culvert upgrades and maintenance.

Overall, the draft plans provide wholly inadequate direction to address the bloated and deteriorating forest road systems and their significant ecological and fiscal impacts. The following section recommends plan components that are necessary to achieve an ecologically and fiscally sustainable road system and that should be included in the final plans.

C. Recommended Plan Components to Achieve an Ecologically and Fiscally Sustainable Road System

The plan components of the revised forest plans should integrate a variety of approaches to satisfy the substantive mandates of the 2012 Planning Rule and subpart A. The following recommendations are based on the Forest Service's current roads policy framework and relevant legal requirements, which are described above, on the best available science, which is summarized in the attached literature review (The Wilderness Society 2014) and which the Forest Service is required to utilize under the 2012 Planning Rule, and on examples of road plan components from existing forest plans (see non-comprehensive compilation attached as Exhibit XII.6).

Moving towards an environmentally and fiscally sustainable minimum road system requires removal of unneeded roads (both system and non-system) to reduce fragmentation and the long-term ecological and maintenance costs of the system. Reconnecting islands of unroaded forest lands is one of the most effective actions land managers can take to enhance forests' ability to adapt to climate change. The Wilderness Society 2014. To that end, the revised plans should prioritize reclamation of unauthorized and unneeded roads in roadless areas (both Inventoried Roadless Areas under the 2001 Roadless Area Conservation Rule and newly inventoried areas under the Chapter 70 process), important watersheds, and other sensitive ecological and conservation areas and corridors.

In addition to creating a connected network of un-roaded and lightly-roaded lands, the plans should address roads-related impairment of watersheds, as identified by the Watershed Condition Framework roads and trails indicator and section 303(d) of the Clean Water Act, 33 U.S.C. § 1313(d). The revised plan should prioritize removal of unneeded and unauthorized roads in watersheds functioning at risk or in an impaired condition, or that contain 303(d) segments impaired by sediment or temperature associated with roads. More generally, the plan must implement national best management practices (BMPs) for water quality, 36 C.F.R. § 219.8(a)(4),[89] and plan components should integrate BMPs into management direction aimed at reducing the footprint and impacts of the forest road systems and ensure they are effective in doing so.

A sustainable road system also requires maintenance and modification of needed roads and transportation infrastructure to make them more resilient to extreme weather events and other

[89] *See also* USDA Forest Service 2012 (National Best Management Practices for Water Quality).

climate stressors. *See* Exec. Order 13653, §§ 1, 3, 5(a) (agency tasked with enhancing resilience and adaptation to climate change impacts). Plan components should direct that needed roads be upgraded to standards able to withstand more severe storms and flooding by, for example, replacing under-sized culverts and installing additional outflow structures and drivable dips. The Wilderness Society 2014; *see also* FSH 1909.12, ch. 20, § 23.23l(2)(b)(1) (plan components may include road improvement objectives for culvert replacement or road stabilization). Plan components should also prioritize decommissioning of roads that pose significant erosion hazards or are otherwise particularly vulnerable to climate change stressors, and should address barriers to fish passage. *See* FSH 1909.12, ch. 20, § 23.2l(2)(b)(1) (plan components may include decommissioning objectives).

In addition to reducing fragmentation and enhancing climate change adaptation, adoption of road density thresholds for important watersheds, migratory corridors and other critical wildlife habitat, and general forest matrix is one of the most effective strategies for achieving an ecologically sustainable road system. The Wilderness Society 2014 (pages 6-8 and Attachment 2 summarize best available science on road density thresholds for fish and wildlife). Indeed, there is a direct correlation between road density and various markers for species abundance and viability. *Id.*; *see also* FSH 1909.12, ch. 10, § 12.13 & Ex. 01 (identifying road density as one of the "key ecosystem characteristics for composition, structure, function, and connectivity" used to assess the "status of ecosystem conditions regarding ecological integrity"). Plan components should incorporate road density thresholds, based on the best available science, as a key tool in achieving a sustainable minimum road system that maintains and restores ecological integrity. *See* FSH 1909.12, ch. 20, § 23.23l(2)(a) (desired condition for road system may describe desired road density for different areas). In doing so, it is critical that the density thresholds apply to all motorized routes, including closed, non-system, and temporary roads, and motorized trails. The Wilderness Society 2014 (Attachment 2 describes proper methodology for using road density as a metric for ecological health).

A sustainable road system must also be sized and designed such that it can be adequately maintained under current fiscal limitations. *See* FSH 1909.12, ch. 20, § 23.23l(1)(c) (plan components for road system "must be within the fiscal capability of the planning unit and its partners"). Inadequate road maintenance leads to a host of environmental problems. The Wilderness Society 2014. It also increases the fiscal burden of the entire system, since it is much more expensive to fix decayed roads than maintain intact ones, and it endangers and impedes access for forest visitors and users as landslides, potholes, washouts and other failures occur. To integrate the approaches described above and satisfy the substantive mandates of the 2012 Planning Rule and subpart A, we recommend the following plan components and elements, which are supported by best available science, as the building blocks of a framework for sustainable management of forest roads and transportation infrastructure:

1. *Desired Future Condition is an appropriately sized and environmentally and fiscally sustainable minimum road system that facilitates enjoyable visitor experiences and forest programs.*

The Forest Service's current roads management policy framework is generally aimed at shrinking the agency's vast and decaying road system and its associated adverse

environmental and social impacts to create a streamlined, efficient, and sustainable system. Accordingly, the desired future condition for transportation infrastructure should include a well-maintained and appropriately sized system of needed roads that is fiscally and environmentally sustainable and provides for safe and consistent access for the utilization, administration, and protection of the forest. That forest road system is designed and maintained to withstand future storm events associated with climate change, to prioritize passenger vehicle access to major forest attractions, and to integrate with road systems on adjacent lands. The road system reflects long-term funding expectations. Unneeded roads, including system, temporary, and non-system roads, are decommissioned and reclaimed as soon as practicable to reduce environmental and fiscal costs. Reclamation efforts are prioritized in roadless and other ecologically sensitive areas to enhance ecological integrity and connectivity and to facilitate climate change adaptation. The system meets road density thresholds, based on the best available science, for all motorized routes in important watersheds and wildlife habitat, migratory corridors, and general forest matrix, and for relevant threatened and endangered species and species of conservation concern. Road construction, reconstruction, decommissioning, and maintenance activities are designed to minimize adverse environmental impacts. Passenger vehicle roads are maintained to standard to ensure reliable access to popular developed recreation sites. Best management practices are in place on all system roads, monitored regularly for effectiveness, and modified as needed based on monitoring.

2. *Objectives provide a concise, measurable, and time-specific statement of a desired rate of progress towards achieving a sustainable minimum road system.*

    a. Over the life of the plan, decommission and naturalize all unneeded roads (e.g., those identified as likely not needed for future use in the Travel Analysis Report (TAR)). Decommission at least 5% of roads identified as unneeded each year. Within 10 years of plan approval, decommission unneeded roads with the most benefit in achieving an ecologically and fiscally sustainable transportation network (e.g., roads posing a high risk to forest resources, roads in inventoried roadless areas and other ecologically sensitive areas, etc.).
    b. Over the life of the plan, implement the minimum road system (pursuant to 36 C.F.R. § 212.5(b)).
    c. Within 10 years of plan approval, address all roads within at-risk and impaired watersheds with poor or fair ratings for the Watershed Condition Framework (WCF) roads and trails indicator, and within watersheds contributing to sediment or temperature impairment under section 303(d) of the Clean Water Act.

3. *Standards ensure that roads do not impair ecological integrity and otherwise satisfy the substantive requirements of the 2012 Planning Rule and subpart A.*

    a. To ensure ecological integrity and species viability, establish density standards based on the best available science for all motorized routes:
        i. In important watersheds, wildlife habitat, migratory corridors, and general forest matrix; and

ii. For relevant species or resources present on the forest, including but not limited to threatened and endangered species and species of conservation concern.

b. Within 3 years of plan adoption, the forest shall identify its minimum road system and an implementation strategy for achieving that system that is consistent with forest plan direction and relevant regulatory requirements.
c. The forest shall identify and update as necessary its road management objectives for each system road and trail.
d. With respect to temporary roads, the forest shall:
    i. Within 5 years of plan approval, establish a publicly available system for tracking temporary roads that includes but is not limited to the following information: road location, purpose for road construction, the project-specific plan required below, year of road construction, and projected date by which the road will be decommissioned. Within 10 years of plan approval, all temporary roads will be reflected in the tracking system.
    ii. All temporary roads will be closed and rehabilitated within two years following completion of the use of the road.
    iii. Over the life of the plan, all unaddressed temporary roads will be decommissioned and naturalized.
e. All roads, including temporary roads, will comply with applicable and identified Forest Service best management practices (BMPs) for water management. Implement BMP monitoring to evaluate BMP effectiveness and identify necessary modifications to address deficiencies.
f. With respect to riparian management zones, the forest shall:
    i. Establish widths for riparian management zones around all lakes, springs, perennial and intermittent streams, and open-water wetlands.
    ii. Ensure that all management practices and project-level decisions with road-related elements in riparian management zones do not cause detrimental changes in water quality or fish habitat.
g. Watershed restoration action plans address road-related impacts identified in the TAR.

4. *Guidelines are designed to achieve a sustainable minimum road system*

    a. The forest shall make annual progress toward achieving the minimum road system and motorized route density standards.
    b. Project-level decisions with road-related elements implement TAR recommendations and advance implementation of the minimum road system and motorized route density standards.
    c. Routes (unauthorized, temporary, non-system, and system) identified for decommissioning and naturalization through the TAR or other processes will be closed, decommissioned, and reclaimed to a stable and more natural condition as soon as practicable.
    d. Prioritize road decommissioning and naturalization to enhance landscape connectivity and ecological integrity based on:

i. Effectiveness in reducing fragmentation, connecting un-roaded and lightly-roaded areas, and improving stream segments, with a focus on inventoried roadless areas, important watersheds, areas of high tree mortality,and other sensitive ecological and conservation areas and corridors;
ii. Benefit to species and habitats;
iii. Addressing impaired or at-risk watersheds;
iv. Achieving motorized route density standards;
v. Enhancement of visitor experiences; and
vi. Cost-effectiveness and feasibility, including opportunities to incorporate road decommissioning work into other forest projects.

e. Prioritize maintenance of needed routes based on:
i. Providing passenger vehicle access;
ii. Storm-proofing needs and opportunities (e.g., relocating roads away from water bodies, resizing or removing culverts, etc.);
iii. Addressing public safety concerns associated with road associated tree mortality;
iv. Restoring aquatic and terrestrial habitats and habitat connections; and
v. Increasing resilience.

5. *Monitoring program ensures progress toward Desired Future Condition using monitoring questions/indicators such as:*

a. Percentage of passenger car roads with a safety condition rating of good.
b. Percentage of unneeded road miles decommissioned and reclaimed within inventoried roadless areas or areas with identified wilderness characteristics (in FSH 1909.12, chapter 70, section 72), critical habitat, or other area with recognized conservation values.
c. Percentage of subwatersheds with an identified minimum road system.
d. Percentage of subwatersheds with an implemented minimum road system.
e. Percentage of roads addressed in subwatersheds with a "poor" WCF roads and trails indicator, and in watersheds contributing to sediment or temperature impairment under section 303(d) of the Clean Water Act.
f. Miles/percentage of roads identified as likely not needed for future use in the TAR or other processes that have been decommissioned.
g. Miles of road improved or maintained to meet BMP guidelines.

Recommendations: Consistent with subpart A and the substantive requirements of the 2012 Planning Rule, the final plans should provide a suite of plan components aimed at achieving an ecologically and fiscally sustainable transportation system over the life of the plans. Recommended plan components are included in the preceding subsection. The Forest Service also must analyze the significant ecological and fiscal impacts associated with the forest road systems in the EIS. Adequate NEPA analysis and plan direction on the road system will necessarily require a supplemental DEIS.

XIII. Pacific Crest Trail

A. Establishment of a PCT Management Area in Draft Forest Plans

We are pleased that the draft plans comply with the new U.S. Forest Service direction that requires forests to establish special management areas for National Scenic Trails.
The National Trails System Act and FSH 1909.12, chapter 20 call for managing the Pacific Crest Trail (PCT) as a single entity across administrative boundaries. "The Interdisciplinary Team shall identify Congressionally designated national scenic and historic trails and plan components must provide for the management of rights-of-ways (16 U.S.C 1246(a)(2)) consistent with applicable laws, regulations, and Executive Orders. Plan components must provide for the nature and purposes of existing national scenic and historic trails and for the potential rights-of-way of those trails designated for study." (16 U.S.C. 1244(b)). *See also* FSH 1909.12, ch. 20, § 24.43(1)(d) ("The Responsible Official shall consult with neighboring Responsible Officials when developing plan components for national scenic and historic trails that cross unit boundaries and shall strive to maintain or establish compatible management approaches while recognizing diverse resource conditions and needs in the different plan areas"). To meet these requirements, a geographic area surrounding the PCT must be established of sufficient size, and with appropriate plan components, to assure that the PCT experience, including natural, cultural, scenic and recreational values, is protected and enhanced. We believe the most effective and conservative way to delineate the area is to use the Scenery Management System's foreground corridor as a base, with a minimum corridor of 500 feet from the trail; the foreground area is all of the land that can be seen from the trail for up to one-half mile. The foreground mapping should occur from the main trail tread, associated viewpoints, water sources and camp areas and the trails connecting them to the main PCT, as chosen on a case by case basis, using importance to the PCT experience as a guide.

B. Motorized and Mechanized Use On or Along the PCT

The PCT is a primitive, non-motorized backcountry path designed for old-fashioned forms of travel: foot or horseback. Motorized use has always been prohibited on National Scenic Trails. Additionally, in 1988, the United States Forest Service issued an immediate and effective closure order that prohibited "using or possessing a bicycle except by special-use authorization" (Pursuant to 36 CFR 261.50 (a)(b)) on any portion of the Pacific Crest National Scenic Trail under Forest Service jurisdiction. We are pleased that the Sierra, Sequoia, and Inyo draft forest plans adhere to this prohibition. The problem with mechanized use along the PCT, such as bicycle use, is not only that it presents safety hazards and user conflicts, but it has the potential to change forever the trail experience that people have come to expect.

C. Scenic Integrity Objective (SIO) Within the PCT Management Area

We support the Guideline (MA-PCTW-GDL) in the Sierra, Sequoia, and Inyo draft forest plans that states "all management activities in the PCT Management Area should meet or exceed high or very high scenic integrity objectives." PCT users should feel they are traveling through an unaltered natural landscape. This also means that projects in the PCT Management Area should not cause significant impact to the surrounding scenery; or, projects must incorporate

mitigation measures that will reduce visual impacts and leave the landscape appearing unaltered and natural.

D. Scenic Integrity Objective for the PCT Viewshed

Views of Forest Service lands seen from the PCT should be managed in a manner to meet or exceed a Scenic Integrity Objective (SIO) of Moderate as seen from the PCT. PCT users should not easily notice impacts to the landscape from human activities in these more distant areas from the trail. To ensure that the long distance panoramic views seen from the PCT are protected, we propose the following additional language (*in italics*) in the Forestwide Scenery Guideline (SCEN-FW-GDL): **02** Maintain scenic integrity objectives and scenic stability levels for the Pacific Crest Trail corridor, and surrounding National Forest System lands viewsheds, for the retention of panoramic views and landscape connectivity. *Lands viewed beyond the PCT Management Area will meet an SIO of at least Moderate as seen from the PCT.*

XIV. Timber Suitability

Each draft plan contains a timber suitability appendix (Appendix E); they are, for the most part, identical. The purpose of the appendix is to establish the lands suitable for timber production and identify the projected sale quantity and projected vegetation practices. We have a number of concerns about the appendices in each draft plan.

First, there are no methods provided to support the "sustained yield limit" for each national forest. A value is reported, but the assumptions and methods used to calculate that value are not reflected in the appendix or other documents. In particular, it is important to evaluate the land base that "may be suitable for timber production" in light of the recent effects of drought and climate change projections in the near future. Periodic drought and ongoing climate change should be taken into account when estimating the "volume that could be produced in perpetuity on lands that may be suitable for timber production" (Sierra draft plan, p. 153).

Second, a very limited set of the lands were identified as "lands where management objectives limit timber harvest" (Sierra draft plan, p. 154). These include recommended wilderness areas, eligible wild and scenic river segments, and California spotted owl protected activity centers. The criteria used for designation was that timber production was not a primary or secondary objective. This ignores the remaining criteria that must be considered, which are listed in 1909.12 FSH 61.2:

1. Timber production is a desired primary or secondary use of the land.
2. Timber production is anticipated to continue after desired conditions have been achieved.
3. A flow of timber can be planned and scheduled on a reasonably predictable basis.
4. Regeneration of the stand is intended.
5. Timber production is compatible with the desired conditions or objectives for the land designed to fulfill the requirements of 36 CFR 219.8 to 219.10.

The public must be able to review how each of these factors was considered for each land allocation in the revised plan, and an explanation of why lands are suitable for growing and logging a "regulated crop of trees" must be provided if any of these criteria are not met. Based on the plan components presented in the draft plans, riparian conservation areas, critical aquatic refuges, and great gray owl protected activity centers should also be identified as “lands where management objectives limit timber harvest,” and should therefore be considered not suited for timber production. Any lands were timber production is described as a "by-product" would not meet the criteria for suitability. Neither would lands managed for adaptive management because timber harvest beyond the first would be contingent on future learning. In these plans that would include the focus landscapes.

Third, the appendices inappropriately suggest that even-aged management practices may be used as a result of site-specific analysis:

> Site-specific analysis may also lead to the use of alternative regeneration methods, including those associated with the even-aged management system. For example, project-specific objectives may lead to use of the shelterwood regeneration method to aid in establishment of seedlings

(e.g., Sierra draft plan, p. 159) The assertion that even-aged methods may be selected after site-specific analysis is incorrect and not consistent with the directives. The planning rule states:

> (4) Where plan components will allow clearcutting, seed tree cutting, shelterwood cutting, or other cuts designed to regenerate an even-aged stand of timber, **the plan must** include standards limiting the maximize size for openings that may be cut in one harvest operation, according to geographic areas, forest types, or other suitable classifications

(36 CFR 219.11 (d)(4), emphasis added) We ask that you revise this section to be consistent with the planning rule and clearly state that even-aged management such as clear cutting, shelterwood, seed tree and other even-aged practices are not consistent with these plans.

XV. Climate Change

The three forest plans fail to fully take into account climate change and will therefore fall short of the 2012 Forest Rule’s mandate to provide for ecological sustainability and ecosystem diversity, while taking into account system drivers and stressors. The three plans contain only amorphous "desired conditions" for climate change resilience, as in the following examples, which are found in all three draft forest plans:

> ***Forestwide Terrestrial Desired Conditions (TERR-FW-DC):*** **02** Vegetation conditions, particularly structure and composition, **are resilient to climate change** and to the frequency, extent and severity of ecological processes, which include fire in fire-adapted systems, drought, and flooding in riparian systems. Functioning ecosystems retain their essential components, processes and functions. Native insect and disease populations are

generally at endemic levels with occasional outbreaks. Vegetation structural diversity usually restricts the scale of insect and disease outbreaks to local levels.

Animal and Plant Species: Forestwide (SPEC-FW-DC): 01 Sustainable populations of native and desirable non-native, plant and animal species are supported by healthy ecosystems, essential ecological processes and land stewardship activities, and reflect the diversity, quantity, quality and capability of natural habitats on the forest. **These ecosystems are also resilient to** uncharacteristic fire, **climate change,** and other stressors in order to support the long-term sustainability of plant and animal communities.

Rivers and Streams (RCA-RIV-DC): 01 Stream ecosystems, riparian corridors and associated stream courses sustain ecosystem structure; are **resilient to natural disturbances (e.g., flooding) and climate change**; promote the natural movement of water, sediment and woody debris; and provide habitat for native aquatic species or desirable non-native species.

Conspicuously absent from all three plans is any articulation of how to achieve these desired conditions. There is not a single standard in any of the three plans that refers to climate change, and only one guideline, (TIMB-FW-GDL- 02), which calls for "considering" climate change adaptation in reforestation of timber lands. With respect to individual at-risk wildlife, the only species that has even a mention of climate change in plan components is Pacific fisher, and that is limited to a desired condition for tree and shrub cover in movement habitat in focus landscapes (SPEC-PF-DC-07, Sequoia and Sierra Plans).

The monitoring plans do include climate change-related questions (Table 14 in all three plans), but monitoring is insufficient in the absence of any mandatory constraints on activities in the event that monitoring finds that desired conditions for climate resilience are not being met. The overall inadequacy of the plans to provide for climate change resilience is acknowledged in the EIS: Summary Table S-2 indicates that Alternative B, as represented by the Draft Forest Plans, would result in a "Trend to slightly worse condition than present" for the key indicator of "Overall resilience to climate change to maintain or enhance watershed conditions."

The plans for the three forests should be substantially revised to include both standards and additional guidelines that direct more specific climate change adaptation strategies, such as those articulated in Kershner (2014), that enable the forests to move toward the desired conditions for their habitat types. The plans should also be updated to include desired conditions for each at-risk species, and standards and guidelines added accordingly.

XVI. Organization of the Draft Plans

We found the present organization of the draft plans confusing. We recommend that they be revised to follow the outline structure used for the draft revised plan now available for review on the Flathead National Forest. The benefits of this organization are that all the plan components are more tightly coupled to the resource areas to which they apply. This also makes clear that forestwide desired conditions have other plan components that are coupled to them.

We also think the use of "management areas" is inconsistent and needs to be clarified in the draft plans (e.g., see comments above on missing management areas). We think the distinction between "management areas" and "geographic areas" is an important one and helpful to understanding the actions allowed or planned for on the landscape. For instance, we think it important to identify "recreation places" as geographic areas since they are intended to convey the character of an area and the recreational services these areas would provide.

We also find that the identification of suitable uses is not clear. We expect that unless a use is unidentified as not suitable, it is suitable. This approach can lead one to wonder if the suitability of a use was just not considered in a given management or geographic area, or if its omission is intentional. We ask that you include a suitability of uses table similar to the one provided in the Lake Tahoe Basin Unit plan (USDA Forest Service 2016c, Table 4, p. 98). This table helps to clarify common uses, suitability, and when needed the context for their suitability. Inclusion of such a table would improve the clarity of the draft plans.

Lastly, we find the use of the term "potential management approaches" confusing. These statements are considered other plan content and are not a plan component. As such, they cannot be used to establish that the forest plan has met the requirements for sustainability, plant and animal diversity, multiple use, and timber as directed by the planning rule (36 C.F.R. 219.7). Nonetheless, the draft plans appear to elevate "potential management approaches" to the level of a plan component in their presentation in the draft plans and their application to the analysis in the DEIS (see comments above on their use as assumptions in the DEIS). This confuses anyone attempting to understand the uses allowed by the forest plan. Also, the term "management approach" is not properly distinguished from "proposed and possible actions" which are other content that must be included in the plan (36 C.F.R. 219.7). We note that "proposed and possible actions" are included in an appendix that clearly notes the context for these actions; we find this clear and helpful to understanding the intent of the plans. We ask that the role of "potential management strategies" be clarified in the draft plans and that its relationship to "proposed and possible actions" be addressed.

Lastly, we thought it helpful to have the definitions of the plan components in each draft plan (e.g., Sierra draft pan, p. 7). They provide a context for their application and help any reader understand how the plan functions. We ask that you provide, in this same section of each forest plan, definitions of the other plan component, i.e., goals, and other plan content. This section should also address how a project would be judged to be consistent or not with the forest plan. We refer you to the presentation of this information in the draft forest plan now out for review for Flathead National Forest (USDA Forest Service 2016d) as an example that we thought useful.

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XVIII. Attachments

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Exhibit IV.1	Canopy Cover, and high severity-large Fires in Sierra Nevada 2008 to 2015
Exhibit IV.2	Dr. Reginald H. Barrett critique of DEIS and draft plans 8-6-16
Exhibit VII.1	The Wilderness Society, Achieving Compliance with the Executive Order "Minimization Criteria" for Off-Road Vehicle Use on Federal Public Lands: Background, Case Studies, and Recommendations (May 2016
Exhibit VII.2	Winter Wildlands Alliance, Winter Recreation on National Forest Lands: A Comprehensive Analysis of Motorized and Non-Motorized Opportunity and Access (2015), available at http://winterwildlands.org/wp-content/uploads/2015/06/2015-Winter-Rec-Report.pdf
Exhibit VIII.1	Comments on DEIS Volume 2, Appendix C: Wild and Scenic Rivers Evaluation for the Inyo, Sequoia, and Sierra National Forests
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Exhibit IX.7:	The Wilderness Society & California Wilderness Coalition, Recommendations for management of roadless areas in the Sequoia National Forest (Nov. 17, 2014)
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Exhibit XI.1:	The Wilderness Society et al., Consideration of Special Designations in Plan Revisions for Sierra, Sequoia, and Inyo National Forests (Nov. 18, 2014)
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Map XII.A:	Watershed Condition Framework, Roads & Trails Indicator, Sierra, Sequoia, and Inyo National Forests
Exhibit XII.2:	Memorandum from Joel Holtrop to Regional Foresters et al. re Travel Management, Implementation of 36 C.F.R., Part 212, Subpart A (Nov. 10, 2010)
Exhibit XII.3:	Memorandum from Leslie Weldon to Regional Foresters et al. re Travel Management, Implementation of 36 C.F.R., Part 212, Subpart A (Mar. 29, 2012)
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