U.S. Forest Service
Pacific Southwest Region

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Species of Conservation Concern

Plan Components Analysis Example: great gray owl

Below is an example in narrative form of our assessment for determining threats to the species and whether the proposed plan components provide the ecological conditions necessary to support viable populations of an SCC. This example demonstrates the next step for SCCs, once we've identified the potential SCCs for each forest. Our SCC analysis as well as our work on the plan components associated with these SCC lists is ongoing.

An SCC is a plant or animal for which we have concerns about its ability to remain on a landscape for a long time. Each national forest will have its own SCC list, which is approved by the Regional Forester. Once we have an approved SCC list, we determine the needs of each species. We then design elements of a forest plan to guide management that sustains habitat or conditions to support or restore secure SCC populations to the extent we are capable of doing so. Forest plans help us maintain a forest that provides SCCs with the habitat and conditions they need to survive. For more information about SCCs and forest plan revision, visit our regional forest plan revision website.

Example:

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 (GGO) 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 U.S. Forest Service 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 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 National Forest, 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 the Park 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 in the plan area. Where appropriate, consider the spatial scales 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 on the margins of 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.

Winter (1986) found that a majority of great gray owls nest within 600 feet of meadows, or large meadow complexes (e.g. >26 acres), 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 cover 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 hectares in females and 20 hectares in males during the breeding season, and 2,457 hectares for females and 2,113 hectares 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 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 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).

- 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 was killed on a highway in or near the Sierra National Forest and another GGO was thought to be injured by a vehicle collision and was found in 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 GGO's in the Sierra Nevada.

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.

Some examples include:

Desired Conditions

- The composition, structure, and functions of old forests and surrounding landscapes are resilient to fire, drought, insects, pathogens, and climate change. Fire occurs as a key ecological process in forest types that are adapted to fire, creating, restoring and maintaining ecosystem resilience and fire-related composition and structure.

- The landscape contains a mosaic of vegetation types and structures that provide foraging and breeding habitat, movement and connectivity for a variety of old forest-associated species.

- Oak trees in varied ages are present, with wide spacing providing full sunlight around large old oak trees, enhancing their ability to produce abundant accord crops. Black oak is reproducing successfully. Sufficient numbers of mid-age black oaks have enough canopy space to form full crowns to replace old oaks that eventually die. Black oak snags greater than 20 inches in diameter, and live oak trees with dead limbs, hollow boles and cavities provide shelter, resting and nesting habitat for wildlife.

- Vegetation conditions, particularly structure and composition, are resilient to climate change and to the frequency, extent and severity of ecological processes. These include: fire in fire-adapted systems; drought; and flooding in riparian systems. Resilience means these ecosystems retain their components, processes and functions. Functioning ecosystem retain their components, processes and functions. Native insect and disease populations are generally at endemic levels with occasional outbreaks. Vegetation structural diversity mutually restricts the scale of insect and disease outbreaks to local levels.

- Meadows are in mid- to late-seral condition, with substantive ground cover and a rich and diverse species composition, especially of grasses and forbs. Meadows have high plant functional diversity and late successional functional types are presented. Perennial streams in meadows

contain a diversity of age classes of hardwood shrubs along the stream bank, where the potential exists.

- Native riparian vegetation is diverse, structurally complex and provides food and cover to sustain fish and wildlife populations.

- Species composition and structural diversity of plant and animal communities in riparian areas, wetlands and meadows promote ecological processes.

- Grazed areas have or are trending toward satisfactory soils condition, functional hydrology and biotic integrity.

Species-specific (Fine filter) Plan Components that Contribute to Persistence:

Examples include:

Standards

- Known SCC nest, roost, or den trees, including surrounding trees that provide beneficial thermal or predatory protection, should not be purposefully removed with the exception of hazard trees.

- Rangeland utilization standards will follow direction provided in appropriate appendix in the forest plan.

Guideline

- Design features, mitigation, and project timing considerations should be incorporated into ground-disturbing project's that may affect species of conservation concern occupied habitat near streams, seeps, and springs. Examples include, but are not limited to; undisturbed areas, timing restrictions, adjusted intensity of use, and avoiding use of large equipment.

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 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 national forests. Roads that the Forest Service does have authority for are not generally posted with speed limits due to the type of roads and lack of personnel to enforce such limits. However, owl/vehicle collisions could still occur on Forest Service 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 forest plan components including maximum utilization and stubble height standards substantially reduces grazing 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 for the persistence of this species in the Sierra and Sequoia National Forest plan areas.

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:

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.

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.

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