September 8, 2015

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Re: Comments on draft viability analyses for great gray owl and Gilman's goldenbush

Dear Al:

We appreciate the opportunity to offer comments on early drafts of the viability analyses for great gray owl and Gilman's goldenbush. We understand the viability analyses you shared with us are a work in progress and agree that it is a daunting task to complete such analyses for so many species. We offer the comments below and attached in the spirit of learning and exchanging ideas about how to most effectively address the new planning rule. Several of us looked at the analysis documents from two perspectives – the biology for the species and the requirements of the planning rule. Comments on these aspects are embedded in the attached draft analyses. We are also including a separate review of climate change related concerns for these species.

We identified several overarching concerns with these early drafts related to specificity of ecological conditions and stressors, how plan components are defined, and the viability analysis itself that we highlight below.

Lack of Specificity Makes It Difficult To Evaluate Viability

We did not think the analysis described in the current drafts was sufficiently complete to establish whether or not the draft plans under evaluation contained plan components that would "provide the ecological conditions necessary to…maintain a viable population of each species of conservation concern within the plan area." Each viability analysis should clearly define the ecological conditions necessary to ensure viability. The analysis should also identify the specific stressors that may affect the necessary ecological conditions, and how and the magnitude to which each specific stressor acts on the necessary ecological conditions. This set of information can be used to create a "crosswalk" to connect the ecological conditions and stressors to plan components that ensure the ecological conditions are provided and/or stressors are adequately mitigated

We used a set of matrices, as recommended in *Planning for Diversity* (http://www.defenders.org/sites/default/files/publications/planning-for-diversity.pdf), to create such a crosswalk between ecological conditions, stressors and plan components for great gray owl. We used information provided in the draft write up for great gray owl to develop the attached spreadsheet as an example of how to use this tool. The italicized text in the spreadsheet indicates information that should be developed or refined. We recommend that you use the spreadsheet as a tool to support the evaluation of other species of conservation concern. We also think that this spreadsheet combines well with the narrative template that you are following.

As a specific example, we determined through the use of this tool that the stressor "forestry practices" was not sufficiently described to evaluate the impact of this stressor on this species. The draft analysis states that forestry practices degrade great gray owl habitat but does not define the specific forestry practices or the specific necessary ecological condition being affected by the stressor. This makes it extremely difficult to connect the plan components to any necessary ecological conditions or stressors. This is turn makes it even more difficult to demonstrate that the plan components ensure viability. Increasing specificity does not necessitate much additional work, for example, one could further define this stressor as, "Forestry practices that remove trees (except for cedar and Jeffrey pine) greater than 24 inches dbh and thinning nest stands (typically 50 acres in size) to below 65% canopy cover have the potential to degrade great gray owl nesting habitat."

The management guidance to maintain the specific ecological conditions necessary for viability or mitigate the stressors that affect them also suffers from lack of specificity. For instance, there are no plan components referenced that protect large diameter trees and snags or that maintain sufficient canopy cover in great gray owl nest stands, yet these are essential ecological conditions to great gray owl persistence and viability. We also note that desired conditions are aspirational; therefore, by definition they alone cannot be relied on to maintain viability. Specific standards or guidelines should be created to ensure that each of the significant limiting ecological conditions necessary for viability are adequately and appropriately provided and the significant stressors acting on the species or its habitat are sufficiently mitigated, particularly for those stressors resulting from Forest Service management.

There is an interim step that should be completed in the viability analysis, between defining the ecosystem components that provide ecosystem integrity and contribute to viability and the development of species-specific plan components. This interim step is an analysis of the ability of the ecosystem components alone to provide for species viability. This step is mentioned in the example viability analyses, but the analysis was not conducted. We believe this step is beneficial to the process because analyzing the adequacies and inadequacies of the ecosystem components to provide for viability creates the rational for and defines the scope of the species-specific components.

Plan Components Do Not Conform To Handbook Definitions In 1909.12

We believe that some of the inadequacies of the plan components to ensure species viability would be addressed if the proposed plan components conformed to the relevant regulatory definitions described in the FSH 1909.12 Chapter 20. An important requirement, which we believe has not been met by many of the components provided in the drafts, is that plan components, "Are written clearly and with clarity of purpose and without ambiguity so that a project's consistency with applicable plan components can be easily determined." (FSH 1909.12, 22.1) Without consistent implementation of plan components that may affect the ecological conditions necessary to ensure species viability from project to project, species viability cannot be ensured.

Analysis of Population Viability

A viable population is defined as, "A population of a species that continues to persist over the long term with sufficient distribution to be resilient and adaptable to stressors and likely future environments." (36 CFR 219.19) The "Viability Analysis Determinations" provided in the examples focus almost entirely on how the plan components mitigate the potential adverse effects of management activities. However, simply minimizing the potential adverse effects of management activities does not ensure population viability. Minimization measures could simply result in subtle but consistent declining trends in distribution and abundance that lead to extirpation from portions or all of the plan area. Ensuring population viability includes providing for long-term persistence, sufficient distribution in the plan area, and resiliency and adaptability to stressors and likely future environments. Each viability analysis should address how the plan components ensure that these important concepts of population viability are provided by the plan components.

We invite more discussion and dialogue with you regarding species of conservation concern and development of the revised forest plans. Please contact Sue Britting (britting@earthlink.net) if you would like to talk more about these comments and related issues.

Sincerely,

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Attachment 1: Comments on addressing climate change for species of conservation concern
Attachment 2: Spreadsheet/tool for evaluating ecological conditions, stressors, and plan components with great gray owl as an example
Attachment 3: Comments ion track changes on draft for great gray owl
Attachment 4: Comments in track changes for Gilman's goldenbush

We urge the Forest Service to more comprehensively assess the threat that climate change poses to species viability, and to make a more intensive effort to develop plan components that will conserve species of conservation concern (SCCs). The sample assessments for great gray owl and for Gilman's goldenbrush are incomplete in their description of the threat that climate change poses to these species, and inadequate in their recommended plan components.

In our view, the key to developing meaningful solutions to the threats posed by climate change is to think both specifically and comprehensively about projected impacts from climate change in an area and what effects they will likely have on wildlife and habitat. It is also very important to examine the interactions between climate change and other threats, like habitat loss, declining water quality, disease, etc. Many resources are available to help managers predict what changes they might need to address and what species may be vulnerable[1] to climate change: for instance, detailed climate projections and impacts of focal resources have been described at length by Kerschner (2014). Furthermore, the great grey owl, has been assessed and found to be "moderately vulnerable" to climate change both within the Sierra Nevada mountains (Siegel et al. 2014) and statewide (Gardali et al. 2012). While there does not seem to be an available climate vulnerability assessment for *Ericameria gilmanii*, the plant's status as a globally critically imperiled (G1) species should automatically consideration of the potential threat to the species from a changing climate.

We also urge the Forest Service to articulate plan components (preferably standards) that serve as adaptation strategies. Depending on the nature and urgency of the threats and the specific vulnerabilities of the species or habitat in question, these strategies can take one of three forms, or entail a combination of them:

a) ***Resistance-oriented strategies*** intended to **reduce the exposure** of a species or habitat to climate-related stresses. For instance, in the face of higher temperatures it may be possible to reduce the exposure experienced by a species of concern by restoring riparian cover to minimize changes in stream temperatures or shading nests to reduce incubation temperatures. This might also involve giving extra conservation attention to likely climate "refugia," or areas likely to experience less change than the surrounding landscape (e.g., springs fed by cold groundwater, north-facing slopes, etc.). It may also be possible to reduce the exposure experienced by a species or habitat by ameliorating a non-climate threat that **generates the same ecological consequence** as a climate factor. The adaptation strategy should specify how it will address the ecological consequence generated by the climate factor. For example, both dams and decreased snow pack might alter the hydrology of a stream system and decrease stream flow. An adaptation strategy could include timed releases from the dam (non-climate factor) during low flow periods caused by decreased snow pack and early melting (climate factor).

b) ***Resilience-oriented strategies*** intended to **reduce the sensitivity** of a species or habitat, improving its ability to "bounce back" from a climate-related stress. Many of these strategies will include habitat protection, restoration, management and other activities that improve the

[1] "Vulnerability" is a function of **exposure** to climate change – the magnitude, intensity and duration of the climate changes experienced, the **sensitivity** of the species or community to these changes, and the **capacity of the system to adapt** to these change.

overall health of the system, for instance to reduce the likelihood of catastrophic fire, improve wetland function, alleviate competition from invasive species, add artificial nest boxes to boost reproduction, etc. Resilience-oriented strategies may also aim to reduce the conservation target's sensitivity to the climate factor, by including more climate-tolerant ecotypes or species in habitat restoration efforts.

c) ***Transformation-oriented strategies*** intended to increase the **adaptive capacity** of the system by allowing it to respond in new ways. These might include increasing connectivity to allow species to shift their ranges, or proactively conserving areas that are modeled to be likely future range of a target species or habitat. Facilitating the transition of a freshwater wetland to a saltmarsh, while restoring additional freshwater wetland farther inland, is an example of a transformation strategy for sea level rise. More aggressive transformation strategies, like moving species to areas outside of their historic range, are considered more controversial and require careful consideration.

We hope these comments will help the Forest Service improve the climate change considerations in the Sierra Nevada SCC viability analyses.

References cited:

Gardali, T., N. E. Seavy, R. T. DiGaudio, and L. A. Comrack.2012. A climate change vulnerability assessment of California’s at-risk birds. *PLoS ONE* 7(3):e29507. http://dx.doi.org/10.1371/journal.pone.0029507

Kerschner, J. M. (editor). 2014. A Climate Change Vulnerability Assessment for Focal Resources of the Sierra Nevada. Version 1.0. EcoAdapt, Bainbridge Island, WA. 410 pp. http://www.ecoadapt.org/data/library-documents/EcoAdapt_CALCC_Sierra%20Nevada%20Adaptation%20Strategies_26Feb2014.pdf

Siegel, R. B., P. Pyle, J. H. Thorne, A. J. Holguin, C. A. Howell, S. Stock, and M. W. Tingley. 2014. Vulnerability of birds to climate change in California's Sierra Nevada. *Avian Conservation and Ecology* **9**(1): 7. http://dx.doi.org/10.5751/ACE-00658-090107

Attachment 2: GGO and assessment tool/spreadsheet (Excel file included in with original comment letter)

GREAT GRAY OWL - cross walk of ecological conditions, stressors and plan components presented in the draft viability analysis provided to us by the Forest Service	*Italicized language describes information that should be added the viability analysis and possibly the forest plan if not presently included*			
Ecological conditions	Desired Conditions	Objectives	Monitoring	Probabiliy of desired conditions being achieved & rationale (including components with adverse effects)
1. (site) Large, broken-topped snags, usually greater than 24 inches in diameter, within 600 to 845 feet of meadows or large meadow complexes (e.g. >26 acres), and within forest canopy over of at least 60% canopy closure immediately around the nest site.	GTR 220 management guidelines *(unclear what the "guidelines" are; identify the desired conditions in the draft plan that are specific to these ecological conditions*)			
2. (site) Height of vegetation in meadows appropriate for prey species	Meadow habitat conservation and restoration. *Specify height of vegetation in meadow* s			
3. (site) Nest site situated in home range 61 ha in females and 20 ha in males during the breeding season, and 2457 ha for females and 2113 ha for males during winter	*Identify the amount of meadow habitat and/or distance from nest to which desired meadow conditions apply (map).*			
4. (landscape) Number of home ranges for a viable population	*Determine desired number of suitable home ranges*			
5. Minimal human disturbance within x distance of nest site	*??*			Species' probability of persistence and distribution
				?????????????????????????

Stressors (and which desired conditions they affect)	Standards/suitability	Guidelines	Other content	Plan components that promote stressors
Forestry practices (1,4,5)	Protect nests	*Define what "protection" means.*		*Does NRV require forestry practices in owl habitat?*
	Conduct/document surveys			
Fire suppression (1,4,5)	Protect nests	*Define what "protection" means.*		*How much habitat is a priority for fire suppression?*
	Conduct/document surveys	Minimize ground-disturbing impacts in senstive habitat. *Include map of this habitat.*		
Exurban development (3,5)			Coordination requirement with local planning	
Recreation (5)	Protect nests	*Define what "protection" means.*		*Desired expansion of campgrounds in owl nesting habitat?*
	Conduct/document surveys			
Grazing (2)	Utilization standards (*must be specified in the plan).*	Maintain height commensurate with site capability and habitat needs of prey species *(as described in the desired condition)*		*How much grazing is planned in sensitive habitat?*
	Conduct/document surveys			
Road use (5)				
West Nile virus (4)			Ongoing monitoring	
Inbreeding depression due to small population size, limited genetic diversity, and limited migration potential (4)				
Stochastic extinction due to small population size and increasing aridity and temperatures due to climate change (4)				

Attachment 3: Comments in track changes on draft for great gray owl

Viability Analysis Example

Note to Forest Service: The text in yellow highlight below was used to develop the accompanying spreadsheet on ecological conditions, stressors and plan components. This spreadsheet is intended to help develop and track plan components to address the necessary ecological conditions for the species and other components to reduce stressors.

Forest(s): Sierra and Sequoia National Forests

Species Common Name: **Great Gray Owl** Scientific Name: ***Strix nebulosa***

Species and Population Description in the Plan Area: *Describe the species range and abundance. Describe the population trend of the species or its habitat in the plan area.* Great gray owls inhabit forested regions of the northern and central United States and Canada, extending as far south as the southern central Sierra Nevada Mountains. Great gray owls are regarded as locally rare throughout their range in USFS Region 5 (Small 1994; Bull and Duncan 1993; Fix and Bezener 2000; Steel et al. 2011). No more than 100-200 individuals have been estimated in California since 1980 (Hull et al. 2010), and only 80 were estimated in 2006 (Maurer 2006). Yosemite National Park (YNP) estimates that it has 65% of the nesting owls in California in what is described as the Sierra Nevada population.

Recent surveys and genetic sampling of the Sierra Nevada great gray owl population indicates that this geographically-isolated population of a few hundred individuals in the central Sierra Nevada constitutes a genetically-unique population that may warrant formal recognition as a sub-species (Hull et al. 2010). The most southern extent of this species is found on the Sequoia NF which is at the edge of the Sierra Nevada population with 1 confirmed nest. The majority of owls within the plan area is known from the Sierra National Forest with a population estimated at 10-20, although extensive surveys have not be conducted to accurately assess the population. A landscape habitat suitability model used in Yosemite National Park highlights that high suitability GGO areas is rare within YNP with only 0.8% of the landscape rated in the highest 20% suitability class (Keane 2011).

Habitat Description and Analysis. *Describe ~~key habitat attributes important for long-term persistence~~ ecological conditions necessary to maintain a viable population within the plan area. Consider spatial scales at which the species selects habitat and which are important for managers to consider in maintaining long term persistence*. Great gray owls in the Sierra Nevada typically inhabit densely vegetated wet or moist meadows marginated by old growth coniferous forests (Hayward 2007). Hayward (2007) suggests that nesting habitat and prey availability are the two primary limiting factors for this owl (Hayward, 2007). The owls forage in wet or moist meadows and occasionally in other open areas such as clear-cuts and thinning units feeding mostly on small rodents with voles being their most important food source (Greene 1995). Height of vegetation in meadows can be strongly correlated with some prey species though it varies across habitat types such as wet or dry meadows.

The key ecological characteristics that great grey owl depends on are high canopy cover (greater than 65 percent) nest stands in mixed conifer, red fir, or lodgepole pine forest adjacent to meadows (greater than 25 acres in size) with a high rodent prey base and high quality meadow vegetation throughout the breeding season (Winter 1982, Winter 1986, and Green 1995) and all forested lands within 900 feet of meadow edges (Winter 1982). One of the best predictors of great gray owl presence and reproduction is vole abundance (Green 1995, Winter 1986). A recent study found a negative correlation between grazing and vole abundance in wet meadows within great gray owl territories in the Sierra Nevada and recommends not grazing cattle when managing for vole habitat (Kalinowski et al. 2014) "This species forages by sitting and waiting on low perches over meadow vegetation. It frequently perches on the large branches that extend up from fallen trees that along the meadow edge." (Loffland and Siegel 2012.

Comment [B1]: BIOLOGICAL: A GGO was killed this summer by a vehicle on the Inyo. The presence of GGO on the Inyo should be recognized.

Comment [B2]: The evaluation should not be limited to the plan area. We note that the narrative appropriately includes the broader scale context. We suggest changing the outline to make this clearer.

It is also unclear what the "plan area" is defined as. We think there are three plan areas; one for each NF, since each NF will have its own plan. See below for other places where the use of "plan area" is inconsistent with this.

Comment [B3]: BIOLOGICAL: Hull et al. (2014) formally described the Sierra population a subspecies (*Strix nebulosa yosemitensis*).

Comment [B4]: This should be addressed as missing information and the need to undertake surveys should be evaluated.

Comment [B5]: The outline should be revised to use the specific language from 219.9. SCC are to be evaluated to determine if the plan components "provide the ecological conditions necessary to…maintain a viable population of each species of conservation concern within the plan area."

Comment [B6]: BIOLOGICAL: This paragraph contains additional ecological information provided in our scoping comments.

Viability Analysis Example

Note to Forest Service: The text in yellow highlight below was used to develop the accompanying spreadsheet on ecological conditions, stressors and plan components. This spreadsheet is intended to help develop and track plan components to address the necessary ecological conditions for the species and other components to reduce stressors.

Winter (1986) found that a majority of great gray owls nest within 600 feet of meadows, or large meadow complexes (e.g. >26 acres), but meadows as small at 10 acres will support infrequent breeding (USDA 2000) and all nests have been found within 845 feet of meadows. Nests and roost stands are generally in excess of 60% canopy closure. Great gray owls nest in large, broken-topped snags, usually greater than 24 inches in diameter (Greene 1995; Beck and Winter 2000). They do not build their own nests and have been known to use old hawk or eagle nests (Zeiner et al,1990).

Nest habitat requires large, broken-topped snags, usually greater than 24 inches in diameter, within 600 to 845 feet of meadows or large meadow complexes (e.g. >26 acres), and within forest canopy over of at least 60% canopy closure immediately around the nest site. Forage prey species are often found within wet meadows and meadow complexes (e.g. >26 acres).

Home Range: The species' mean home-range size in the Sierra Nevada during a radio-tagging study was estimated at 61 ha in females and 20 ha in males during the breeding season, and 2457 ha for females and 2113 ha for males during winter (Van Riper and van Wagtendonk 2006).

Plan Area: The species requires the maintenance of and or restoration of key habitat characteristics particularly larger diameter nest trees associated with late seral forests with dense canopy and adjacent to meadows with abundant prey availability. Because of the potentially distinct population, their habitat needs to be protected across the two Forests to help assure the reproductive persistence in the plan area over the long-term.

Stressors: *Describe the major stressors that are currently acting on the species and/or its habitat and leading to the concern regarding species persistence*. This species' small, isolated population is susceptible to long-term ~~persistence in~~extirpation from the plan area. Some important stressors include:

- Degradation or loss of mid-elevation coniferous habitats and meadows and meadow complexes at least 26 acres in size are thought to have degraded great gray owl habitat as a result of forestry practices, fire suppression, and exurban development, though much of the restricted Sierra Nevada population occurs within Yosemite National Park, well protected from at least some of these threats (Bull Duncan 1993, Siegel and DeSante 1999, Kotliar et al. 2002, Maurer 2006, Bunn et al. 2007, Steel et al. 2011). In California, the loss of mature forest habitat due to logging and overgrazing of meadows have been identified as the primary causes for the species' decline (Winter 1986; California Partners in Flight 2002).

- Disturbance related to campgrounds and their development has been documented, as well as disturbance from grazing and recreational activity.

- Collisions with vehicles on roads around occupied meadows are substantial threats, in part because the population is so small (Bull and Duncan 1993, Maurer 2006, Bunn et al. 2007, Steel et al. 2011). One adult GGO were killed on highways on or near the Sierra National Forest and another GGO was thought to be injured by a vehicle collision and was found on the Sierra National Forest.

- The recent range expansion of West Nile Virus into California in 2003 poses a significant risk factor for the relatively small GGOW's in the Sierra Nevada.

Comment [B7]: BIOLOGICAL: New paper published (Wu et al. 2015; http://onlinelibrary.wiley.com/doi/10.1002/jwmg.910/full) on Sierra GGO nests, nest sites, and nest stands suggests that most of this should be updated with that information. For instance, elevational gradient is much broader than previously described, 20% of nest trees were farther than 720m from meadows, nest trees averaged 40 inches dbh and used living trees (25%), selected against ponderosa, Doug fir, sugar pine, Jeffery pine, and cedar, 2-acre nest plots averaged 85% canopy cover, and 50-acre nest stands averaged 80% canopy cover.

Comment [B8]: It is unclear what is meant by the "plan area" since three forest plans are being addressed simultaneously.

Comment [B9]: BIOLOGICAL: The southern Sierra population has officially been designated a subspecies (Hull et al. 2014).

Comment [B10]: The 2012 Rule and Directives require LRMPs to maintain viable populations of each SCC. In addition to "long-term persistence," the concept of viability includes "sufficient distribution to be resilient and adaptable to stressors and likely future environments." (36 CFR 219.19; FSH 1909.12 Page 80) This should be reflected throughout the "viability" analysis for each at risk species.

Comment [B11]: These stressors should be described in greater detail to provide the foundation for the development of plan components to reduce their impact.

Comment [B12]: BIOLOGICAL: The specific disturbances from grazing and recreational activities should be identified. For instance, disturbance from campgrounds is due to the presence of people (van Riper et al. 2013; http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1133&context=ncfwrustaff), but disturbance from grazing results in habitat degradation that contributes to reduced prey abundance. Other recreational activities such as OHVs could also degrade meadow habitat.

Note to Forest Service: The text in yellow highlight below was used to develop the accompanying spreadsheet on ecological conditions, stressors and plan components. This spreadsheet is intended to help develop and track plan components to address the necessary ecological conditions for the species and other components to reduce stressors.

- Inbreeding depression due to small population size, limited genetic diversity, and limited migration potential (Hull et al. 2010).
- Stochastic extinction due to small population size and increasing aridity and temperatures due to climate change (Hull et al. 2010).

Ecosystem (Coarse Filter) that Contribute to Persistence. *List and discuss the plan components that help ensure the important habitat attributes are provided to such an extent that the species will persist over the long-term.*

Desired Conditions

- Forest management that maintains forest ecosystem integrity and resiliency, including large tree conservation and greater forest resilience within the GTR 220 management guidelines.
- Meadow habitat conservation and restoration, surrounded by mature and old-age coniferous forest

Objectives

Species-specific (Fine Filter) Plan Components that Contribute to Persistence: *When analysis indicates that coarse filter plan components for ecosystem integrity would not be adequate to provide for species persistence in the plan area, identify the species-specific plan components designed to ensure that conditions necessary for long-term population persistence are provided.*

Standards

- (SNF, SQNF)- Protect nests of great gray owls, peregrine falcons and bald eagles, and dens of the Sierra Nevada red fox, as well as habitat immediately surrounding those nests and dens, as defined by the Regional Forester.
- (SNF, SQNF) Maximum utilization standards for livestock

Guidelines

- (SNF, SQNF) In order to provide adequate forage habitat for great gray owls, maintain herbaceous vegetation at a height commensurate with site capability and habitat needs of prey species in areas of potential great gray owl meadow foraging areas within 0.5 mile of known great gray owl nests,
- (SNF, SQNF) Fire suppression techniques that minimize ground disturbance impacts should be used in sensitive habitat of at-risk species, with guidance provided by a resource advisor and considering the safety of people. ~~Locations of key habitat areas~~Sensitive habitat of at-risk species should be provided in current fire decision support systems (e.g. the Wildland Fire Decision Support System) as appropriate.
- (SNF, SQNF) Conduct field surveys for TEP and SCC (at risk) plant species early enough in the NEPA planning process that projects can be designed to conserve and enhance TEP/SCC plants

Comment [B13]: The specific desired condition statements from the plan should be quoted here with the reference numbering system used by the plan, e.g., DC-1, etc.

According to the directives, DCs: "Describe what is desired for ecosystem integrity." Neither of these statements describe what is desired for meadow or old forests surrounding meadows that would ensure GGO viability.

GTR 220 is a relatively conceptual "management strategy." We suggest you include the specific "guidelines" from GRT 220 that provide forest resilience and maintain ecosystem integrity and GGO viability. These statements should then be moved to the "guideline" plan component.

"Conservation" and "restoration" are not desired conditions as defined by the planning rule.

Comment [B14]: There should be an actual analysis of integrity, and this could be tiered to it.

Comment [B15]: This should be defined. Recall that GGO require >60% canopy cover forest with many large trees (i.e., >24 inches dbh) for nesting. These terms are ambiguous, their meaning would differ from manager to manager, which would not ensure adequate amounts of >60% canopy cover habitat are provided in proximity to high quality foraging meadows.

Comment [B16]: BIOLOGICAL: This species would benefit from meadow restoration to support improved habitat conditions in moist meadows, development of nest structures, and creation of pouncing perches along meadow margins. See Loffland and Siegel 2012 and Wu et al. 2015 for management recommendations.

Comment [B17]: Some rationale is needed for why ecosystem components are insufficient.

Comment [B18]: The specific standards from the plan should be quoted here with the reference numbering system used by the plan, e.g., S-1, etc.

Comment [B19]: "Protect" must be defined for this to satisfy the definition of a standard.

Comment [B20]: This must be defined for this to satisfy the definition of a standard. The analysis must address how the specific utilization standards provide for an adequate abundance of gophers and ...

Comment [B21]: Specific guidelines should be provided for this as per the directives ("should clearly describe the circumstances and manner in which the guidelines apply.") If not provided, the ...

Comment [B22]: Locations where plan components apply must be identified in the plan or the process/criteria for identifying them later.

Comment [B23]: This is a standard (a required action). It is written for plant species though and not for GGO.

Note to Forest Service: The text in yellow highlight below was used to develop the accompanying spreadsheet on ecological conditions, stressors and plan components. This spreadsheet is intended to help develop and track plan components to address the necessary ecological conditions for the species and other components to reduce stressors.

and their habitat. Conduct surveys as appropriate according to accepted professional standards (e.g. FSH 2609.26.11). If additional field surveys are to be conducted as part of project implementation, survey results must be documented in the project file.

Viability Analysis Determination: Great gray owls are not only a Species of Conservation Concern but also listed as a California State Endangered Species. The likelihood that the Sierra Nevada GGO's could be a distinct sub-species based on recent genetic studies increases its conservation importance and risk of population loss across its range from stressors. Though it can pose a significant risk to this population, West Nile Virus is not a limiting factor that the Forest Service has the capability to influence other than continue monitoring all avian species for unusual signs of bird mortality. While vehicle induced mortality is a concern, the Forest Service does not have the authority for traffic speed on major high speed highways that traverse these Forests. Roads that the Forest Service does have authority for generally do not post speed limits due to the type of roads and lack of personnel to enforce. However, owl vehicle collisions could still occur on Forest roads and should be evaluated on a site-specific basis should mortality be found to be associated with them in the future.

Other than current population size and extent, the two limiting factors for GGO are nesting habitat and prey availability. While grazing can impact prey availability, fine filter plan components including maximum utilization and stubble height standards substantially reduces risks to foraging habitat. Threats to habitat and nesting are magnified by increasing numbers of large fires which because of their size and intensity, increases the potential for significant loss of larger diameter trees, nests and potentially the juxtaposition of forest/meadow interface that this species depends upon. Reducing the potential for crown fires that are outside of the historic range of natural variability could benefit this population. By protecting important large diameter trees and snags, meadow/coniferous forest interface, and nest sites as characterized in Alternatives B, C and D it is my conclusion that the plan components for all action Alternatives would provide the ecological conditions necessary to maintain a viable population ~~for the persistence of~~ this species in the Sierra and Sequoia National Forest plan area.

Capability of the Plan. *Describe if and why it is beyond the authority of the Forest Service or not within the inherent capability of the plan area to maintain or restore the ecological conditions to maintain a viable population of a SCC in the plan area.* Not Applicable.

Best Available Scientific References:

Beck, T.W. and J. Winter. 2000. Survey protocol for the great gray owl in the Sierra Nevada of California. Prepared for USDA Forest Service, Pacific Southwest Region,Vallejo, California. Pp.38.

Bull, E. L. and J. R. Duncan. 1993. Great Gray Owl (*Strix nebulosa*). *The Birds of North America Online* (A. Poole, ed.). Ithaca: Cornell Lab of Ornithology [accessed February 20, 2011]. Available from http://bna.birds.cornell.edu/bna/species/041.

Bunn, D., A. Mummert, M. Hoshovsky, K. Gilardi, and S. Shanks. 2007. *California wildlife: cConservation challenges. California's wildlife action plan.* California Department of Fish and Game, Sacramento, CA.

Fix, D. and A. Bezener. 2000. *Birds of northern California*. Lone Pine Publishing, Auburn, WA.

Comment [B24]: This is not a viability analysis. It is mitigation analysis. There is no assessment of probability of persistence.

Comment [B25]: The plan should address the threats of inbreeding depression and climate change. This could be accomplished by ensuring the population does not decline, suggested by Hull et al. (2010) and focusing meadow restoration efforts at the higher elevations at which the species occurs.

Comment [B26]: Need to define, biologically, how the maximum utilization standards provide for adequate prey abundance.

Comment [B27]: The plan components that do this need to be stated and discussed in the sections above.

Comment [B28]: The plan components that do this need to be stated and discussed in the sections above. Reducing the potential for crown fire can be accomplished using a variety of methods, e.g., thinning and managed fire. In the sections above, forestry practices were defined as a stressor and the species requires high canopy cover forests for nesting. Depending on the intensity, logging or thinning could be a stressor that reduces viability.

Comment [B29]: The standards or guidelines that protect these need to be discussed and cited above.

Comment [B30]: This is the finding required by the planning rule (219.9).

Comment [B31]: These are two separate plan areas since there will be separate plans for each NF.

Viability Analysis Example

Note to Forest Service: The text in yellow highlight below was used to develop the accompanying spreadsheet on ecological conditions, stressors and plan components. This spreadsheet is intended to help develop and track plan components to address the necessary ecological conditions for the species and other components to reduce stressors.

Greene, C. 1995. Habitat requirements of Great Gray Owls in the Central Sierra Nevada. M.S. thesis, School of Natural Resources and environment. Ann Arbor, MI University of Michigan. 94 p.

Hayward, G. and J. Verner. 2007. RM-GTR-253: Flammulated, boreal, and great gray owls in the United States: A technical conservation assessment. Pp 155-207.

Hull, J. M., J. J. Keane, W. K. Savage, S. A. Godwin, J. A. Shafer, E. P. Jepsen, R. Gerhardt, C. Stermer, and H. B. Ernest. 2010. Range-wide genetic differentiation among North American Great Gray Owls (*Strix nebulosa*) reveals a distinct lineage restricted to the Sierra Nevada, California.

Keane, John J et al. 2011. Conservation and Management of the Great Gray Owl 2007-2009: Assessment of Multiple Stressors and Ecological Limiting Factors. UC Davis.*Molecular Phylogenetics and Evolution* 56(1):212-221.

Kotliar, N. B, S. J. Hejl, R. L. Hutto, V. A. Saab, C. P. Melcher, and M. E. McFadzen. 2002. Effects of fire and post-fire salvage logging on avian communities in conifer-dominated forests of the Western United States. *Studies in Avian Biology* 25:49–64.

Maurer, J. 2006. 2005 Great Gray Owl survey in Yosemite National Park. Unpublished report, Yosemite National Park.

Siegel, R. B. and D. F. DeSante. 1999. *Draft avian conservation plan for the Sierra Nevada Bioregion: a report to California Partners in Flight.* The Institute for Bird Populations, Point Reyes Station, CA.

Small, A. 1994. *California birds: their status and distribution.* Ibis Publishing Co., Vista, CA.

Steel, Z. L., M. L. Bond, R. B. Siegel, and P. Pyle. 2011. Avifauna of Sierra Nevada Network Parks: assessing distribution, abundance, stressors, and conservation opportunities for 145 bird species. Natural Resource Report NPS/SIEN/NRR—2011/XXX (in press). National Park Service, Fort Collins, Colorado.

van Riper, C. III. and J. van Wagtendonk. 2006. Home range characteristics of Great Gray Owls in Yosemite National Park. *Journal of Raptor Research* 40(2):42-53.

Winter, J. 1986. Status, distribution and ecology of the Great Gray Owl (*Strix nebulosa*) in California. M.A. thesis, San Francisco State University, San Francisco, CA.

Prepared by: Greg Schroer, Wildlife Biologist, Forest Plan Revision Team
Joan Friedlander, Wildlife Biologist, Forest Plan Revision Team

Wu, J. X., Siegel, R. B., Loffland, H. L., Tingley, M. W., Stock, S. L., Roberts, K. N., ... & Stermer, C. (2015). Diversity of great gray owl nest sites and nesting habitats in California. *The Journal of Wildlife Management*, *79*(6), 937-947.

Viability Analysis Example

Note to Forest Service: The text in yellow highlight below was used to develop the accompanying spreadsheet on ecological conditions, stressors and plan components. This spreadsheet is intended to help develop and track plan components to address the necessary ecological conditions for the species and other components to reduce stressors.

Loffland, H., & Siegel, R. (2012). Sierra Nevada Bird Observatory.

Hull, J. M., Englis Jr, A., Medley, J. R., Jepsen, E. P., Duncan, J. R., Ernest, H. B., & Keane, J. J. (2014). A New Subspecies of Great Gray Owl (Strix nebulosa) in the Sierra Nevada of California, USA. *Journal of Raptor Research*, *48*(1), 68-77.

Forest(s): **Inyo National Forest**

Species Common Name: **Gilman's goldenbush** Scientific Name: ***Ericameria- gilmanii***

Species and Population Description in the Plan Area: *Describe the species range and abundance. Describe the population trend of the species or its habitat in the plan area.* The species is endemic to California and limited to three localities in Inyo and Kern Counties. A single population of <100 individuals is known from the Forest, , and there was no recruitment of young individuals seen in recent Forest monitoring (CNDDB 2014, Slaton 2015).

Habitat Description and Analysis: *Describe ~~key habitat attributes important for long-term persistence~~ecological conditions necessary to maintain a viable population within ~~in~~ the plan area. Where appropriate, consider the spatial scales which are important for managers to consider in maintaining long term persistence.* ~~Winter (1986) found that a majority of great gray owls nest within 600 feet of meadows, or large meadow.~~ The species occurs on rocky slopes and ridgetops, often with cooler temperatures than surrounding areas, and in undisturbed settings (Baldwin et al. 2012, CNPS Rare Plant Program 2014, Slaton 2015).

Stressors: *Describe the major stressors that are currently acting on the species and/or its habitat and leading to the concern regarding species persistence.* Climate change, including related changes in fire and flooding regimes and non-native plant species invasions may result in the loss of habitat extent and quality for this species. Gilman's goldenbush is adapted to cooler temperatures and does not exhibit fire-adapted traits. Evidence of reproduction following disturbance is extremely limited, and this species does not exhibit high growth rates to out-compete non-native invasive species. In addition, limited distribution (a single occurrence on the Inyo NF), and mining have been identified as potential threats (CNDDB 2014).

Ecosystem (Coarse Filter) Plan Components that Contribute to Persistence: *List and discuss the plan components that ensure the important habitat attributes are provided to such an extent that the species will persist over the long-term.* The desired conditions below outline features of healthy ecosystems that could support Gilman's goldenbush. A desired condition to keep fire regimes within the NRV (not too much and not too little fire, and of desired severity) would benefit this species, as would the guideline to ensure some project areas are left undisturbed.

Desired Conditions (sagebrush~~)~~)

- The sagebrush type has a diversity of age classes, stand structure, cover classes and understory composition.
- Sagebrush ecosystems are resilient to fire, disturbances (e.g., grazing, recreation), invasive species (including cheatgrass) and climate change.
- Grazed areas have or are trending toward satisfactory soils condition, functional hydrology and biotic integrity. Sagebrush ecosystems contain all key elements and conditions, including sagebrush regeneration and recruitment, ecosystem productivity, perennial grass cover, biological soil crusts and symbiotic fungal associations.
- Open sagebrush habitat with no overstory trees, such as pinyon pine, juniper or Jeffrey pine, provides habitat connectivity.. Fire occurs within the natural range of variation, or in small extents, as a natural process, limiting encroaching conifer trees.

Comment [B1]: BIOLOGICAL: Not clear if this is the only population in existence for this species. This should be clearly stated. If there re other populations, they should be discussed. If no other populations then the population on the Inyo is not only important for viability in the plan area, but for the continued existence of the species.

Comment [B2]: BIOLOGICAL: Define the vegetation types with it occurs with. Could refer to: "Subalpine coniferous forest, upper montane coniferous forest, carbonate or granitic soils, rocky (Skinner, 1997)." It would be good to include an elevation range for the species too.

Comment [B3]: The outline should be revised to use the specific language from 219.9. SCC are to be evaluated to determine if the plan components "provide the ecological conditions necessary to…maintain a viable population of each species of conservation concern within the plan area."

Comment [B4]: BIOLOGICAL: Due to small population, stochasticity should be identified as a significant threat.

Comment [B5]: What human activities contribute to this? If the purpose of this "viability analysis" is to determine plan components, then there needs to be discussion of how management of the plan area is a potential stressor that could be managed.

Comment [B6]: BIOLOGICAL: If this is the case, wouldn't fire be a potential stressor?

Comment [B7]: If there is a desired condition that does this, what is it?

Comment [B8]: BIOLOGICAL: If this species is associated with the sagebrush vegetation type, that should be clear in Habitat Description and Analysis section. Also, if this species occurs in other vegetation types, that should be clear in the Habitat Description section as well. Due to the scale at which this extremely rare species occurs, it does not seem that these desired ...

Comment [B9]: This is too vague; these conditions need to be defined for "each type."

Comment [B10]: Describe the conditions that define "resilient."

Comment [B11]: This a good starting point for defining "satisfactory," "functional," and "integri ...

Comment [B12]: If competition with overstory trees for light and space is an issue, it should be ...

Comment [B13]: This is a good idea, but the background for connectivity should be provided in the habitat section above.

Comment [B14]: The NRV should be characterized in more detail and discussed in reference to the needs of this species.

Comment [B15]: Since it is believed this species is not fire-adapted, then this seems to be a desired condition that may not be compatible with specie ...

Guidelines (Eastside Vegetation)

- Restoration activities should be conducted during the appropriate time of year, and on appropriate slopes, aspects and soil types to ensure native species recovery and to minimize non-native species introductions.
- If available and needed to support restoration activities, projects should use native species seed appropriate for the ecological unit to restore the desired native species composition of the area. Consider the effects of climate change in selecting appropriate seed.
- Give priority to ~~Projects in sagebrush should prioritize~~ restoration treatment to remove trees from wooded shrublands, which include recent expansion areas of pinyon and juniper into sagebrush ecosystems and other adjacent shrublands.
- Include appropriately sized patches of undisturbed vegetation in project designs to minimize non-native species spread and maximize native species regeneration.

Species-specific (Fine filter) Plan Components that Contribute to Persistence: *When analysis indicates that coarse filter plan components for ecosystem integrity would not themselves be adequate to provide for persistence of one or more at-risk species, list and discuss the species-specific plan components for those individual species designed to ensure that conditions necessary for long-term population persistence are provided.*

The following components apply because Gilman's goldenbush occurs on limestone substrates, an identified special habitat.

Desired Conditions (Special Habitats)

- The composition, diversity, and structure of special habitats are resilient to disturbances such as recreational activities, grazing and invasive plant and animal species
- Microclimate or smaller scale habitat elements provide habitat and refugia for narrow endemics and species with restricted distribution.

Guidelines (Special Habitats)

- At the project scale, conduct inventories of project sites and areas of disturbance if special habitats are identified. Provide potential mitigation measures to minimize effects to habitats for which ecological integrity has been identified as a concern.

Guidelines (At-Risk Species)

- Fire suppression techniques that minimize ground disturbance impacts should be used in sensitive habitat of at-risk species, with guidance provided by a resource advisor and considering the safety of people. Locations of key habitat areas should be provided in current fire decision support systems (e.g. the Wildland Fire Decision Support System) as appropriate.

Standard

- Conduct field surveys for TEP and SCC (at risk) plant species early enough in the NEPA planning process that projects can be designed to conserve and enhance TEP/SCC plants and their habitat. Conduct surveys as appropriate according to accepted professional standards (e.g. FSH 2609.26.11). If additional field surveys are to be conducted as part of project implementation, survey results must be documented in the project file.

Viability Analysis Determination:

Comment [B16]: The conditions that are "appropriate" for goldenbush should be defined here.

Comment [B17]: What is the risk to this species if such seed is not available/

Comment [B18]: For a restoration purpose, one should always do this. We believe this should be a standard.

Comment [B19]: If sagebrush invasion by trees is a stressor to the goldenbush, it should be listed under in the stressor section. Otherwise, this is not applicable to this species

Comment [B20]: Unclear if this is intended to be descriptive or a qualifier.

Comment [B21]: "Appropriately sized patches" should be defined and their importance to goldenbush viability described above.

Comment [B22]: This should be included in the habitat description section.

Comment [B23]: How are "special habitats" identified in the plan? Is there a map or some other narrative? We think it best to include a map.

Comment [B24]: What is a "resilient" condition for the habitat that goldebush occupies and how would we know when it is resilient?

Comment [B25]: What are the features of habitat and refugia for this species? These should be describe in the habitat section above and referenced more specifically in the guideline.

Comment [B26]: Identified by whom, when and based on what? If this was done in the plan, that should be specified here.

Comment [B27]: The locations should be provided in the forest plan.

Comment [B28]: This is stated as a required action. As such, it is a standard.

Comment [B29]: This is stated as a required action. As such, it is a standard.

Potential threats to the persistence of Gilman's goldenbush (*Ericameria gilmanii*) were identified to include invasive plant species, climate change, extremely limited distribution, and mining. Plan components aimed at preventing introduction and controlling existing invasive species will help ensure the ecological conditions needed for persistence of Gilman's goldenbush. In addition, plan components aimed at providing for diversity in species composition and the restoration of ecological integrity in sagebrush ecosystems and in special limestone habitats will provide for species persistence. The inclusion of the guideline to survey for Gilman's goldenbush at the project scale will help ensure that isolated activities do not result in loss of persistence of this species. Mining was not addressed in the Forest plan revision process, but it is anticipated that the plan components outlined above would provide for species persistence in the event that such projects would be proposed. It is my conclusion that the plan components for all action Alternatives would provide the ecological conditions necessary ~~for the persistence~~to maintain a viable population of this species in the Inyo National Forest plan area.

Comment [B30]: Which plan components are these? They should be included above.

Comment [B31]: The survey guideline is procedural and does not require conservation action.

Comment [B32]: Which components would ensure viability in the event a mine were proposed on top of the only population in the plan area? You have a guideline to "propose potential mitigation measures" but that certainly would not ensure viability.

Comment [B33]: This is the finding required by the planning rule (219.9).

Capability of the Plan. *Describe if and why it is beyond the authority of the Forest Service or not within the inherent capability of the plan area to maintain or restore the ecological conditions to maintain a viable population of a SCC in the plan area.* Not Applicable.

Best Available Science References:

Baldwin, BG, D Goldman, DJ Keil, R Patterson, TJ Rosatti, D Wilken, [eds]. 2012. The Jepson Manual, Vascular Plants of California, 2nd ed. University of CA Press, Berkeley, CA.

California Natural Diversity Database (CNDDB). California Department of Fish and Game, Biogeographic Data Branch. 2014. California Natural Diversity Database. Sacramento, CA. Data downloaded November 2014.

California Native Plant Society (CNPS), Rare Plant Program. 2015. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 27 May 2015].

Slaton, MR. 2015. The roles of disturbance, topography and climate in determining the leading and rear edges of population range limits. Journal of Biogeography 42: 255-266.

Prepared by: Michèle Slaton, Botanist, Forest Plan Revision Team