

Coniferous Forest



Coniferous Forest near Mt. Charleston, Spring Mountains, Clark County. Photo by John Boone.

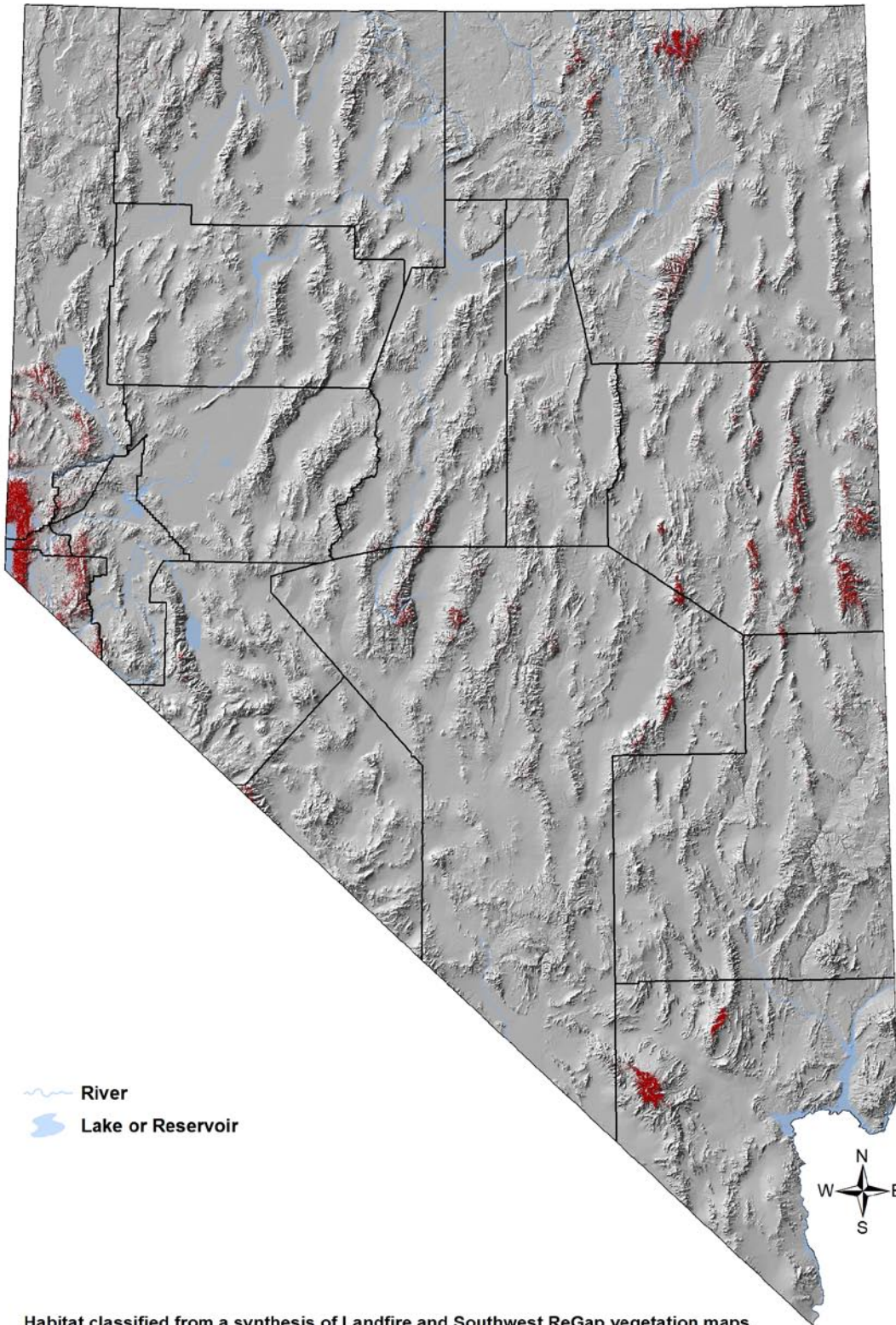
Key Bird-Habitat Attributes

Stand Structure	Multi-aged stands with mosaic of open canopy patches with shrub understory, small aspen patches, and dense-canopy groves; patch size within forest mosaic vary from 2-5 ha scale or larger, except for openings which may be relatively small
Ideal Scale for Conservation Action	500 ha [1,200 ac] or more
Plant Species Composition	Stands with 3 or more coniferous species (e.g., white pine, white fir, Jeffrey pine, lodgepole pine, and limber pine) better than monotypic stands; large-seeded conifers particularly valuable to birds; forbs, deciduous shrubs, and multiple species of xeric shrubs in the understory or in openings
Plant Condition	Healthy trees with seed crops beneficial; snags (> 30 cm [12 in] dbh) of conifers and deciduous trees important
Distance to Riparian/Spring Habitats	Proximity of water-dependent habitat increases value to birds
Presence of Cliffs > 30 m [100 ft] Tall	Presence of tall cliffs increases value to birds

Conservation Profile

Estimated Cover in Nevada	222,500 ha (550,000 acres) 0.8% of state
Landownership Breakdown	USFS = 58% BLM = 20% Private = 13% Other = 9%
Priority Bird Species	Sooty Grouse Dusky Grouse Mountain Quail Northern Goshawk Band-tailed Pigeon Flammulated Owl Spotted Owl Calliope Hummingbird Williamson's Sapsucker White-headed Woodpecker Olive-sided Flycatcher Hermit Warbler Grace's Warbler (Bald Eagle) (Lewis's Woodpecker)
Indicator Species	None needed
Most Important Conservation Concerns	Increased fire frequency or intensity Insect outbreaks Plant pathogens Climate change (change in precipitation and temperature) Urban, suburban, and industrial development Non-motorized recreation
Recovery Time	50-100 years
Regions of Greatest Conservation Interest	Carson, Jarbidge, Ruby, Snake, Schell Creek ranges, Spring Mountains, Sheep Range
Important Bird Areas	Carson Range Goshute Mountains Great Basin National Park Jarbidge Mountains Mount Grant Northern Snake Range Ruby Mountains Spring Mountains Toiyabe Range Wellington-Pine Grove Hills

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Habitat classified from a synthesis of Landfire and Southwest ReGap vegetation maps. Small patches of habitat may not be visible on this map, and some areas may be misclassified.

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Overview

Coniferous forests (excluding pinyon-juniper) are relatively scattered on the Nevada landscape, accounting for less than one percent of its total land area. Coniferous forests tend to occur in fairly small patches throughout the state above the pinyon-juniper zone, although in the Carson Range of western Nevada and in some other ranges, they do occur in larger stands. Forest types vary greatly with elevation and local climate. Some Priority bird species are restricted to the more productive mixed-conifer forests of the Sierra Nevada, while others occur in the more isolated mountain ranges of the central Great Basin. Yet another group of species makes use of the ponderosa pine stands of southern and eastern Nevada.

The many Priority species that rely on Coniferous Forest habitat have a diverse set of requirements, and therefore maintenance of heterogeneity across the forested landscape will be of key importance in conserving them all. That said, the Flammulated Owl's (p. Spp-45-1) habitat requirements capture most of this diversity, and it therefore serves fairly well as a single species "model" for coniferous forest management. Its preferences include mixed species / mixed age stands, a deciduous tree presence, snags, and forest openings with a well developed understory. Major forest components (such as different age classes of trees, or stands with different amounts of canopy closure) should occur in patches of 2 ha [5 ac] or larger (and at least occasionally in much larger patches), although forest openings will often be much smaller. This formula, applied over large landscapes, will generally meet the needs of more specialized species, including those requiring larger stands of closed-canopy forest (Spotted Owl and Hermit Warbler), those requiring forest openings (Olive-sided Flycatcher), those requiring large snags and/or deciduous trees (the woodpeckers), and those requiring open park-like stands of old pines with an understory (Grace's Warbler). Figure Hab-5-1 summarizes an idealized forest mosaic.

It should be noted that fire management, including use of prescribed fire where appropriate, is a critical element in managing forests to sustain this landscape diversity. Specific fire management tactics, however, will vary with forest type, size, and geographical location.

Main Concerns and Challenges

The following top seven conservation concerns were identified for coniferous forests in our planning sessions:

- Increased fire frequency or intensity
- Insect outbreaks
- Plant pathogens
- Change in precipitation and snowmelt related to climate change
- Change in temperature related to climate change
- Urban, suburban, and industrial development
- Non-motorized recreation

In contrast to most western states, Nevada has very little of the timbering activity that often dominates forest conservation issues in other regions. However, we share with other western

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states an increase in the frequency of large intense fires, especially in the Sierra Nevada (Miller et al. 2009). This may be in part due to fuel buildup from fire suppression, which also allows shade-tolerant species such as white fir to increase the stand density of otherwise more open pine stands (Raumann and Cablk 2008). Climate change is expected to further increase the likelihood of extensive crown fires due to lower precipitation and earlier snowmelt (Westerling et al. 2006). Although some bird species benefit from local fires (e.g., Olive-sided Flycatcher), others do not, and a primary management challenge is to maintain an appropriate balance of fire on the landscape in light of an increased frequency of catastrophic fires.

Fuels reduction is one tool used to slow fire spread and reduce fire intensity, especially near human settlements (Reinhardt et al. 2008). Although it is questionable whether it can be a universal remedy for managing fires (Schoennagel et al. 2004), some successes are reported from the Lake Tahoe basin (Safford et al. 2009). More study is needed on the effects fuel reduction on wildlife (Elliot et al. 2010). In general, however, we expect that fuels reduction benefits birds that prefer more open forests, but its effects on species that need dense forest stands and dead wood are poorly documented. To integrate fuels reduction treatments with wildlife conservation goals (Lehmkuhl et al. 2007), we therefore recommend assessing which Priority species are present in a stand, or are expected to be present, and attempting to accommodate their habitat requirements (see respective species accounts) within the fuels reduction plan where possible.

Local insect outbreaks or pathogen infections are natural occurrences in coniferous forests and even beneficial to many bird species, especially woodpeckers (Drever and Martin 2010). However, recent outbreaks have become more extensive and uncontrollable than they appear to have been historically. This may be in part due to the increasing density of stands in some areas (Smith et al. 2005), or due to the homogenization of forests from past logging (Drever et al. 2006). Climate change effects are expected to increase the severity and longevity of insect outbreaks even more (Waring et al. 2009). Given that climate change is also expected to increase the likelihood of crown fires, maintaining diverse healthy forests that meet the habitat requirements of a diverse suite of bird species will probably become more challenging. The combined effects of all these factors on bird populations should be studied on an ongoing basis for adaptive management.

In some parts of the state, urban or suburban encroachment into Coniferous Forest habitat is a concern, especially in the Spring Mountains near Las Vegas and in the Lake Tahoe basin (Raumann and Cablk 2008, Heckman et al. 2008). Habitat loss or degradation as a result of development of infrastructure, as well as direct human disturbance, is expected to impact bird populations (Schlesinger et al. 2008) in these areas. Indirect effects of urban development, such as intensive fuels reduction, introduced predators, fire suppression, and artificial ignition sources are also concerns.

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Not to Scale

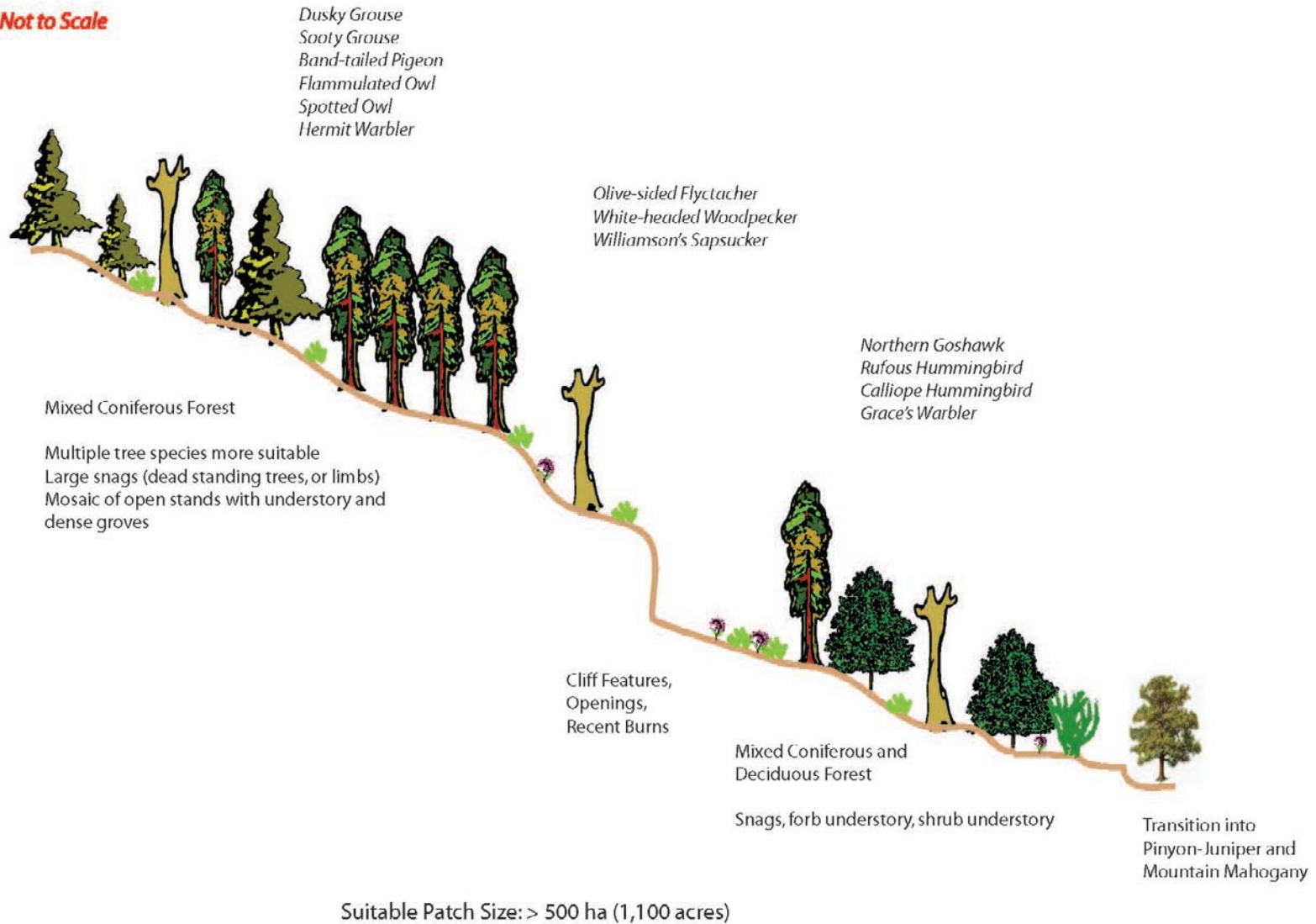


Figure Hab-5-1: Idealized coniferous forest landscape to maximize the number of coniferous forest associated Priority bird species.

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Conservation Strategies

Habitat Strategies

- Manage at **landscape scale (> 500 ha [1,200 ac])** with the goal of maintaining a diverse mosaic of mixed-age, -size, and -density tree stands, large snags, deciduous tree components (especially aspen and willow), and forest openings
- Priority for conservation action should be given to sites where mosaics of **mixed-age conifer forest, deciduous woodland, and shrubland** either already exist or can be achieved
- **Protect even small patches of aspen or willow** that are interspersed within the conifer forest matrix (Griffis-Kyle and Beier 2003)
- Protect mature coniferous forest in the Carson Range, with focus on closed-canopy stands of > 50 ha [125 ac]
- **Design fuels reduction projects** to retain older and mixed-age stands, large-diameter trees and snags, and to create moderate canopy closure at the recommended patch sizes, where possible
- Fuels reduction that **thins smaller trees** to reduce fuel ladders can help to protect important older stands from catastrophic fire
- **Fire management** should generally encourage small-scale, patchy fires that increase diversity of the forest mosaic and create forest openings. Active reforestation with native species, particularly those that help increase tree species diversity, may be desirable
- Proximity to **water** (riparian areas, springs, wet meadows), **cliffs** (> 30 m [100 ft] tall), or **abandoned mines** (which may be gated) raise the importance of a site for bird conservation
- The majority of Priority bird species nest between **May 1 and July 15**, and some of them are particularly sensitive to nest disturbance. This is the time period when intensive treatments or potentially disruptive activities should be avoided when possible

Research, Planning, and Monitoring Strategies

- Conduct additional research to better **determine habitat and patch size requirements, and the importance of riparian habitat within the forested landscape** for species such as Grace's Warbler, Williamson's Sapsucker, and White-headed Woodpecker
- Investigate the **role of fire intensity, scale, and frequency** in providing suitable habitat for various species; review fire management strategies accordingly
- **Continue and expand forest bird monitoring** as part of the Nevada Bird Count program to better assess population trends of a complex suite of species

Public Outreach Strategies

- **Promote public appreciation** of the wildlife values provided by a healthy coniferous forest, including education about the role of fire
- Encourage "**responsible recreation**," including use of maintained trails to protect understory, avoiding disturbance to sensitive nest and roost sites, etc.