June 30, 2014

Mike Dietle
Land Management Plan Revision
USDA Forest Service
Ecosystem Planning Staff
1323 Club Drive
Vallejo, CA 94592

Sent to: R5planrevision@fs.fed.us

Re: Comments on Need for Change Analysis, Desired Conditions, and Wilderness Inventory

Dear Mr. Dietle:

These comments are submitted on behalf of Sierra Forest Legacy and eight conservation organizations. We appreciate the opportunity to comment on the revised need for change documents, draft desired conditions, and preliminary wilderness inventory. We view the Need for Change documents as foundational to the revision process for the Inyo, Sierra and Sequoia national forests and the first opportunity for dialogue on the specific areas where the current plans need to change to address trends and conditions. We want to recognize your Team's effort to provide more detail and clarity about their views on the aspects of the forest plans that they believe need to change and appreciate being able to review their supporting analysis.

The comments below principally address two documents: 1) Inyo, Sierra, and Sequoia National forests Need to Change Analysis (NTCA); and 2) Inyo, Sequoia, and Sierra National Forests Need to Change Analysis – Supplement (NTCA – Supplement). We refer below collectively to these documents as "NTC documents." For two topics areas, Special Designations and Infrastructure, we also comment on the Draft Desired Conditions document. It is our intention to provide additional comment on the Draft Desired Conditions document during the week of July 7. In addition, we provide comments on the Wilderness Inventory and Evaluation process paper (see Section XVI).

I. Overview

For many of the topics and subtopics in the NTCA – Supplement document, we are in agreement with you about the topics that need to change in the forest plans. For several of these topics areas where we are in agreement about the need to change, we are not always in agreement with you about the stressors acting on the resource, the limitations provided by the forest plans, or the components of the plan that should be revised. In our comments below, we provide detailed responses for several resource areas.

As a general matter, all of the stressors acting on each resource that necessitate the need to change have not been clearly defined. Without clear definitions the rationale for the "relationships between current plan direction and resource condition", the "change recommended" (i.e., need to change), and the "rationale for recommendation" lack clarity and are ambiguous. To address this, we suggest a column be added to the table in the supplement that clearly defines all of the important stressors acting on each resource which necessitate a need to change.

For several resource areas, we disagree with your assessment that the forest plan does not need to change. They include (listed in the order in which they appear in the NTCS): 1) conservation of birds associated with meadows and riparian areas; 2) connectivity of aquatic and riparian ecosystems; 3) water and watersheds; 4) timber; 5) energy and minerals; 6) facilities and transportation system; 7) public utilities; and 8) other designated areas. We provide comments on these areas in detail below.

These comments generally follow the outline structure of the NTCA with additional detail (headings) provided by the NTCA - Supplement. The comments below also include specific reference to eastside ecosystems or the Inyo National Forest in cases where our feedback on those areas is unique to that national forest or type.

II. Plan-wide

The NTCA identifies two aspects of change related to outreach to underrepresented populations and partnerships with tribes. We ask that you add a third item to this section focused on partnerships with other agencies and stakeholders. Strategies that focus on developing partnerships with a variety of organizations will be essential to completing the restoration work alluded to in the NTC documents and should be called out in the forest plan.

III. Ecological Integrity of Terrestrial Ecosystems

A. Fire as an Ecological Process

The NTCA – Supplement emphasizes a concern about large, intense, and uncharacteristic wildfires. The persistent focus on uncharacteristic fire highlights its function as a stressor and deemphasizes fire as a beneficial and essential driver for many ecosystems that are discussed. While the NTCA- Supplement accurately points out the deficit of low and moderate severity fire in the system, it fails to describe the entire fire story. The Sierra Nevada is also experiencing a deficit of high severity fire at the appropriate scales. As suggested in the Old Forest and Early

Complex Seral Habitat section of the NTCA - Supplement, the lack fire disturbance is creating a decline in this important habitat across the early adopter forests. Low and moderate intensity fire is desired and at the appropriate scales high intensity fire is also desired.

The NTCA - Supplement does not address the current backlog of prescribed fire acres or the acres that simply cannot be treated due to inaccessibility. Researchers from Pacific Southwest Research Station and UC Berkeley have assessed the Sierra Nevada Bioregion for constraints to mechanical treatments in productive forests based on legal, operational, and administrative constraints. For the Sierra 74% of the forest is unavailable for mechanical treatment, for the Sequoia 71% of the forest is unavailable for mechanical treatment, and for the Inyo 76% of the forest is unavailable for mechanical treatment. In these areas, the only tool for active management is some type of fire. This signifies the enormity of restoring fire as an ecological process and the need for discussion in the need to change on the lack of fire use, i.e., the use of both planned and unplanned ignitions, to address fire deficits.

The trend of condition section is missing key trends that are limiting fire restoration, including: 1) lack of support and incentive to accomplish burn acres; 2) lack of dedicated burn crews (crews are more suppression oriented than fire use); and 3) the need to get approval from the Region in order to move forward with any managed natural ignition (local and intimate knowledge is not always considered when it is required that the Region approve all managed natural ignitions. Please include the above in the analysis since they are contributing to the decline of restoration of fire as an ecological process.

B. Eastside Terrestrial systems

We appreciate your acknowledgment of the challenge of cheatgrass invasion on the eastside, and building new science and adaptive management strategies into plan components. Additionally, we appreciate the additions of Desired Conditions and plan components for ecological integrity of eastside ecosystems. Please name and define these ecosystems and eastside communities using the Forest Assessment. Please also include Canyon Live Oak/Black Oak, found in small patches along the southern Sierra Escarpment.

1. Subalpine and Alpine (Eastside)

These communities are extremely fragile on the eastside and are among the most loved places, receiving heavy use with lasting impacts. This damage is exacerbated because there is no Forest Service presence in these areas. Although the NTCA acknowledges concentrated recreational use in these areas, recreational monitoring is absent and visitor use data is inaccurate (also see our comments in the Wilderness section of this letter). Additionally, subalpine and alpine meadows need a separate discussion in this section. Finally, this section is also lacking a discussion of Whitebark Pine stands on the eastside. This community is under threat from Mountain Pine Beetle infestation. Several areas of the forest are undergoing an age class conversion as the beetles target older trees and thrive from a warming climate. Plan components need to include careful management of Whitebark stands that prohibit logging and aerial herbicide spraying management methods. Adaptive management, collaborative work with other Forests, new science and monitoring will all be essential to the ecological integrity of Whitebark Pine habitats.

2. Old Forest and Complex Early Seral Habitats (Eastside)

We support the addition of desired conditions for post-fire monitoring. Updating desired conditions to address old forest components and function is a good start, but addressing all seral stages is equally important. Fundamentally, this section needs to be separated into westside and eastside subsections in order to appropriately cover Great Basin habitats found on the Inyo (i.e. dry forb meadows, sagebrush, pinyon-juniper woodland). Many of these habitats need active management and in many cases the current forest plans do not provide the direction needed to support restoration.

3. Meadows and Fens (Eastside)

Meadows are described in detail in the forest assessment. Meadows play an important role in water distribution, storage and filtration in the Sierra Nevada. Meadows health is declining on the eastside due to a variety of factors including drought, grazing regimes, invasive species, incision, water withdrawal and fire suppression. Aspen groves within meadows have declined significantly for similar reasons, in addition to conifer encroachment. The successful restoration of forest service meadows will only occur through a collaborative approach that has a scientifically backed monitoring foundation. There is a need to change grazing management to support functioning meadows (timing of year and length of grazing time are key factors). Meadows contribute to ecological resilience to climate change through storage and slow releases of cool water discharges through dry periods.

C. Westside Terrestrial Ecosystems

1. Foothill

The trends and conditions of the foothill zone list several reasons decline; however, there are two key reason not listed in the table. We ask that you include fire suppression and lack of a robust fire management program as contributing to a decline in the foothill zone. Additionally, the NTCA- Supplement states that, "National fire policy has changed since the plans and emphasizes management of **fire** for resource benefit and protection, recognizing that it is one of the most efficient means to reduce fire hazard while at the same time using a risk management approach to minimize loss of human life and values," (emphasis added). From this, it is clear that an emphasis on the use of managed fire as a cost-effective fuels reduction tool should be included in the new plans.

2. Montane (pine, oak, mixed conifer)

According to the NTCA - Supplement, "Some plan direction limits pace and scale of vegetation restoration, by both mechanical means and fire." Please define how current plan direction limits pace and scale so that it is clear how and why new plan components will allow for increases in pace and scale.

The NTCA - Supplement states that, "National fire policy has changed since the plans and emphasizes management of **fire** for resource benefit and protection, recognizing that it is one of

the most efficient means to reduce fire hazard while at the same time using a risk management approach to minimize loss of human life and values," (emphasis added). From this, it is clear that an emphasis on the use of managed fire as a cost-effective fuels reduction tool should be included in the new plans. Based on recent Forest Service projects that propose salvage logging thousands of acres of forest, including green trees, that burned at low and very low severity (e.g., the Aspen Fire), specific plan components (objectives, standards, and guidelines) are necessary to define if, how, when, and why management should occur within each burn severity class and burn patch size classes to ensure the ecological benefits (i.e., heterogeneity and increased habitat quality for old forest species) are maintained.

3. Old Forests and Dense Canopy cover

The NTCA - Supplement indicates that current "plan direction for old forest emphasizes closed canopied conditions that contribute to reduced fire resilience and are inconsistent with new science on forest heterogeneity." It is not clear what science this statement is referring to that indicates that closed canopies contribute to reduced fire resilience and lack of heterogeneity, as we find no mention of this in the Science Synthesis, Bioregional Assessment, or the forest-specific assessments, for which the need to change is supposedly based. The NTCA – Supplement states that a need to change is necessary to, "Incorporate updated science (e.g., PSW GTR 220/237) into management direction to better facilitate restoration. Our review of GTR 220 and 237 found no mention of data supporting the idea that closed canopied forests were less resilient to fire or lack heterogeneity. On the contrary, as cited in GTR 220 (North et al. 2009), "Studies and models suggest a crown fire entering a stand is rarely sustained (i.e., sustained only under extreme weather conditions) if understory fuels are too sparse to generate sufficient radiant and convective heat (Agee and Skinner 2005, Stephens and Moghaddas 2005). North et al. (2009) go on to state that:

> …in forests adjacent to homes or key strategic points, managers may want to reduce canopy bulk density to reduce potential fire severity under all possible weather scenarios. Outside of those cases, the value of crown separation in preventing crown fire spread may be limited (Agee et al. 2000, Stephens and Moghaddas 2005). 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. These may include additional fuel reduction such as thinning canopy bulk density in strategic locations.

(North et al. 2009) According to the Science Synthesis, "in field-based experiments, Stephens and Moghaddas (2005b), Schmidt et al. (2008), and Stephens et al. (2009) all found that prescribed fire alone effectively reduces surface fuels, thus reducing modeled spread rates, fire line intensities, and flame lengths under a range of weather conditions. In addition, these studies also demonstrate substantial reductions in ladder fuels in areas treated with prescribed fire. It is worth noting there are instances in which extreme fire behavior (e.g., plume collapse, extreme wind) can overwhelm even well-designed fuel treatments, and lead to high tree mortality (Finney et al. 2003, Werth et al. 2011)."

We also found no mention of data in the Science Synthesis supporting the idea that it is necessary to reduce canopy cover to increase resilience to wildfire. In fact, GTR-220 (North et al. 2009, p 29) cautions to "limit use of crown separation in fuels treatments."

Finally, GTR 237 (North 2012), in reference to increasing heterogeneity through gap creation and the potential conflict this may have with standards and guides in the SNFPA, states:

> The standards and guides in the 2004 Sierra Nevada Framework (SNFPA 2004) have specific minimum canopy cover targets designed to provide suitable habitat for sensitive species such as the California spotted owl. Some managers concerned that canopy cover would fall below levels in the standards and guides have been hesitant to create gaps in treated stands. Creating a gap will lower canopy closure (a point measure) over the opening, but may not significantly lower canopy cover (a stand-level average). Canopy closure should be distinguished from canopy cover to accurately assess forest canopy conditions and characteristics that matter to key wildlife species. This distinction is particularly important because, following GTR 220 concepts, treatments are intended to produce tree groups, gaps, and areas with a low density of large trees."

(Ibid.) North et al. (2009, p. 32) is clear that about balancing forest canopy requirements with other restoration concerns stating that forest tree size and density, post-treatment, should not be significantly lower than what occurs in a female (fisher) home range. This information indicates that maintaining higher levels of canopy cover to provide habitat for old forest species does not conflict with creating heterogeneity at the stand or landscape scale or the guidance provided in GTR 220/237.

It is troubling that a driving tenant of the NTC documents for the old forest habitat plan components is not supported by the Science Synthesis, Bioregional Assessment, the forest-specific assessments, or GTR 220/237. It appears the idea that high canopy cover is driving reduced fire resilience and lack of heterogeneity has been carried over to and is a foundation of the draft desired conditions for forested ecosystems. Prior to the development of desired conditions founded on the idea that forest restoration, fire resilience, and heterogeneity require reductions in canopy cover, it must first be demonstrated that such a strategy is supported by science, that there are not alternative scientific views that merit consideration, why the specific strategy was chosen, and that the chosen strategy does not conflict with the condition or trend of other resources (e.g., At-Risk Species).

4. Complex Early Seral Habitats (CESH)

This habitat type is addressed in combination with Old Forests in both the NTC documents. We agree that these two types reflect different stages of forest or plant community development, but we believe they should be addressed separately. Also, the NTC documents should identify that current salvage logging and reforestation practices contribute to the degradation and loss of CESH.

It appears from the NTCA – Supplement that the only changes to the forest plan proposed for CESH are focused on desired conditions. Based on our recent experiences reviewing the salvage logging and reforestation projects for the Rim and Aspen fires, we believe that the forest plan

would benefit from additional plan components, including objectives, standards and guidelines, that address salvage logging and reforestation practices. Among other things, the forest plans need to address the appropriateness of salvage logging and reforestation for those fires for which the effects fall within desired conditions. The current drive to remove the ecological benefit of burned trees and to impede the development of CESH by intensive post-fire intensive planting and herbicide use needs to be addressed in the forest plan. These actions are in direct conflict with the development of this important ecological condition. Further, the believe that such "acceleration" of tree growth is necessary to meet the desired condition to develop large trees in other seral stages needs to be informed by the science of the development and value of CESH and its contribution to ecological integrity. Ecological integrity is the foundation of the 2012 Forest Planning Rule 36 CFR § 219.9 and applies to all stages of forest development.

IV. Landscape and Habitat Connectivity

We strongly support the need to include plan direction specific to connectivity. However, the NTCA – Supplement only identifies large-scale fires as a factor that results in fragmentation of terrestrial species habitat, and does not define any other factors that result in habitat fragmentation or how large scale fire fragments habitat and for which species. Without defining all of the factors that affect habitat connectivity it is not possible to develop plan components to address barriers to movement and occupation of habitat.

There are many significant factors that contribute to habitat fragmentation that must be acknowledged and addressed in the NTC documents, including salvage logging, fuels treatments, plantations, forest management activities on private lands within and adjacent to National Forest, roads, developed facilities, and reservoirs. Factors causing fragmentation are often habitat and species specific. Not all species are affected similarly or equally by large-scale fire. The effects of large-scale fire will depend on patch sizes of burn severity and their spatial distribution across the landscape. While it is not explicitly stated, we caution citing large-scale fire, in the absence of salvage logging, as a factor affecting connectivity for old forest-associated species as there is significant evidence that burned forest of all severities continues to provide habitat for fishers, spotted owls, and goshawks. In addition to defining species-specific factors that reduce connectivity, an evaluation of the effects of forest management activities on habitat connectivity requires defining areas where bottlenecks occur.

The results from travel analysis (Subpart A) and a representation analysis ecological types of special designations (see for example discussion under wilderness evaluation comments below) are important information sources to support the development of plan components to address habitat connectivity. We ask that you integrate results from these ongoing and proposed analyses into the plan development process.

V. Ecological Integrity of Aquatic and Riparian Ecosystems

The impacts of past and current livestock grazing need to be clearly addressed in the need for change. Our review of the NTC documents indicates that in most cases, the impacts of grazing are downplayed or statements about grazing as a stressor are avoided. We agree that a multi-resource, integrated approach is more likely to provide for the ecological integrity of these highly sensitive and important ecosystems. However, failing to identify the relevant stressors, such as

current grazing practices, will result in impacts from livestock grazing not being evaluated and addressed in the planning process. Impacts to habitat for willow flycatcher, great grey owl, and Yosemite toad, mountain and Sierra Nevada mountain yellow-legged frog, several fish species, aquatic macro invertebrates, and aspen continue to occur due to the lack of plan components that support ecological integrity. Over-reliance on simple utilization standards for "forage" rather than specific plan components that drive improvements for aquatic and riparian habitats need to change.

We are also concerned that roads and trails were not specifically identified as adversely impacting meadow or riparian systems. We know from recent litigation on the Eldorado National Forests that roads adversely impact meadows systems and have disrupted the hydrological connection of the meadow. These stressors need to be identified now so that plan components can be designed to alleviate their effect.

VI. Water and Watersheds

We raised in our comments on the forest assessments that water quality related to contamination by livestock remains a serious concern. Recent research establishes that violations have occurred in areas where cattle stand and move through stream habitats (Meyers and Whited 2012). The NTC documents need to include this as a factor affecting the downward trend in water quality. Since there are no best management practices that address this issue, it is essential that the forest plan do so.

Off-highway vehicles also affect water quality when trails and roads are not properly designated and managed. Best management practices (BMPs) as currently presented address practices related to the creation of new trails and roads, but they do not address the requirements for ongoing management or the remediation of chronic problems. The forest plan is the appropriate guidance document in which to establish the expectations for road management related to water quality, especially since other guidance, e.g., BMPs, fail to address ongoing problems.

Climate driven impacts to water quality should be more fully addressed with plan components that address inappropriate or illegal water diversions, and water pollution from mining, grazing and commercial cannabis farming that risk public health and other resources, to a greater extent in low water years.

The possibility of removing small dams and other obstructions to flows in Sierra Nevada streams and rivers should be considered in the NFCA. Many old hydro-electric facilities will be outdated and filled with sediment by the time of the next revision. The Forest Service should anticipate this and develop plan components to address restoration at this scale if the opportunity occurs.

The Planning Rule identifies priority watersheds for restoration but we are concerned that plan components be developed that identify restoration for all watersheds over threshold and maintain a clearer nexus between ongoing and planned actives and the impacts to water quality and quantity. There should be increased public awareness and engagement in the restoration of damaged watersheds. Given climate change and potential for much longer dry periods, plan components (social outreach components) should be developed to provide deeper public engagement in the protection and restoration of their watersheds.

A. Inyo National Forest

Plan components need to simultaneously correct water quality issues and maintain areas with high water quality identified through monitoring. Implementation of water quality monitoring is often made possible through citizen science partnerships and taking advantage of data collected by programs of the State Water Resources Control Board. Monitoring components should include defining ecological indices for condition assessments as well as chemical standards. Several creeks and streams on the Inyo National Forest that are functioning at-risk are located in wilderness and roadless areas. We need to identify why these headwater areas are at-risk and the causes. There are likely a number of approaches to reversing water quality issues in these areas, including increased USFS presence at high visitor use, educational programs and limiting use in some areas.

The 13 watersheds identified as Functioning at Risk on the Inyo National Forest require site-specific management, including post-restoration monitoring so we know if restoration actions are actually working. Cost effective partnerships will increase the likelihood of implementation and follow through. From an economic perspective, Mammoth Creek and the South Fork of the Kern River have fisheries to sustain. Meadows need a mention in this section as well. Thank you for addressing water shortage and drought conditions. This will need specific attention in the plan. This section may benefit from a westside/eastside split to highlight the ecological differences in water resources.

VII. Air

We appreciate your inclusion of the smoke tradeoff analysis but it needs to be expanded to include educating the public about fire on the landscape and its importance. The NTC documents establish a need to focus on increasing pace and scale yet offer limited discussion on trade-offs to managing fire or suppressing fire. The focus of the analysis is on uncharacteristic wildfires, which produce uncharacteristic and long duration smoke events. The inclusion of the need to change this current dynamic and to shift focus to the trade-offs of short duration and long duration fire events will help to inform the public on the necessity of managing fire on our terms. There is much misinformation about air quality and wildfire throughout the region. The importance of using planned and unplanned ignitions to improve resource conditions at the landscape scale to safeguard communities and habitats from uncharacteristic wildfire events needs to be part of Public Information procedures. It is critical that the NFC documents support ecological integrity and the primary disturbance process that delivers it. Based on (Stephens et al. 2007) and the characterization of pre-historic fire and emissions in California, the Forest Service cannot successfully define desired conditions for forests based on the natural range of variability (NRV) while avoiding the NRV for fire and accompanying emissions which delivered resilient forests.

The resource condition for particulate matter is suggested to be poor across all three National Forests. This is an oversimplification of the issue for fire and particulate matter. This may be true for lower elevation areas but may not necessarily be the case for elevations above 500 m. New research in review by Atmospheric Pollution Research (Cisneros et al. 2014, in press) has been looking at non-attainment for $PM_{2.5}$ in the southern Sierra Nevada. The results indicate that above 500 m sites monitored for $PM_{2.5}$ were within federal standards. This study also found that

particulates varied by elevations and the time of year. Please incorporate this information into the NTC analysis.

VIII. Soils

We are concerned that legacy compaction and legacy road problems are not being addressed in project planning. Plan components should be developed that support full mitigation of legacy compaction and road issues during project planning.

IX. Drivers and Stressors

A. Invasive Species in Eastside Ecosystems

Thank you for incorporating language on cheatgrass and making sure eastside-specific invasives get attention in the 3-forest EIS. Given the depth and breadth of the problem, the Inyo NF should create a cheatgrass management plan. Strong plan components will include post-treatment plans and post-project monitoring. Cheatgrass invades disturbed areas, so all project work done, particularly when looking at restoration activities, mechanical treatment, logging, road construction, livestock grazing, and other development, should have post-project management strategies. Developing cost-recovery strategies will allow the proponent of the project to be responsible for the cost of post-project invasive species management**.**

B. Fire

The NTCA – Supplement for trend states, "Declining, due to continued accumulation of fuels, increased human ignitions, and climate change." There are additional reasons that this trend is declining, including: 1) aggressive fire suppression; and 2) lack of robust fire management programs to support an increase in the management of planning and unplanned ignitions across the Region. Please include these in the NTCA – Supplement. It is further stated, "Federal Wildland Fire Policy and the National Cohesive Fire Management Strategy compel us to restore and maintain fire-resilient landscapes…." Both policies have created a high degree of flexibility for moving towards a desired condition where ecosystems are resilient to the stressors of fire. However, current direction in the Interagency Standards for Fire and Fire Aviation (2014) limits the use of unplanned ignitions to only "naturally ignited fires" allowable for resource management. Current policy does allow for more flexibility in managing fire for a variety of objectives, yet there are still limitations in place that promote aggressive suppression tactics which in turn result in increases in fuel accumulations.

The National Cohesive Strategy recognizes that individual homeowner action for wildfire preparedness is important. Even more critical to community fire resilience is combining landscape treatments with community treatments to reduce fire risk. There is no clear link in the NTC analysis for the importance of community level action for reducing fire risks. Focus remains on fuels treatments as the primary tool to mitigate for the stressors of fire. There should be a detailed discussion in the NTC for more active engagement by the forests in promoting homeowner and community based actions for fire safety in addition to strategic fuels treatments on forestlands as outlined the National Cohesive Strategy and the Region 5 Fuels Management Strategy.

Lastly, climate and fire research, for example Stephens et al. (2014), and recent fires such as the Rim Fire are clearly providing "signals" that "mega-fires" are part of our future. Stephens et al.'s recent "mega-fire" paper suggests that fire and forest managers "should develop strategies to reduce their undesired impacts." Planning for large fires that cannot be easily controlled should be part of the NFCA.

C. Climate change

Climate change is a stressor that affects all resource areas. We expect that changing climate along with the expected inter-annual and annual variability in the climate of the Sierra Nevada to result in significant changes to landscape condition. Because of its region wide effect, we ask that you be more comprehensive in the enumeration of habitats that may be impacted by climate change with additional detail about the nature of the impact. For example, bioclimatic envelop shifts for specific vegetation types (eastside or westside of the Sierra Nevada) should be considered in all restoration and reforestation decisions. Areas of refugia and areas of likely change by (2040) where identified by the Remote Sensing Lab (USDA Forest Service) and the Regional Ecology Program (USDA Forest Service) for the Rim Fire landscape. These mapping efforts provide the best available science information to predict where restoration efforts to protect existing vegetation characteristics are useful and where it may not be appropriate given likely vegetation shifts, increased fire frequency and fire intensity.

We found that when the NTCA – Supplement addressed climate driven resource concerns, e.g., fire, invasive species, encroachment, sometimes climate change was explicitly linked to the potential for worsening the issue and other times not. In addition, in cases the habitat type discussed as being susceptible to climate change the NTCA – Supplement does not clearly identify how or why there is susceptibility. For example, this indicates that aspen is susceptible to climate change, but there is no indication or detail about how it is susceptible. This type of information is needed to evaluate specifically how the forest plan should change to address susceptibility to climate change.

As we examined the desired conditions for certain habitat types, we could see that there were gaps between the NTC documents and the desired conditions (DC). For example:

> The need for resilience to climate change is listed in DC for Sagebrush. However, it is not mentioned in the NTC rationale, even though all the factors that they list (i.e., invasive species, conifer encroachment, altered fire regime) respond strongly to changes in climate.
>
> For pinyon-juniper, the DC also envisions this forest type as resilient to climate change, but NTCA – Supplement lists several climate-linked issues without expressly mentioning climate change.

We ask that you establish a clearer and more consistent connection between NTC documents and the DC with respect to resource conditions that are strongly affected by climate.

We are also uncertain to what extent the results from the climate vulnerability assessment and adaptive strategy (CVAAS) workshops[1] were incorporated into the NTC or desired conditions. The results documented a variety of threats to specific habitat types that should be incorporated into this NTC analysis.

X. At-Risk Species

The NTCA – Supplement indicates that the current condition of most of the at-risk species is either poor or moderate with a declining trend, yet the stressors to each at-risk-species and how current plan components affect the condition or trend have not been clearly defined. Without clearly defining all of the stressors to the at risk-species and how and why current plan components affect the current condition or trend and necessitate a need to change, it will extremely difficult to develop desired conditions that adequately provide the ecological conditions necessary to maintain viable populations of each species of conservation concern in the plan area at the ecosystem level, let alone determine if additional plan components are necessary for individual species. Please provide additional information about the cause-effect relationship between components in the existing forest plan and trends and conditions for at-risk species.

We are very concerned that the habitat types that support at-risk species are considered separately from the species themselves. For instance, it would have been more informative to identify for each ecological type the at-risk species associated with those types. This would be one way of demonstrating the link between ecological type and at-risk species. This type of information becomes the foundation for assessing if plan components for a specific ecosystem type, e.g., montane, provide the habitat requisites for species such as California spotted owl or fisher. We have asked that information be organized in this fashion at all steps in the revision process, yet this essential step of integration of information still has not occurred.

We also ask that you identify now the process, including evaluation criteria, that you plan to use to assess the ability of broad scale plan components to meet the needs of at-risk species. We also ask that you provide a timeline for how this "iterative process" (as it has been called in conversations with members of the Regional Planning Team) will interface with the timeline for developing the components for the draft plan and any alternatives and the NEPA process for the evaluation of the proposed plan and alternatives.

In 2012, we developed a conservation strategy (Britting et al. 2012) to inform the forest plan revision process in the Sierra Nevada. The strategy addresses a variety of topic areas, including at-risk species. In Appendix A of the strategy, we provide species accounts and conservation recommendations for ten species of amphibians, mammals and birds considered at-risk in the Southern Sierra Nevada. Below we discuss several of these species and refer you to Britting et al. (2012) for a full discussion of these species and issues relevant to the forest plan revision.

[1] http://ecoadapt.org/workshops/sierra-nevada-va-workshop

A. Eastside Ecosystems

The Inyo has 92 species at risk. The revised plan needs to outline how the forest will identify threats and reverse species declines by addressing these threats. Although owls, fishers and listed amphibians need direct attention in plan components, other species need strong protections written into plan revisions. One method for accomplishing this is by shifting management to communities of species. These are assemblages of plants and animals linked to a particular habitat. This methodology allows for recovery of at-risk species while also keeping common species common.

1. Bi-state Sage Grouse

Please add the DPS of the Bi-state Sage Grouse in this section. The plan should use the 2012 Bi-State Action Plan[2] as a guiding document for improving ecological conditions for Sage Grouse. In addition, the Bi-State Sage Grouse DEIS (USDA Forest Service 2013) for the Humboldt-Toiyabe National Forest (HTNF) contains recommendations for managing the Bi-State Distinct Population Segment (DPS). While the DEIS is not a finalized document, it contains recommendations for managing Bi-State Sage Grouse populations and habitat in the Desired Conditions Table of the DEIS (USDA Forest Service 2013, Table 1, p. 11). Lee Ann Murphy, Inyo NF Wildlife Biologist mentioned that the Inyo National Forest (INF) is planning to adopt management direction for bi-state sage grouse that stems from the current forest plan amendment process on the HTNF (Murphy pers. comm., 6-19-14, Bishop, CA). This information should be noted in the NTC documents.

In addition, neither the current INF Sage-Grouse Interim Management Policy (USDA Forest Service 2012) nor the HTNF Bi-State Forest Plan Amendment DEIS address specific concerns regarding Sage Grouse hen pre-incubation nutrition and the need for enhancing forb abundance and diversity (Greg et al. 2008), re-nesting success and protein levels and the need to enhance forbs and grasses (Gregg et al. 2006), increased levels of shrub cover related to nesting success (Connelly et al. 2000, Kolada et al. 2009a and b, Coates and Delehanty 2010) and chick nutrition. All of these issues are related to the indirect impacts from livestock grazing on Bi-State Sage Grouse on the INF. Managing population survival levels of ≥2.25 juvenile/hen fall survival rates are likely lead to a stable or increasing population (Connelly et al. 2000) and should also be address in the revised forest plan. This is also a key trigger for forest plan monitoring for this federally designated species. Finally, the desired conditions in the HTNF Bi-State Forest Plan Amendment DEIS (USDA Forest Service 2013) largely rely on percent cover and not cover height for nesting habitat descriptions, despite the research findings that cover height is the critical metric (Connelly et al. 2000; Kolada et al. 2009a and b). Even when the HTNF amendment DEIS (p.11) calls out cover height, its application is not consistent with the references above. The forest plan revision process for the INF needs to use this information to develop plan components, including standards and guidelines, to address grazing (and other) impacts to nutrition and cover requirement for bi-state sage grouse.

[2] Available at: http://www.ndow.org/uploadedFiles/ndoworg/Content/public_documents/Nevada_Wildlife/Bi-State%20Action%20Plan.pdf

2. Bighorn Sheep

This section also needs to include plan components for management objectives under the Bighorn Sheep Recovery Plan.[3] Again, partnerships and citizen science based programs should be utilized to increase Forest Service capacity to monitor Protected Activity Areas and other areas of critical habitat. Fisheries are an integral part of the eastside economy and the bulk of recreational fishing occurs on Forest Service land. Please prioritize the responsible management of fisheries to support other native species, such as frogs and toads. This includes restoring native fish populations where appropriate.

B. Fish, Amphibians, Reptiles

The NTCA – Supplement determined a change is recommended for fish, amphibians, and reptiles based on the lack of pace and scale of fuels treatments in riparian areas and restrictions of current standards and guidelines to conduct fuels treatment work in riparian areas. However, for several of the at-risk-species, including mountain yellow-legged frog and Yosemite toad, lack of pace and scale of fuels treatments in riparian areas is not a primary stressor and it is unclear how and why it was determined that lack of pace and scale of fuels treatments in riparian areas came to dominate the need to change for these resources.

In the final rule listing the mountain yellow-legged frog complex as endangered, the U.S. Fish and Wildlife Service identified the following habitat-related activities as potentially relevant to the conservation status of the mountain yellow-legged frog complex, "fish introductions, dams and water diversions, livestock grazing, timber management, road construction and maintenance, packstock use, recreational activities, and fire management activities." In reference to the Yosemite toad, the final rule listing the species as threatened states, "Because Yosemite toads rely on very shallow, ephemeral water, they may be sensitive to even minor changes in their habitat, particularly to hydrology (Brown 2013, unpaginated). Meadow habitat quality in the Western United States, and specifically the Sierra Nevada, has been degraded by past activities, such as overgrazing, tree encroachment, fire suppression, and road building, over the last century (Stillwater Sciences 2008, pp. 1–53; Halpern *et al.* 2010, pp. 717–732; Vale 1987, pp. 1–18; Ratliff 1985, pp. *i*–48). These past activities have contributed to erosion and stream incision in areas of the Sierra Nevada, leading to meadow dewatering and encroachment by invasive vegetation (Menke *et al.* 1996, pp. 25–28; Lindquist and Wilcox 2000, p. 2). Many meadows now have downcut stream courses, compacted soils, altered plant community compositions, and diminished wildlife and aquatic habitats (SNEP 1996, pp. 120–121)." From this, it is clear there are numerous significant stressors affecting these species, of which the lack of resilience of riparian areas to wildfire is at most a moderate stressor; yet, the rationale for the recommendation to change is based on the listing of the Yosemite toad and mountain yellow-legged frog. Again, it is necessary to define all of the stressors and plan components that necessitate a need to change and to provide scientifically supportable rationale for the need to change.

[3] Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=27634&inline=true

C. Birds (Late- Seral/Old Forest Associated and Complex Early-Seral Associated)

1. California Spotted Owl

The NTCA – Supplement states that, "The current plan direction was developed specifically to try to reduce the rate of loss of old forests and California spotted owl habitat from wildfire while protecting key habitat areas and key habitat elements. However, for a variety of reasons, the pace and scale of fuels reducing activities has not been sufficient to reduce the wildfire threats to habitat." The NTCA – Supplement only mentions wildfire as a stressor to the California spotted owl and defines an insufficient pace and scale of fuels treatments as the roadblock. There are two very significant flaws with this that have a cascading effect on the forest planning process as it relates to maintaining viable populations of spotted owls; first, there is a growing body of data, as we summarize below, that strongly suggest fuels treatments that reduce forest canopy cover are a primary driver of the California spotted owl declines that have been observed on all Forest Service-managed lands in the Sierra Nevada over the past 20+ years. Therefore, increasing the pace and scale of mechanical fuels treatments would also increase the pace and scale of the spotted owl decline. Second, current data, as we also summarize below, indicates that California spotted owls use burned areas of all severities for foraging and/or nesting, but do not use areas that burned and were subsequently salvage logged; therefore, logic dictates that wildfire is less of a threat than considered in the existing forest plans, while salvage logging represents a significant threat that results in a loss of nesting and foraging habitat. The adverse effects of reducing canopy cover to reduce fuels and harvest timber and the adverse effects of salvage logging to California spotted owls must be acknowledged and addressed through species-specific plan components (fine-filter), as outlined in FSH 1909.12. Based on the declines in spotted owl populations on Forest Service lands and the correlation of the decline to fuels treatments and salvage logging, despite the protections afforded to the species through the existing forest plans in the form of Protected Activity Centers and Home Range Core Areas, the Forest Service should take this opportunity to change the current plan components to better protect spotted owls from the adverse effects of fuels treatments and salvage logging and to ensure the forest plans do not violate Forest Service direction defined in FSM 2672.1, which states, "Sensitive species of native plants and animals must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing."

The best available scientific information suggests that uneven-aged vegetation management conducted to reduce fuels and harvest timber represents a significant threat that adversely affects the spotted owl at all spatial scales. In the central Sierra Nevada, Seamans and Gutierrez (2007) found that altering mature forest within California spotted owl territories negatively affected colonization and increased the likelihood of breeding dispersal within 0.7 mile of a territory center. In an attempt to explain the declines they observed on the Eldorado study area, Temple and Gutierrez (2013) note that abandoned territories may not have been colonized because of habitat alteration. On the Plumas-Lassen study area, spotted owls selected against Defensible Fuel Profile Zones (DFPZ), networks of interlocking landscape fuel breaks that often include a timber harvest component, and spotted owl home range sizes were positively correlated with total amount of fuel treatments within the home range (Keane et al. 2010). Blakesley et al. (2005) found that although owls were nesting and roosting in a variety of forest stand types, site occupancy and apparent survival decreased with decreasing amounts of habitat classes known to

be selected by California spotted owls at the landscape scale and reproductive output decreased as the amount of non-habitat within the nest area (502 acres) increased. Based on 20 years of data from the Eldorado study area, Tempel et al. (2014) found that medium intensity timber harvests, characteristic of Forest Service fuels treatments that reduce vertical forest structure and understory complexity, were associated with reduced spotted owl reproduction, survival, and territory colonization rates, as well as increased territory extinction rates; reproduction appeared sensitive to even modest amounts of medium-intensity timber harvests. These studies suggests that fuels treatments negatively affect spotted owls at the home range and landscape scales by decreasing habitat quality, reducing carrying capacity, increasing dispersal, and reducing colonization and reproduction. Also of note, while Tempel et al. (2014) found that high severity wildfire was negatively associated with colonization, 5 of 9 burned territories in the study remained occupied in all years after fire and the study did not separate the effect of salvage logging from high severity fire, making it impossible to determine if salvage logging and/or high severity wildfire were negatively associated with colonization.

In a study of California spotted owls in unmanaged mixed-conifer forests of Yosemite National Park, Roberts et al. (2011) found no difference in occupancy between burned and unburned sites across all burned survey areas, the mean (SE) proportion of area burned at unchanged, low, moderate, and high fire severity was 8% (2), 25% (4), 29% (4), and 14% (4), respectively. In a large-scale study in managed forests throughout the Sierra Nevada, Lee et al. (2012) examined 11 years of U.S. Forest Service breeding-season survey data from 41 California spotted owl sites burned in six forest fires and 145 sites in unburned areas and found that mean occupancy from 2001–2007 was 0.761 ± 0.045 at unburned sites, 0.802 ± 0.035 at burned sites, despite including owl sites with well over 50 percent high-severity fire in the study. Lee et al. (2012) also noted that salvage logging occurred on eight of the 41 burned sites; seven of the eight sites were occupied immediately after the fire but none were occupied after salvage logging. Clark et al. (2013) examined how fire and subsequent salvage logging affected occupancy dynamics of northern spotted owls in three fires and an unburned area in southwestern Oregon and found that extinction probabilities were greater after post-fire salvage logging. Roberts et al. (2011) note that fire does not reduce the probability of spotted owl occupancy and that fire, particularly fire resulting in low to moderate tree mortality, can retain residual habitat features that are important for roosting and reproducing California spotted owls. Although Clark (2007) showed northern spotted owl occupancy declined and local extinction increased immediately following fire; their results were confounded by post-fire salvage logging in the study area. Roberts et al. (2011) states that the disparity of the results of Clark (2007) and the results of her study suggests that salvage logging may have detrimental effects on spotted owl occupancy. Clark et al. (2013) suggests that salvage logging within spotted owl home ranges be avoided to limit the negative effects of salvage logging.

2. Northern Goshawk

Overwhelmingly, scientific data suggests goshawks usually nest in mature forests with large trees and relatively closed canopies (60 to 90 percent) (Squires and Kennedy 2006). Desimone (1997) prescribed little or no habitat alteration within aggregate nest stands and Bright-Smith and Mannan (1994) stated that tree harvest methods that create large areas with reduced canopy cover to less than 35 to 40 percent may be particularly detrimental to potential goshawk foraging habitat. Reynolds (1989) stated that practices such as selective overstory removal or patch and

clearcut harvesting, resulting in either a complete removal of trees or a reduction of the stem density and canopy cover throughout management units, lower the quality of goshawk nesting habitat. The concept of the Post-Fledging Area (PFA) was developed by Reynolds et al. (1992) and empirically supported by studies of family movement patterns (Kennedy et al. 1994, Kenward et al. 1993, and Kennedy and Ward 2003). PFAs are usually in mature forests with dense canopies and small openings (Daw and DeStefano 2001, Finn et al. 2002, McGrath et al. 2003); these structural components appear to be important to site occupancy (Finn et al. 2002). Reynolds et al. (2008) recommends maintaining at least 40 percent old forest cover at the 420-acre PFA scale. Due to their reliance on closed canopied forests at multiple scales, the long-term viability of the goshawk in the plan area conflicts with the NTCA – Supplement's belief that closed canopied conditions contribute to reduced fire resilience and that canopy cover should be reduced to increase resilience and provide heterogeneity. It is therefore necessary to develop specific plan components that ensure sufficient amounts of high canopy cover forested habitat is available to provide nesting, post-fledgling, and foraging habitat at all spatial scales for goshawks.

Although there is little data on the use of burned forests by goshawks, at least two PACs continue to be used for nesting this spring after the Rim Fire, despite burning to such an extent that the Forest Service determined the PACs should be redrawn. While we acknowledge there is relatively little information on the effects of wildfire or salvage logging on goshawks (i.e., habitat quality and long-term site fidelity), unlogged mixed severity burned forests appear to continue to provide goshawk nesting habitat, as demonstrated by their persistence within the Rim Fire. Squires and Reynolds (1997) documented goshawks breeding for several seasons following the die-off of trees affected by beetles near nest stands. Although not analogous due to the difference in disturbance type, this does suggests areas that experience significant live basal area losses may still provide old forest structure and an ephemeral pulse of resources goshawks can capitalize on for at least a few years. Because goshawks are adversely affected by reductions in canopy cover in unburned forests, yet continue to use forests that experience significant losses in live basal area, it is conceivable that salvage logging practices that reduce the complexity of early seral forests near goshawk activity centers are likely to adversely affect the quality and/or quantity of nesting, post-fledging, and foraging habitat associated with nests. Plan components should be developed to minimize the effects of salvage logging on the complexity of early seral forests associated with goshawk nests and PFAs.

D. Mammals (Late-Seral/Old Forest Associated)

The NTCA – Supplement only mentions wildfire as a stressor to old forest associated mammals and defines an insufficient pace and scale of fuels treatments as being a barrier to reduce the threat. However, as is the case with California spotted owl, high canopy cover and large trees and snags are important components in both fisher and marten resting habitat. Canopy cover is consistently the most important variable distinguishing resting sites from available sites for fishers, with results suggesting a minimum canopy cover target of approximately 60 percent (Purcell et al. 2009). In addition, Thompson et al. (2011) found that canopy cover averaged 63 percent across fisher home ranges. Canopy cover is also influential for martens, which generally do not occur in areas where canopy cover is less than 30 percent (Spencer et al. 1983). In contrast to the notion that pace and scale of treatments has not been sufficient to reduce the threat of wildfire to fishers and a need to change the forest plan is therefore warranted, Garner (2013)

found that fishers avoided areas within 200 meters of fuels treatments, which suggests that mechanical fuels treatments are themselves a threat to fishers and increasing pace and scale of mechanical fuels treatments is likely to adversely affect fishers. This suggests that fishers may be adversely affected by fuels treatments and increasing pace and scale should be done with caution. Therefore, we believe it is necessary to develop standards and guidelines specifically designed to ensure long-term viability of fisher populations in treated stands.

While there is likely a high-severity burn patch size threshold at which fishers are adversely affected, Hanson (2013) found fishers actively using areas where greater than 50 percent of the basal area was lost during wildfire, as far as 10 kilometers inside the fire perimeter, 10 years after a fire on the Sequoia National Forest. Hanson et al. (2013) demonstrates that fishers can persist in areas that experience mixed-severity fire for at least a decade post-fire and that mixed-severity fire, in the absence of salvage logging, is not as great of a threat as is implied in the NTCA – Supplement. We also want to point out that because fishers can persist in mixed-severity burned areas, but avoid openings and unburned forested areas with 40 percent or less canopy cover (Jones 1991), it is reasonable to assume that fishers will avoid salvage-logged areas where canopy cover has been reduced to below 40 percent and salvage logging has adversely altered the complexity of the early seral stage of the forest that allows fishers to persist in burned landscapes with less than 40 percent canopy cover. Therefore, it is also necessary that forest plan components be created specifically to minimize the effects of salvage logging to fishers in burned areas with pre-burn fisher occupancy.

E. Birds (Meadow and Riparian Associated)

The NFCA – Supplement states that the resource condition for birds associated with meadows and riparian areas is moderate and that the trend is stable to slightly declining. There is no information presented in the bioregional or forest assessments to support this conclusion. To the contrary, we find that based on recent declines in willow flycatcher and great gray owl, and monitoring results on yellow warbler there is reason to believe that bird trends are downward and that habitat conditions resulting from ongoing management are a concern. For example, the condition of riparian shrubs (Roberts et al. 2011) and its impact on nesting of yellow warbler was noted in a recent report on this Management Indicator Species. Nesting for willow flycatcher is also affected by the health and age structure of willow communities in meadow systems (see conservation assessment of willow flycatcher in Britting et al. 2012).

It is somewhat unclear, but the NTCA – Supplement appears to indicate that no change is needed to the current forest plans to address conservation of birds associated with meadows and riparian areas. We believe this is an incorrect conclusion based on the declines noted for key species and the impacts of grazing on riparian shrubs. We ask that you include management of riparian and meadow birds as a focus for changed management in the revision process. The needs of these species should not be overlooked as you revised the forest plan to integrate the plan components to better address the ecological conditions of meadows and their use as forage for livestock.

XI. Range

Please ensure management actions after fire contain a prescribed rest period for post-fire recovery.

Range management on all forests need a fence and water development inventory. Due to range staff capacity, implementation of this could occur through partnerships with local organizations. This section also needs to specify Great Basin range management components, as they differ greatly from westside rangelands.

XII. Timber

A. Eastside Ecosystems

Timber extraction on the eastside is management driven. Fuels reduction, conifer encroachment, beetle kill or hazard trees, salvage logging and habitat restoration are some of the topics that need to be individually addressed in the timber section. Friends of the Inyo would like to see this section include strong language to protect eastside forests from inappropriate forest management. Additionally, timber contractors utilized for various projects should be required to restore roads and vegetation impacted by their operations. Timber contracts should contain a cost-recovery strategy for restoration of these project areas.

B. Biomass Utilization

Plan components should be developed to support SB 1122 compliant facilities for biomass utilization of materials from sustainable forest management. Key areas (e.g., site locations) on each national forest should be identified in collaboration with stakeholders to utilize forest residue from restoration treatments to limit emissions from pile burning and to utilize heat and electricity within local communities as a first priority.

Plan components should be developed that support small wood utilization (e.g., post and pole operations) to coincide with the enormous need for plantation restoration currently and in the future. Plan components should also be developed to support the certification of marking that is consistent with North et al. (2009; GTR -220) and North 2012 (GTR-237) should be incorporated into each forest plan. Plan objectives should identify the pace of application and standards would ensure tee marking to achieve heterogeneity is developed to its highest levels, supports appropriate ecological outcomes, and results in increased forest diversity at multiple scales.

The NTC documents should clearly disclose that the past rates of harvest where scientifically unsound and provide no defendable reference or target for the future.

C. Herbicides for Vegetation Management

The forest plan revisions should call for a new Vegetation Management for Reforestation EIS to analyze the environmental impacts of the use of chemical herbicides and other forms of vegetation manipulation. The last time the Forest Service in Region 5 conducted an environmental analysis of this type was 1989, and the need for new analysis based on new information is now seriously overdue. The 1989 EIS followed upon a 5-year moratorium on chemical herbicide use region-wide, that resulted from lawsuits brought by the public. The science review team that created the SNEP reports did not believe that the Forest Service was

going to resume herbicide use for vegetation management, and thus did not include it in their analysis (pers. comm., science team leader Don Erman). Shortly after the SNEP publications, the region did resume use of herbicides, and within a decade had exceeded the use for all other regions in the country combined. Region 6, by contrast, has not used herbicides in this manner since 1984.

It is necessary now to engage scientists in re-evaluation of the use of agricultural herbicides on public forest lands that are supposedly managed for ecological integrity. Herbicide use destroys key species and values associated with complex early seral forest ecosystems. There is a need to understand the role of herbicide use in pollinator declines, low reproduction of rare species, loss of habitat for deer and other wildlife, changes in fire behavior in response to increased plantation acres, loss of quantity and quality of the native plant seed bank while invasive species increase, and other cumulative impacts from herbicide use. Spraying removes key components of early seral forest ecosystems, potentially affecting food dynamics across all trophic levels, and may irreparably affect forest diversity—and therefore resilience to climate change--over time.

In the last decade, the Forest Service contracted with a company in New York (Syracuse Environmental Research Associates, Inc.) to conduct analysis of the scientific literature pertinent to the chemicals the Forest Service chooses to use for vegetation management, ostensibly bringing their knowledge base up to date. Nevertheless, key pieces of information are still completely lacking, such as test results for endocrine disruption, mutagenicity, immune system effects, and reproductive toxicity for the chemical products as they are actually applied on the forests, as mixtures of several different chemicals. Because of this and other defects in the regulatory system, simple adherence to the label directions for the products is not a substitute for NEPA's new information requirements. Further, the SERA analyses are focused on toxicological data endpoints, with no information about the ecological impacts of spraying. NEPA requires that such impacts be evaluated in an environmental impact statement, and it is appropriate that the forest plan revisions address this issue. The best way to achieve the necessary analysis is to call out the need for change: a new EIS for vegetation management for reforestation.

XIII. Energy and Minerals

The current forest plans as amended do not and could not have anticipated the changes in energy demand (e.g., wind, solar, geothermal, oil and gas) that are occurring across the country in the climate of "energy independence". Because ecological integrity (36 CFR § 219.9) is so fundamental to the 2012 Planning Rule we are concerned that clear direction be developed in the forest plans to address how ecological integrity will be consistently maintained in spite of increasing energy demand.

Mineral extraction often comes with a high pollution and natural resources price tag. Plan components should be developed regarding the protection of water quality, at-risk species, clean up and bonded site restoration. Fracking is one example of a new practice that has not been addressed on Forest Service lands in the Sierra Nevada to our knowledge.

We believe that plan components need to be developed to address climate driven dry periods and the protection of Forest Service resources as a part of the FERC relicensing process. Relicensing is the time to establish flow conditions that protect Forest Service water rights and public

resources under changing climate conditions not anticipated in the last plans. The forest plan provides the basis for which the Forest Service makes the request for conservation measures during the relicensing process. Without a foundation in the forest plan to support the requested measures, necessary protections for water resources might not be adopted by FERC.

XIV. Recreation

We need to acknowledge the economic value recreation has on each national forest. Clearly defined Desired Conditions and Objectives need to be set for each individual forest for sustainable recreation, including dispersed and developed recreation activities and uses. Areas that are well loved and see high use should have local revenue allocated to manage the recreation resource in a sustainable way. Designations such as scenic and recreational areas provide funding for such management. For example, high use areas on the INF are in desperate need of recreational resources such as bear boxes, trash receptacles, toilets and kiosks with maps and forest information.

Working with partners, local agencies, and organizations can enhance the recreational experience and build capacity. The agency should use partnerships strategically to address capacity constraints, while also recognize many partners and non-governmental organizations rely on increasingly limited and strained philanthropy and grant opportunities. Recreational plan components need to include guidance on special use in Ski Areas under permit from the Inyo.

XV. Cultural Resources

Please also include as a strategy in the plans for the utilization of partnerships to protect cultural and historically significant areas and provide feasible opportunities for responsible research to occur in these areas. If capacity is an issue for providing researchers with permits, this should be addressed in plan components.

Plan components should be included to restore and enhance plants of cultural importance to Native Americans. Management strategies should be developed with the Native American community on each national forest regarding burning and harvesting of plant materials. Traditional Ecological Knowledge should drive project designs for the benefit of local Native American tribal groups. Ceremonial sites, gathering areas, trails, teaching opportunities, and training of Native American burn crews for ecological and cultural burning should be fostered in the forest plans with plan components developed in collaboration with Forest Service during Tribal Consultation throughout the plan revision process.

XVI. Wilderness Inventory and Evaluation Process for Forest Plan Revision, Wild & Scenic Rivers and Other Special Designations

The preliminary wilderness inventory is a good example of transparency, repeatability, and coherence. We hope that this process will serve as an example in future analyses during the forest planning process. We commend Forest Service staff working on this process for their commitment to high-quality analyses while facing time pressures and budgetary constraints.

A. Methodological Rigor

We appreciate the coherence and transparency of the preliminary wilderness inventory process. The process document is brief (3 pages) and easy to understand. The inventory accurately describes the requirements and criteria contained in the Wilderness Evaluation Handbook (Chapter 70 of the Planning Directives, as edited by the Federal Advisory Committee) and describes how those requirements and criteria have been applied to the process of inventorying and evaluating lands suitable for wilderness designation.

One cornerstone of a rigorous analytical method is repeatability. The outline of the inventory and evaluation is clear and detailed enough to allow anyone, in theory, to be able to repeat the process and independently verify the results.

B. Public Involvement

The document entitled "Wilderness Inventory and Evaluation Process for Forest Plan Revision" (updated 6/6/2014) was posted to the USFS Region 5 web site, along with detailed maps of the three early-adopter forest inventories and an overview map.

The public was also given the process document and was shown the maps during at least three public meetings held in the proximity of the Sierra, Sequoia, and Inyo National Forests. We are pleased to see that the Sierra Nevada forests are adhering to the Federal Advisory Committee's recommendations to engage the public at each step of the wilderness inventory and evaluation process—and we appreciate the opportunity to comment on the process here.

Publishing the inventory maps and data layers online in a format other than jpeg would further aid the public in viewing the maps at multiple scales and adding additional layers overtop of the roadless inventory to examine the overlap between the inventory and other resource values. Please consider publishing the data and maps in a more flexible format. For example, ESRI, Inc. has developed an application called "ArcGIS Viewer for Flex."[4] This application allows the user to interact with a map and several data layers on a single webpage.

C. Additional Steps in the Inventory Process

As indicated in steps 12 and 13 of the inventory process, the public will be invited to give feedback on the preliminary inventory and propose citizen-inventoried roadless areas that may or may not be over 5,000 acres and have wilderness character that deems them suitable for inclusion in the final wilderness inventory. Consistent with The Wilderness Act, the directives state that any area containing less than 5,000 (non-contiguous) acres should be included in the inventory if it is "of sufficient size as to make practicable its preservation and use in an unimpaired condition." We encourage you to include some areas smaller than 5,000 acres in response to public comment.

We will submit a list and map of recommended areas not currently in the preliminary wilderness inventory at the earliest phase of the NEPA process—"scoping."

[4] http://resources.arcgis.com/en/communities/flex-viewer/index.html

D. Incorporating Travel Analyses (Subpart A) in the Wilderness Inventory

We recognize that the Region's wilderness inventory and evaluation team has not yet received the final reports of minimum road system analyses from the Sierra, Sequoia, and Inyo National Forests. This is a major lost opportunity, as the Travel Management Rule has been "on the books" for 9 years and the primary purpose of this "left side" minimum necessary road system analysis is to inform forest planning.

That said, the Sequoia National Forest has completed their minimum necessary road system analysis, but the report has been held up for several months at the Region 5 office waiting for a signature of approval. Signing off on the report will take no additional money and little time. Yet it will indicate which roads on the forest are no longer needed and, therefore, can be removed from the wilderness inventory maps for the purpose of determining roadless areas—per the Chapter 70 directives. Please sign off on the Sequoia's travel analysis report as soon as possible so the wilderness inventory team may complete the Sequoia wilderness inventory with the most updated and best available information.

For the other two national forests, we request that you complete travel analysis concurrent with forest planning so that the wilderness inventory maps may be adjusted and so that management areas can be assigned in accordance with desired conditions of the road system.

Overall, we support the Region's approach toward evaluating road improvements in the inventory process. Consistent with the Chapter 70 directives and federal advisory committee's recommendations, the inventory generally includes areas with roads that are currently closed (ML 1) as identified by Objective Maintenance Level. Otherwise, areas with open roads are generally excluded from the inventory.

We are curious, however, how the Region interpreted Directive 71.22a (2) (c) that excludes roads from the inventory that do not meet this standard: "have been improved and are maintained by mechanical means to ensure relatively regular and continued use." Considering the massive maintenance backlog in the three forests, we are skeptical that all of these roads are maintained to ensure regular and continued use. Please provide the method and rationale for not excluding any ML 2 roads.

E. Wilderness Evaluation Stage

The wilderness evaluation process will not begin until after public scoping during NEPA, but we would like to comment on a section of the process document that does not accurately match the process outlined in Chapter 70 of the directives.

Step 2 of the evaluation section describes the following process:

> For each area in the inventory, examine the extent of authorized and maintained motorized trails. Make recommendations on whether to eliminate the area from further consideration, to eliminate a portion of the area and reshape it to exclude authorized motorized trails, or continue to evaluate the whole area. These recommendations will be

presented to the responsible official who will make the final decision on what to carry forward for evaluation. This early evaluation step is based on the criteria found in Ch. 70, 72.1 (5).

Section 72.1 in the handbook does convey the need to evaluate each area identified during the inventory process with respect to its wilderness character—including naturalness, opportunities for solitude, opportunities for primitive recreation, presence of ecological, geological, or other scientific, educational, scenic, or historical features, and manageability. The handbook, however, directs the responsible official to consider *all* areas in the final inventory during the comprehensive evaluation process. The evaluation process outlined by the region appears to add a new step to the process that could eliminate some areas in the final wilderness inventory from consideration *before* they receive the comprehensive wilderness evaluation.

This "early evaluation" step does not match the directives and could preclude some areas from being evaluated on their merits for naturalness, recreation opportunities, and ecological and scenic features based solely on the presence of motorized trails. All areas that appear in the final wilderness inventory must be evaluated in a comprehensive process that looks at all components of wilderness character at the same time. The "early evaluation" process gives prominence to one aspect of wilderness character—motorized use—before considering the counterbalancing wilderness values. Because this process allows for the elimination of areas that are in the final wilderness inventory from being evaluated on all wilderness characteristics, it is contrary to the Chapter 70 directives.

We request that you eliminate this extra step in the evaluation process.

F. Legal Standard for Wilderness/Roadless Area Analysis and Protection

Court decisions have defined well the standard for adequate legal analysis and federal decision-making in regard to roadless areas and wilderness recommendations. This was most recently documented in California Resources Agency v. USDA in regard to the Southern California Forest Plan Revisions. The Forest Service must thoroughly examine the impacts of placing all or portions of roadless areas under non-wilderness prescriptions and/or zoning in the Forest Plan Revisions. The Revisions must include a sufficient range of alternatives that fully address roadless and wilderness concerns. In addition, the Forest Service must consider the State of California's roadless area conservation policy and consult with the State in regard to the protection and conservation of specific roadless areas proposed in the Forest Plan Revisions.

G. Wilderness Management on the Inyo National forest

Wilderness-specific Management Plans are lacking for the Boundary Peak, Inyo Mountains, Owens River Headwaters, and White Mountains Wilderness Areas. These separate wilderness areas have unique ecological and geographical elements and need management direction beyond what is provided in the Inyo NF LRMP. The Inyo needs to have wilderness rangers brought back on staff. The western portion of the INF sees extremely high wilderness use. The current permitting system does not suffice in determining how many users these areas see, or the impact these users have to sensitive alpine habitats. Most users know there is no wilderness presence or backcountry law enforcement, so they do not obtain the necessary permits. Management of

wilderness on the Inyo has been abandoned. Regional Forest Service staff should mandate wilderness management. Although a small percentage of wilderness area on the Inyo has burned since 1944, recent fires have burned with high severity. With climate change and fire dynamics changing, the new plan should include wilderness directives for wildfire.

H. Wild and Scenic Rivers

1. Comprehensive River Management Plans

We appreciate that the Need for Change document recognizes that that two Wild and Scenic Rivers designated by Congress in 2009 on the Inyo National Forest lack Comprehensive River Management Plans (CRMPs) and river corridor boundaries, and require documentation of their outstandingly remarkable values, free-flowing condition, and water quality. We commend the Forest Service for committing to identifying a process and timeframe for developing and completing the CRMPs for these streams in the Need for Change document.

We also appreciate that the Need for Change document commits to reviewing and updating management direction in existing CRMPs for existing Wild and Scenic Rivers on all three early adopter Forests. This is particularly important since the Forest Assessments noted a significant increase in recreation use along Wild and Scenic Rivers, with undesirable effects on vegetation, water quality, and habitat.

2. Management of Wild and Scenic Rivers on the Inyo National Forest

CRMPs are needed for the recently designated Cottonwood Creek Wild and Scenic River in the White Mountains and the Owens River Headwaters in the eastern Sierra Nevada. There is no current assessment of upland ecosystem conditions in the Owens River Headwaters, nor have outstanding remarkable values been fully identified for segments, particularly for the upper segments of Deadman Creek. Plan documents containing water quality conditions should have indices, which are developed and defined in the plan. Language such as “free flow” also needs better definition. Multiple grazing allotments within Wild and Scenic River corridors contain meadows within these allotments that are rated as “Functional at Risk.” Grazing needs to be sustainably managed using new scientific information on the impacts of grazing in such areas. Friends of the Inyo and other groups have several recommendations for Wild and Scenic River additions. These will be presented in future comments.

3. Systematic Wild and Scenic River Inventories

The 2012 Planning Rule requires that Forest Plan Revisions identify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System, unless a systematic inventory has been previously completed and documented, and unless there are no changed circumstances that warrant additional review.

It seems clear that both the Inyo and Sequoia Forests have identified rivers and streams eligible for Wild and Scenic River protection since the previous Forest Plans were completed. However, it remains unclear that eligible streams were identified as part of a systematic and comprehensive inventory. If existing planning records fail to document the completion of systematic and

comprehensive inventories on the Inyo and Sequoia Forests, than the Forest Service must complete these inventories as part of the Forest Plan Revisions. It also seems clear that the Sierra Forest has not conducted any kind of systematic and comprehensive inventory, despite the fact that its 1992 Forest Plan Record of Decision made a commitment to conduct such an assessment. The Need for Change document should, based on the existing administrative record, clarify whether inventories have been completed on the Inyo and Sequoia Forests. If the administrative record does not show such inventories were completed, the Forest Service should commit to completing systematic inventories in the Forest Plan Revisions. If the administrative records indeed prove that systematic inventories were completed, than the Need for Change document should address whether changed circumstances warrant additional review. In addition, the Need for Change document should commit to completing a systematic inventory on the Sierra Forest as committed to in the previous plan.

4. Suitability Studies and Recommendations

The 2012 Planning Rule remains silent about whether the Forest Plan Revisions should include the second step of the two-step Wild and Scenic River study process. The second step is the suitability study, which typically leads to an agency recommendation to Congress to protect eligible rivers and streams. Although the Planning Rule clearly gives the agency latitude about the completion of suitability studies, the Forest Service Manual also clearly states that "The preferred approach is to proceed with determining suitability in the land management planning process." The Need for Change document should definitively state whether the Forest Service intends to complete suitability studies in the Forest Plan Revisions, and if not, provide a clear and reasonable explanation as to why.

I. Management of Pacific Crest National Scenic Trail (PCNST) on the Inyo National Forest

As previously mentioned, the Inyo portion of wilderness, including that along the PCNST, needs wilderness and trails staffing. Presence and management along the trail corridor will be vital to achieve the desired conditions of recreation experience and visual resources.

J. Desired Conditions and Need to Change: Wilderness and Other Designated Areas

1. Other Designated Areas

The Planning Rule requires the Forest Service to assess the potential need and opportunity for additional designated areas, which then enables the Forest Service to designate additional areas as needed. According to the NFMA regulations, the responsible official "shall…identify existing designated areas other than [wilderness and wild and scenic rivers] and determine whether to recommend any additional areas for designation. If the responsible official has the delegated authority to designate a new area or modify an existing area, then the responsible official may designate such area when approving the plan" (36 CFR 219.7(c) (2) (vii)). Clearly the responsible official will need to know the current trends and conditions of designated areas and whether there is a need to change the forest plan before making these decisions. If designations are not made now, management actions could degrade or destroy values.

The revised Need to Change Analysis still lacks any discussion of the need for new designations, despite it being a major content area in the assessment process. The entire "analysis" of need to change for other designated areas in the analysis supplement is as follows:

> Resource condition: moderate to good
> Trend of condition: stable to declining, due to fire and recreation
> Relationship between current plan direction and resource condition: management direction for other designated areas is adequate
> Change recommended: No
> Rationale for recommendation: Current condition and trend does not warrant changes to management direction for other designated areas. The declining trend due to fire and recreation is addressed in sections above.

Clearly, this is inadequate. Simply placing the text into a table does not make it an analysis. The "resource condition" is not defined; it is unclear what resource is being referred to (*all resources on all types of designated areas*?). The resource condition is asserted to be "moderate to good" without any reference to the forest assessments (in which there is, regardless, no analysis of condition or trend). The trend is not defined or justified with any information from the assessment. The need to change recommendation should discuss *both the conditions of the designated areas on the ground and the need to designate new areas*. We assume that the statements above are analyzing the condition on the ground, but it is difficult to tell.

Here is an example of how one would go about assessing the need to change for a single, specific resource for a specific type of designation (this would be repeated for every resource of concern and for each designation type):

> 1. State the condition of concern for a type of designation.
> Example: *Ecological representation in RNAs.*
>
> 2. Identify the specific desired condition for that specific designation.
> Example: *The desired condition is a network of research natural areas that represents the full diversity of ecosystems found across the region and whose size and number are sufficient to adequately represent the botanical features to be researched and resilient to natural disturbances, climate change, and other anthropogenic stressors, per the Forest Service Manual 4063.02:*
>
> > *The objectives of establishing Research Natural Areas are to:*
> >
> > *1.* ***Maintain a wide spectrum of high quality representative areas that represent the major forms of variability found in forest, shrubland, grassland, alpine, and natural situations that have scientific interest and importance that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity.***
> > *2. Preserve and maintain genetic diversity, including threatened, endangered, and sensitive species.*
> > *3. Protect against human-caused environmental disruptions.*

4. Serve as reference areas for the study of natural ecological processes including disturbance.
5. Provide onsite and extension educational activities.
6. Serve as baseline areas for measuring long-term ecological changes.
7. Serve as control areas for comparing results from manipulative research.
8. Monitor effects of resource management techniques and practices.

3. Assess the current condition of the designated areas (from bio-regional and forest assessments).
Example: *There are currently 3 RNAs across the Sierra National Forest, representing 7 of the 42 ecosystems found in the forest. The total area of the 3 RNAs is 4,505 acres with no connection among the sites.*

4. Identify the gap between the current condition and the desired condition.
Example: *There are 35 ecosystems in the Sierra National Forest that are not represented in RNAs, and the size and configuration of the current RNAs are insufficient to be resilient to natural disturbances, climate change, and other anthropogenic stressors.*

5. State the need to change the plan direction to move you from the current condition to the desired condition.
Example: *There is a need to identify and designate new research natural areas across the forest to meet the desired conditions we have identified.*

6. Identify plan components in an alternative that meet that need.
Example: *Alternative B in the revised forest plan identifies and designates 15 new RNAs of 83,000 total acres that adequately represent the ecological diversity of the forest and are of sufficient size and configuration to support non-manipulative research while being resilient to stressors.*

We would like to comment on the Desired Conditions statement for other designated areas, but it does not yet exist. We request that you explain how the need to change was determined without a statement of desired conditions.

2. Wilderness Areas

The Frequently Asked Questions section of the Preliminary Need for Change Analysis had claimed that "wilderness has a concurrent, separate process." The wilderness process is not separate. Wilderness is clearly outlined within the planning rule as a resource that will be assessed for condition, trend, opportunity, and need—and that assessment will inform the Need to Change Analysis. The NFMA regulations require that the responsible official "**identify and evaluate existing information relevant to the plan area for…existing designated areas located in the plan area including wilderness and wild and scenic rivers and potential need and opportunity for additional designated areas**" (36 CFR 219.6(1)(b)(15)).

We appreciate the clear, thorough, systematic, and transparent process to inventory wilderness areas suitable for designation (see comments above). The inventory process can be considered the analysis of *opportunity* for new wilderness designations.

The *need* for new wilderness areas is a separate analysis and should inform the wilderness evaluation process. The need to change analysis looks only at the current conditions of existing wilderness areas, but does not consider the need for new wilderness designations. It is impossible to assess properly the need for more designations without considering whether the current NWPS on the forests is adequate. There are a number of ways to assess adequacy, but one that is essential is whether the wilderness system is ecologically representative of the public forest landscape. This type of analysis has not been completed, nor has it been expressed as a desired condition.

We have requested a representation analysis of wilderness areas of the three forests numerous times, but have received no response. The Wilderness Society has, therefore, committed to conducting this analysis and submitting the tabular and spatial results during public scoping in August. In the interim, we are providing a preliminary analysis for the Inyo, Sierra, and Sequoia NFs (Appendix A, Tables 1-3).

XVII. Transportation Infrastructure Must be Recommended for Need To Change

A. Change Required to Transportation Infrastructure

We are disappointed that the NTCA does not include a recommendation for transportation infrastructure NTC, despite the fact that the road systems on the Sierra, Sequoia, and Inyo National Forests are indisputably unsustainable, as acknowledged in the forest assessments[5] and other Forest Service documents.[6]

We take issue with the determination made in the NTCA – Supplement that "New or changed plan components would not likely affect the condition of transportation and facilities infrastructure. Current management direction carried forward in revised plans can provide the guidance needed to manage road and trail systems for resource protection." To the contrary, roads are a fundamental determinant of ecological condition, as well as the fundamental enabling mechanism for practically all management and access activities on national forests. Without affirmative guiding direction in the forest plan, the road system will continue to undermine the ecological, fiscal, and social sustainability of the national forests.

Moreover, Forest Service planning regulations establish substantive requirements related to roads, infrastructure, and access that the Forest Service clearly cannot meet without changing current management direction. The intent of the regulations is that the Forest Service establishes plan direction for transportation infrastructure that will result in sustainable (fiscal and ecological) access and healthy aquatic and terrestrial systems. Specifically the rule at 36 CFR 219.8(a) and (b) requires that:

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[5] See Appendix B for relevant excerpts from the final assessments

[6] For example, see US Forest Service, 2005. *Forest Scale Roads Analysis, Sierra National Forest*. Revised November 17, 2005. Secured in Freedom of Information Request filed by Wildlands CPR in 2006.

(a) …The plan must provide for social, economic, and ecological sustainability within Forest Service authority and consistent with the inherent capability of the plan area, as follows:
(1)…[I]nclude 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 structure, function, composition, and connectivity, taking into account…(iv) System drivers, including dominant ecological processes, disturbance regimes, and stressors, such as … climate change… (vi) Opportunities for landscape scale restoration.
(2) *Air, soil, and water.* The plan must include plan components, including standards or guidelines, to maintain or restore:
(i) Air quality.
(ii) Soils and soil productivity, including guidance to reduce soil erosion and sedimentation.
(iii) Water quality.
(iv) Water resources in the plan area, including lakes, streams, and wetlands; ground water; public water supplies; sole source aquifers; source water protection areas; and other sources of drinking water (including guidance to prevent or mitigate detrimental changes in quantity, quality, and availability).
(3) *Riparian areas.…*
(4) *Best management practices for water quality.* The Chief shall establish requirements for national best management practices for water quality in the Forest Service Directive System. Plan components must ensure implementation of these practices.

(b) … The plan must include plan components, including standards or guidelines, to guide the plan area's contribution to social and economic sustainability, taking into account:
(1) Social, cultural, and economic conditions relevant to the area influenced by the plan;
(2) Sustainable recreation; including recreation settings, opportunities, and access; and scenic character;

The rule also requires at 36 CFR 219.10(a) and (b) that:

(a) …When developing plan components for integrated resource management … the responsible official shall consider: (1) …, trails, …(3) Appropriate placement and sustainable management of infrastructure, such as recreational facilities and transportation and utility corridors.

(b) (1) The plan must include plan components, including standards or guidelines, to provide for: … (i) Sustainable recreation; including recreation settings, opportunities, and access; and scenic character.

The draft handbook provides additional direction on addressing transportation infrastructure in the plan revision process:

> The plan should provide for a realistic desired infrastructure that is sustainable and can be managed in accord with other plan components within the fiscal capability of the planning unit and its partners….
>
> The central consideration in land management planning for infrastructure is that the integrated desired conditions and other plan components set a framework for the management of the plan area's infrastructure…
>
> For forest roads, the desired conditions should clarify the intended nature of the road system for the plan area and for management and geographic areas. The plan should identify the major arterial road system that provides primary access to, and within, the plan area. Determining the desired conditions, including the intended desired uses for management areas or geographic areas within the plan area, helps identify what type of road system is needed for access to and within these management areas or geographic areas…
>
> Based on the desired conditions, other plan components can be developed for the road system. These include objectives either for modifying the road system such as decommissioning and restoring roads in areas where existing roads are no longer desired or improving roads in areas where the road system needs improvement. The objectives should recognize fiscal limitations and relative urgencies in determining objectives for the road system. Suitability can include identifying what types of roads are suitable or not suitable for certain management areas and geographic areas. Standards or guidelines for road management may restrict road management activities in certain situations such as in riparian zones or sensitive scenic areas.

(Forest Service Handbook 1909.12, 23.22o, February 14, 2013 draft) Given the significant aggregate impacts of transportation infrastructure on landscape connectivity, ecological integrity, water quality, soils, access etc., we cannot conceive how the Forest Service would meet its substantive requirements without identifying a NTC related to transportation infrastructure.

B. Current Plans Do Not Address the Effects of Climate Change on Transportation Infrastructure

The sustainability of transportation infrastructure is an issue for these three forests even without the specter of climate change. When we consider climate change and its potential impacts on infrastructure, achieving sustainability is a much more daunting task. As a general matter, it is expected that climate change will be responsible for more extreme weather events, leading to increasing flood severity, more frequent landslides, changing hydrographs (peak, annual mean flows, etc.), and changes in erosion and sedimentation rates and delivery processes. Many roads and trails in national forests, if designed by an engineering standard at all, were designed for storms and water flows typical of past decades, and hence may not be designed for the storms in future decades[7]. Those that have were designed for storms and water flows typical of past

[7] Gucinski, Michael, Furniss, J., Ziemer, Robert, and Martha H. Brookes. 2000. *Forest Roads: A Synthesis of Scientific Information*. Gen. Tech. Rep. PNWGTR-509. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 103 pp. Available at http://www.fs.fed.us/pnw/pubs/gtr509.pdf.

decades, and most likely may fail under future storm scenarios. The likelihood of failure is higher for facilities in high-risk settings—such as rain-on-snow zones, coastal areas, and landscapes with unstable geology.[8]

This new reality argues for a forest-wide systematic review and modification of transportation infrastructure so that it can hold up in future storm events and be more sustainable. Activities will have to include: addressing fish passage, replacing undersized culverts with larger ones, prioritizing maintenance and upgrades (e.g., installing drivable dips and more outflow structures), and obliterating roads that are no longer needed and pose erosion hazards. The only way that this significant body of work will get done in a relatively short amount of time is if the Forest Service proactively plans to do it in a coordinated and prioritized way. The place to do that is in the forest plan revision starting in the NTC documents. Moreover, because the previous forest plans for the three forests did not consider the hydrologic impacts of climate change on infrastructure, or how the ecological effects of infrastructure would be exacerbated in a climate change world, there is clearly a need to change management direction for transportation infrastructure in the plan revision.

C. Roads Increase Habitat Fragmentation and Reduce Connectivity

To meet the regulatory requirement to maintain and restore ecosystems, the land management plan revision must strive to reduce ecosystem stresses that result in diminished forest resilience and resistance. The transportation system is one such stressor. Reducing its size and breadth by removing unneeded and problematic roads can help reduce the stresses on aquatic and terrestrial ecosystems imposed by roads and their fragmentation effects.

Characterized by high edge/interior ratios and isolated patches, fragmented forests will likely demonstrate less resistance and resilience. Fragmentation interferes with the ability of species to track shifting climatic conditions over time and space, and likely favors invasive species that have effective dispersal mechanisms at the expense of native species. Getting rid of unneeded roads, especially in potentially important corridors, and creating wildlife crossings over or under busy roads can mitigate some road-related fragmentation effects[9].

The National Fish, Wildlife and Plants Climate Adaptation Partnership in Strategy 1.4 of its Climate Change Adaptation Plan (2012) recommends "Conserv[ing], restor[ing], and as appropriate and practicable, establish[ing] new ecological connections among conservation areas to facilitate fish, wildlife, and plant migration, range shifts, and other transitions caused by climate change."[10]

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[8] USDA Forest Service. 2010. Water, Climate Change, and Forests: Watershed Stewardship for a Changing Climate, PNW-GTR-812, June 2010, p. 72 (emphasis added), *available at*: http://www.fs.fed.us/pnw/pubs/pnw_gtr812.pdf.

[9] Noss, R.F. 2001. Beyond Kyoto: forest management in a time of rapid climate change. Conserv. Biol. Volume 15, Number 3, June 2001. Pages 578-590.

[10] National Fish, Wildlife and Plants Climate Adaptation Partnership (NFWPCAP). 2012. National Fish, Wildlife and Plants Climate Adaptation Strategy. Association of Fish and Wildlife Agencies, Council on environmental Quality, Great Lakes Indian Fish and Wildlife Commission, National Oceanic and Atmospheric Administration, and U.S. Fish and Wildlife Service. Washington, DC.

D. Transportation Infrastructure Must be Part of a Sustainability Strategy

The transportation systems on the three forests are unsustainable. On an ecological level, roads directly and indirectly fragment and disturb habitat, pollute water, alter stream morphology, aid the spread of invasive species, result in unnatural wildfire ignitions, and cause direct mortality of species.[11] On a fiscal level, the Forest Service cannot afford its transportation system; it has a multi-billion dollar deferred road maintenance backlog, and can each year fund only a small fraction of its road maintenance needs.[12]

Transportation infrastructure should be viewed as a system stressor like anthropogenic climate change and invasive species, and considered in the context of achieving goals related to:

1) ecosystem integrity—including structure, function, composition, and connectivity of terrestrial and aquatic systems;
2) opportunities to restore landscapes;
3) air and water quality;
4) soil productivity, erosion, and sedimentation;
5) fish and wildlife habitat;
6) sustainable recreation;
7) scenic values;
8) ecosystem services;
9) opportunities to connect people with nature;
10) diversity of plant and animal communities; and
11) fiscal sustainability.

We provided information in our comments for the bioregional and forest assessments describing why and how roads are ecologically and fiscally problematic. Please refer to these comments and the scientific literature that we cited. In particular, please refer to the scientific literature reviews submitted in Appendices 1 and 2 as part of our comments on the Inyo National Forest Draft Assessment.

E. Desired Conditions for Transportation Infrastructure

We ask that you include the following desired conditions in the revised forest plan.

> Desired Condition -- The "minimum road system" necessary to meet the need for safe and efficient travel and for administration, utilization, and protection of NFS lands and resources (36 CFR 212.5 b) and that supports the ecological, fiscal, and social sustainability of the national forests.

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[11] For instance, see:
Gucinski, Michael, Furniss, J., Ziemer, Robert, and Martha H. Brookes. 2000. *Forest Roads: A Synthesis of Scientific Information*. Gen. Tech. Rep. PNWGTR-509. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 103 pp. Available at http://www.fs.fed.us/pnw/pubs/gtr509.pdf.
USDA Forest Service. 2001. Roads Analysis: Informing Decisions about Managing the National Forest Transportation System. Available at http://www.fs.fed.us/eng/road_mgt/DOCSroad-analysis.shtml
US Forest Service, 2005. *Forest Scale Roads Analysis, Sierra National Forest.* Revised November 17, 2005. Secured in Freedom of Information Request filed by Wildlands CPR in 2006.

[12] Ibid.

Desired Condition -- A streamlined road system that, over any given 5-7 year time period, can be fully maintained to standard to support sustainable (fiscal and ecological) access and healthy aquatic and terrestrial systems.

Desired Condition – A transportation system that provides safe access to recreation destinations, to sites where Native American traditional, cultural, and religious activities are practiced, and to other forest areas that generate economic benefits for local communities.

Desired Condition – Roads and trails that are no longer needed and are identified as key risk factors for other forest resources are decommissioned and restored to natural conditions.

Desired Condition -- Motorized route density adheres to scientifically accepted thresholds for terrestrial and aquatic species.

Desired Condition – A transportation infrastructure that is adapted to withstand the extreme weather events associated with changing climatic conditions that lead to increasing flood severity, more frequent landslides, changing hydrographs (peak, annual mean flows, etc.), and changes in erosion and sedimentation rates and delivery processes.

Desired Condition – Appropriately sized and adequately maintained transportation infrastructure that helps sustain water quality at a level that retains the biological, physical, and chemical integrity of aquatic systems.

Desired Condition – Appropriately sized and strategically place transportation infrastructure that increases resistance and resilience by reducing habitat fragmentation and establishing new ecological connections among conservation areas to facilitate fish, wildlife, and plant migration, range shifts, and other transitions caused by climate change.

Desired Conditions – A transportation infrastructure that helps to enable fully functioning watersheds that are resilient and recover rapidly from disturbances, and have a high degree of connectivity.

Desired Condition – A transportation system that is suitable for and reflects the desired use for administrative designations, management areas, geographic areas, and areas within the Recreation Opportunity Spectrum.

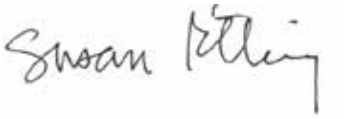
XVIII. Public Utilities

Plan components should be developed to better address the fragmentation and fire risk from transmission lines and how to ensure ecological integrity is maintained in spite of new energy proposals. Fire risk from timber operations, recreational activities and power lines and power line maintenance will increase in dry period. Plan components including operational and use/access restrictions are valid to plan for to reduce fire risk when facing long dry periods.

XIX. Conclusion

We appreciate the opportunity to provide feedback on the revised NTC documents. We look forward to discussing the above with your team as we continue in this planning process. If you have questions about these comments or would like to discuss them in more detail, please contact Sue Britting (Britting@earthlink.net; 530-295-8210).

Sincerely,



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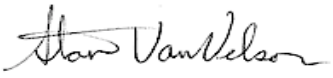

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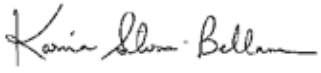

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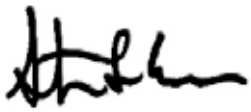

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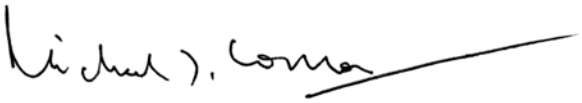

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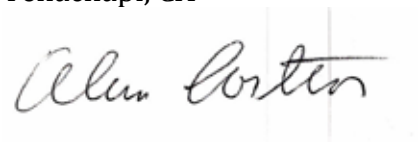

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Appendix A: Preliminary analysis of the representation of ecological types on three national forests.

Table 1. Sierra National Forest (in hectares)

Ecological Group	Wilderness	Non Wild	Total	% Wilderness
Mediterranean California Alpine Dry Tundra	10	0	10	100.0%
Mediterranean California Alpine Bedrock and Scree	78,607	9,008	87,615	89.7%
Sierran-Intermontane Desert Western White Pine-White Fir Woodland	1,370	165	1,535	89.3%
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland	56,107	10,600	66,707	84.1%
Mediterranean California Subalpine Woodland	2,282	909	3,191	71.5%
Rocky Mountain Aspen Forest and Woodland	1,975	1,256	3,231	61.1%
Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland	129	93	222	58.0%
Inter-Mountain Basins Big Sagebrush Shrubland	7,071	5,144	12,215	57.9%
Northern California Mesic Subalpine Woodland	8,289	6,691	14,980	55.3%
Great Basin Pinyon-Juniper Woodland	3,203	2,837	6,041	53.0%
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	639	632	1,271	50.3%
California Montane Jeffrey Pine-(Ponderosa Pine) Woodland	14,892	16,578	31,470	47.3%
Inter-Mountain Basins Big Sagebrush Steppe	977	1,660	2,637	37.1%
Mediterranean California Red Fir Forest	20,825	37,024	57,849	36.0%
Mediterranean California Foothill and Lower Montane Riparian Woodland	8,857	16,086	24,943	35.5%
Inter-Mountain Basins Semi-Desert Grassland	2	5	6	29.6%
Open Water (Fresh)	1,802	4,327	6,129	29.4%
California Montane Woodland and Chaparral	118	322	440	26.9%
California Mesic Chaparral	241	922	1,163	20.7%
North Pacific Active Volcanic Rock and Cinder Land	0	0	0	20.0%
Mediterranean California Mesic Mixed Conifer Forest and Woodland	14,114	97,171	111,285	12.7%
Mojave Mid-Elevation Mixed Desert Scrub	195	1,490	1,685	11.6%
Cultivated Cropland	2	21	24	9.2%
Mediterranean California Mixed Oak Woodland	1,037	16,827	17,864	5.8%
Northern and Central California Dry-Mesic Chaparral	115	3,920	4,035	2.8%

Ecological Group	Wilderness	Non Wild	Total	% Wilderness
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	7	7	2.5%
California Central Valley Mixed Oak Savanna	137	11,813	11,951	1.1%
California Lower Montane Blue Oak-Foothill Pine Woodland and Savanna	185	24,488	24,673	0.8%
Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland	205	36,570	36,775	0.6%
Temperate Pacific Freshwater Mudflat	1	477	477	0.2%
California Central Valley and Southern Coastal Grassland	0	996	996	0.0%
California Central Valley Riparian Woodland and Shrubland	0	119	119	0.0%
Columbia Plateau Western Juniper Woodland and Savanna	0	276	276	0.0%
Developed, Low Intensity	0	61	61	0.0%
Developed, Medium Intensity	0	2	2	0.0%
Developed, Open Space	0	752	752	0.0%
Harvested Forest - Northwestern Conifer Regeneration	0	175	175	0.0%
Harvested Forest-Shrub Regeneration	0	46	46	0.0%
Inter-Mountain Basins Cliff and Canyon	0	0	0	0.0%
North Pacific Wooded Volcanic Flowage	0	23	23	0.0%
Recently burned forest	0	1,679	1,679	0.0%
Sierra Nevada Cliff and Canyon	0	1	1	0.0%
Total	**223,387**	**311,174**	**534,561**	**41.8%**

Table 2. Sequoia National Forest (in hectares)

Ecological Group	Wilderness	Non Wild	Total	% Wilderness
Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland	6	0	6	100.0%
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	100.0%
North American Warm Desert Riparian Woodland and Shrubland	13	0	13	96.6%
North Pacific Wooded Volcanic Flowage	653	272	925	70.6%
Mediterranean California Alpine Bedrock and Scree	8,654	4,159	12,813	67.5%
Mojave Mid-Elevation Mixed Desert Scrub	4,940	2,977	7,917	62.4%
Inter-Mountain Basins Big Sagebrush Shrubland	22,323	13,948	36,271	61.5%
Inter-Mountain Basins Semi-Desert Grassland	30	19	49	60.8%
Great Basin Pinyon-Juniper Woodland	20,977	17,186	38,163	55.0%
Sierran-Intermontane Desert Western White Pine-White Fir Woodland	172	176	348	49.5%
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland	8,072	10,781	18,852	42.8%
California Montane Jeffrey Pine-(Ponderosa Pine) Woodland	22,110	45,265	67,375	32.8%
Inter-Mountain Basins Big Sagebrush Steppe	3,899	8,423	12,321	31.6%
Rocky Mountain Aspen Forest and Woodland	2,382	5,293	7,676	31.0%
Open Water (Fresh)	120	278	398	30.1%
Mediterranean California Subalpine Woodland	107	289	396	27.1%
Mediterranean California Red Fir Forest	4,178	12,053	16,231	25.7%
California Mesic Chaparral	126	372	498	25.3%
Northern California Mesic Subalpine Woodland	736	2,413	3,149	23.4%
Mediterranean California Foothill and Lower Montane Riparian Woodland	3,044	11,064	14,108	21.6%
California Montane Woodland and Chaparral	218	822	1,041	21.0%
Sierra Nevada Cliff and Canyon	4	22	26	16.0%
Mediterranean California Mesic Mixed Conifer Forest and Woodland	15,019	83,387	98,406	15.3%
California Lower Montane Blue Oak-Foothill Pine Woodland and Savanna	3,898	26,671	30,568	12.8%
Inter-Mountain Basins Semi-Desert Shrub Steppe	1	15	16	6.8%

Ecological Group	Wilderness	Non Wild	Total	% Wilderness
Mediterranean California Mixed Oak Woodland	3,610	54,710	58,320	6.2%
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	23	381	404	5.8%
Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland	289	4,962	5,252	5.5%
Northern and Central California Dry-Mesic Chaparral	87	1,567	1,655	5.3%
California Central Valley Mixed Oak Savanna	121	5,870	5,991	2.0%
Harvested Forest-Shrub Regeneration	2	204	206	0.7%
Harvested Forest - Northwestern Conifer Regeneration	2	266	268	0.7%
Developed, Open Space	5	906	910	0.5%
California Central Valley and Southern Coastal Grassland	0	2,594	2,594	0.0%
California Central Valley Riparian Woodland and Shrubland	0	54	54	0.0%
Columbia Plateau Western Juniper Woodland and Savanna	0	0	0	0.0%
Cultivated Cropland	0	2	2	0.0%
Developed, High Intensity	0	3	3	0.0%
Developed, Low Intensity	0	77	77	0.0%
Developed, Medium Intensity	0	6	6	0.0%
North Pacific Active Volcanic Rock and Cinder Land	0	0	0	0.0%
Pasture/Hay	0	5	5	0.0%
Recently burned forest	0	923	923	0.0%
Recently burned grassland	0	112	112	0.0%
Total	**125,822**	**318,528**	**444,350**	**28.3%**

Table 3. Inyo National Forest (in hectares)

Ecological Group	Wilderness	Non Wild	Total	% Wilderness
Undifferentiated Barren Land	2	0	2	100.0%
California Central Valley Mixed Oak Savanna	0	0	0	100.0%
Northern Pacific Mesic Subalpine Woodland	257	1	258	99.7%
California Lower Montane Blue Oak-Foothill Pine Woodland and Savanna	43	1	44	98.8%
Mediterranean California Alpine Dry Tundra	184	3	188	98.2%
Mediterranean California Mesic Mixed Conifer Forest and Woodland	2,926	224	3,150	92.9%
Inter-Mountain Basins Greasewood Flat	38	3	41	92.3%
Mediterranean California Alpine Bedrock and Scree	125,876	19,970	145,846	86.3%
Cultivated Cropland	45	7	53	86.1%
Mediterranean California Subalpine Woodland	1,332	237	1,569	84.9%
Sierran-Intermontane Desert Western White Pine-White Fir Woodland	2,332	461	2,793	83.5%
North Pacific Wooded Volcanic Flowage	525	105	630	83.3%
California Mesic Chaparral	3	1	4	77.5%
Inter-Mountain Basins Juniper Savanna	3,072	924	3,996	76.9%
Mediterranean California Mixed Oak Woodland	134	46	181	74.3%
Northern California Mesic Subalpine Woodland	7,520	2,709	10,229	73.5%
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland	40,642	14,698	55,341	73.4%
Mediterranean California Red Fir Forest	8,876	3,297	12,173	72.9%
Introduced Upland Vegetation - Annual Grassland	40	16	56	71.6%
Mediterranean California Foothill and Lower Montane Riparian Woodland	3,593	1,919	5,512	65.2%
Inter-Mountain Basins Big Sagebrush Steppe	81	45	126	64.0%
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	3,733	2,112	5,845	63.9%
Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland	3,553	2,022	5,574	63.7%
Rocky Mountain Aspen Forest and Woodland	4,880	2,922	7,802	62.5%
Open Water (Fresh)	1,891	1,215	3,106	60.9%
Sierra Nevada Cliff and Canyon	6,694	4,717	11,411	58.7%
North American Warm Desert Riparian Woodland and Shrubland	29	22	51	57.0%
California Montane Woodland and Chaparral	1	1	2	56.0%

Ecological Group	Wilderness	Non Wild	Total	% Wilderness
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	1,348	1,591	2,939	45.9%
Mojave Mid-Elevation Mixed Desert Scrub	10,411	12,751	23,162	44.9%
North American Warm Desert Volcanic Rockland	376	491	866	43.4%
North American Warm Desert Bedrock Cliff and Outcrop	4,213	5,541	9,754	43.2%
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	201	280	481	41.8%
North Pacific Montane Grassland	722	1,010	1,732	41.7%
Inter-Mountain Basins Cliff and Canyon	140	196	336	41.6%
Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland	11	16	28	40.7%
Rocky Mountain Subalpine-Montane Riparian Shrubland	10	16	26	39.7%
Great Basin Pinyon-Juniper Woodland	85,092	150,301	235,393	36.1%
North American Warm Desert Wash	44	82	126	35.1%
Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland	501	940	1,441	34.8%
Temperate Pacific Montane Wet Meadow	5	10	15	32.4%
California Montane Jeffrey Pine-(Ponderosa Pine) Woodland	10,656	22,710	33,366	31.9%
Inter-Mountain Basins Montane Sagebrush Steppe	15,556	37,142	52,698	29.5%
North American Warm Desert Playa	0	1	2	27.8%
Inter-Mountain Basins Big Sagebrush Shrubland	34,345	89,478	123,823	27.7%
Great Basin Semi-Desert Chaparral	81	285	366	22.0%
Inter-Mountain Basins Semi-Desert Grassland	15	56	70	20.9%
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	2	6	8	20.2%
Great Basin Xeric Mixed Sagebrush Shrubland	2,350	9,564	11,914	19.7%
Inter-Mountain Basins Semi-Desert Shrub Steppe	548	2,418	2,967	18.5%
Pasture/Hay	3	14	17	16.2%
Inter-Mountain Basins Mixed Salt Desert Scrub	2,786	15,144	17,930	15.5%
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	4	28	32	13.3%
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	99	723	822	12.0%
North Pacific Active Volcanic Rock and Cinder Land	132	1,399	1,531	8.6%
North American Warm Desert Pavement	1	14	15	7.0%

Ecological Group	Wilderness	Non Wild	Total	% Wilderness
Sonora-Mojave Mixed Salt Desert Scrub	12	213	225	5.2%
North American Arid West Emergent Marsh	2	122	124	1.3%
Inter-Mountain Basins Playa	8	867	875	0.9%
Developed, Open Space	3	1,210	1,212	0.2%
Developed, Low Intensity	0	404	404	0.0%
Developed, High Intensity	0	6	6	0.0%
Developed, Medium Intensity	0	51	51	0.0%
Introduced Upland Vegetation - Perennial Grassland and Forbland	0	45	45	0.0%
Mediterranean California Subalpine-Montane Fen	0	0	0	0.0%
Rocky Mountain Subalpine-Montane Riparian Woodland	0	17	17	0.0%
Total	**387,978**	**412,824**	**800,802**	**48.4%**

Appendix B: Excerpts Related to the Unsustainability of the Road and Trail System from the Final Assessments for the Sierra, Sequoia, and Inyo National Forests

Sequoia National Forest

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The annual cost of performing all needed maintenance activities according to the required cycle for the Sequoia National Forest road system is approximately $5,142,250. In past decades, commercial users maintained a substantial portion of the transportation system in the Sequoia National Forest. With the decrease in vegetation management, fewer roads are being fully maintained. Additionally while maintenance budgets decrease and the maintenance backlog grows, safety standards have become more stringent. The most recent estimate of deferred maintenance needs on the Sequoia National Forest is $49,728,000 for roads and $5,811,090 for all trails (USDA 2012 INFRA)…

Ongoing motorized and non-motorized trail maintenance on the Sequoia National Forest is traditionally funded through appropriations. Appropriated trails funding is expected to remain flat or to slightly decrease over time. At the same time, increased and changing use causes more damage to motorized trails, resulting in greater costs to keep the trails stable. Motorized users are increasingly using larger trail vehicles, and widening motorized trails. Heavier equipment, like graders, is needed more often than in the past to maintain these motorized trails…
When roads and associated drainage-control features contribute flow directly to a natural water body, they become part of the drainage network and are said to be hydrologically-connected. These drainage systems may further increase hydrologic connectivity if they deteriorate because of use, weather, or inadequate maintenance.

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As a result of decreasing budgets, routine maintenance is reduced, maintenance cycles are extended, and selective repairs are made to ensure public safety and prevent significant resource damage. Current and projected funding levels do not cover deferred maintenance, which means that the deferred maintenance backlog grows each year. For example, roads that are to be maintained once every five years may be maintained only once every 10 years. Over time, roads may develop severe public safety or resource damage issues, and may need to be evaluated for closure to public motorized vehicular use. Existing funding for maintenance is insufficient to fully maintain the NFTS. Lower priority roads (ML 1 and 2) are causing deterioration of the roadway. Some roads and trails have become overgrown with brush and trees and are impassible to vehicular traffic …

Road and trail maintenance on the Sequoia National Forest is essential for managing recreation opportunities. While recreation demand in the future is expected to increase, anticipated appropriated funding will not be enough to fully fund the operation and maintenance of roads and trails. Not performing the routine annual maintenance on time may increase the amount of deferred maintenance. As a result, fewer of the roads and trails will be fully maintained to standard. Roads and trails not receiving proper maintenance will inevitably be affected. Both public and administrative accesses are expected to continue to be degraded, and that will encourage road and trail decommissioning.

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With fewer commercial users maintaining portions of the NFTS compared to the past and declining federal budgets, the Sequoia National Forest has had and is expected to continue to have challenges maintaining the road system to safety and environmental standards, resulting in a backlog of deferred maintenance. At the same time, public use of forest roads has grown steadily in recent years, and driving for pleasure is one of the main activities on Forest Service land.

… As population grows and urban development expands, use of forest trails is expected to increase, as is the demand for both motorized and non-motorized recreation opportunities. At the same time, federal budgets are expected to continue to decline, challenging the forest's ability to operate and maintain trails…

Road and trail maintenance in the Sequoia National Forest are essential for managing recreation opportunities. Increasing use, coupled with decreasing maintenance could lead to erosion and deterioration of roads and trails, closures due to safety concerns and deferred maintenance needs, and subsequent loss of recreation opportunities and quality of experience.

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Forest roads are one of the major sources of sediment on national forests in California, including the Sequoia National Forest. Road decommissioning is the most effective approach to reducing road-related sediment delivery. However, for roads necessary for forest management and recreation, road maintenance including storm proofing, is the primary means of controlling erosion. Declining budgets have reduced the ability of the national forests in California to maintain and stormproof roads.
Roads are likely to be substantial sources of sediment in some actively-managed forested watersheds with overall low sediment yields.

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Alteration of flow paths from roads can affect meadow and wetland function, with the effects extending far beyond the area road itself (Hunsaker et al. 2013).

<u>Sierra National Forest</u>

Page 43
Forest roads are one of the major sources of sediment on national forests in California. Road decommissioning is the most effective approach to reducing road-related sediment delivery. However, for roads necessary for forest management and recreation, road maintenance including storm proofing, is the primary means of controlling erosion. Declining budgets have reduced the ability of the national forests in California to maintain and stormproof roads.

On the Sierra NF, there is an estimated 1,969 miles of road across just over 1.3 million acres. The estimated sediment yield from these roads is between 0.01 and 0.09 tons per acre per year. Estimated road-related sediment yields overlap the low end of the range of reservoir sediment yields. This comparison indicates that roads are likely to be substantial sources of sediment in some actively-managed forested watersheds with overall low sediment yields.

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Alteration of flow paths from roads can affect meadow and wetland function, with the effects extending far beyond the area of the road itself (Hunsaker et al. 2013).

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A condition of the overall road system is difficult to quantify; there are no detailed forest-level road condition surveys. General federal funds for repairing and maintaining roads have decreased approximately five percent each year for over 10 years. The road work done by commercial uses has been reduced by approximately 80 percent in the last 15 years. As a result of these short falls the forest road system has dropped from well maintained at the designated maintenance level to marginally maintained at the designated maintenance level.

Passenger cars roads have more pot holes, and the pavement is not repaired in a timely manner. Maintenance on these ML3-4 roads is for safe access and resource protection. High clearance roads have become much rougher than originally expected. Typically, road maintenance is to remedy watershed or water quality concerns. Much of this road mileage is becoming too brushy for passage. The public's expectation for mobility on national forest roads has been lowered as a result of these constraints…

It is expected that the national forest road system will begin to deteriorate at a faster pace. Direct road maintenance funding has been decreasing for over ten years while recreational uses of the road system have not diminished. Commercial use of the roads has been reduced by 80 percent over ten years. These commercial interests historically maintained the roads. These limited funds are directed mostly to passenger car roads (ML3-4). Less work is being done on high clearance vehicle roads (ML2). The ML2 roads are the primary access into forest activities. Recreation access will be reduced as roads become brushed over and washed out. Restoration and vegetation projects will become more expensive as more project funds are diverted to provide for the cost of project access.

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The deferred maintenance for road infrastructure on the Sierra NF is approximately $100,000,000 (Sierra NF Travel Management DEIS). The Sierra NF receives approximately $425,000 annually to operate and maintain roads, and the estimated funding needed to maintain roads to standard is approximately $1,600,000 (Sierra NF Travel Management FEIS). Over the past several years, the Sierra NF has had funding to maintain only about 25 percent of its road system to safety and environmental standards.

<u>Inyo National Forest</u>

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The current base funding level for appropriated road construction and maintenance funds is $545,000, which is expected to remain flat or decrease. An estimated $1.7 million would be needed annually to maintain the Inyo NF's road system to standard. Due to the annual shortfall in road maintenance dollars, the deferred maintenance backlog increases each year. In 2009, an estimated backlog of about $26.9 million existed for the Inyo NF road system (USFS 2009). In addition, because of the annual nature of federal budgets, the forest is unable to plan for and accomplish larger-scale projects, such as road resurfacing or bridge replacement. Competitive funds for such projects are largely unpredictable.

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Little routine maintenance is currently being performed on the forest with the exception of a few high-use roads. Other road maintenance is generally limited to emergency repairs to address safety issues or critical resource damage.

Funding for trails was relatively high in the late 1980s and early 1990s but has since been reduced dramatically. The current base funding level for appropriated trail construction and maintenance funds is $115,000, which is expected to remain flat or decrease. An estimated $1.1 million would be needed annually to maintain the forest's trail system to standard. Due to the annual shortfall in trail maintenance dollars needed, the deferred maintenance backlog increases each year. The current backlog is about $16.5 million. Funding for larger-scale trails projects is also subject to competition and largely unpredictable.

At the same time, increasing and changing use of trails is causing more damage to motorized trails, resulting in greater costs to keep trails stable. Motorized users are increasingly using larger vehicles and more trails are being used by motorcycles, resulting in the need for heavier and more costly equipment to maintain these motorized trails…

Climate change can influence the transportation system due to increased flooding, which could result in additional transportation restrictions as a result of landslides and slope failures. Conversely, less snow on roads from climate change may result in increased winter season accessibility. However, it is expected that more frequent loss of access to parts of the forest would be faced with increased climate variability (Duvair et al. 2002).