Montane Shrubland

Montane Shrubland habitat in the Santa Rosa Range, Humboldt County. Photo by Elisabeth Ammon.

Key Bird-Habitat Attributes

Vegetation Composition	Diverse species of deciduous shrubs, sage, and herbaceous components (mostly perennial bunchgrasses and forbs); mountain big sagebrush, manzanita, snowberry, currants, serviceberry, chokecherry, buckbrush, bitterbrush, cliffrose, hawthorn, and similar flower and berry-producing shrubs increase habitat value significantly; flowering forbs critical to several Priority species
Ideal Scale for Conservation Action	200 ha [500 ac] or larger to accommodate different patch types and avoid fragmentation
Vegetation Structure	Mostly low-growing shrubs, 20-40% cover, with herbaceous layer up to 60-80% and at least 8-12 inches [20-30 cm] high (for sharp-tailed grouse); horizontal diversity (mosaic of different patches) increases value
Plant Species	Multiple shrub and forb species increase habitat value for birds
Distance to Water	Mesic habitats (riparian, wetland, open water, springs) within 1,000 m [3,300 ft] increase habitat value
Other Features	Abandoned mineshafts and cliffs >30 m [100 ft] tall add habitat value for some species

Conservation Profile

Estimated Cover in Nevada	1,055,000 ha [2,608,000 ac] 3.7% of state
Landownership Breakdown	BLM = 48% USFS = 30% Private = 18% Other = 4%
Priority Bird Species	Greater Sage-Grouse Sooty Grouse Dusky Grouse Sharp-tailed Grouse Mountain Quail Common Poorwill Calliope Hummingbird Gray Flycatcher Sage Thrasher Virginia's Warbler Green-tailed Towhee Brewer's Sparrow Black-chinned Sparrow (Black Rosy-Finch)
Indicator Species	None needed
Most Important Conservation Concerns	Changes in fire frequency or intensity Climate change (change in precipitation and temperature) Livestock, wild horse and burro grazing Motorized recreation Invasive weeds Conifer encroachment
Habitat Recovery Time	25-50 years
Regions of Greatest Conservation Interest	Northern, northeastern, eastern, and central Nevada
Important Bird Areas	Bilk Creek – Montana Mountains Carson Range Goshute Mountains Great Basin National Park High Rock Resource Area Jarbidge Mountains Monitor Valley Mount Grant Northern Snake Range Ruby Mountains Sheldon NWR Spring Mountains Toiyabe Range Wellington-Pine Grove Hills

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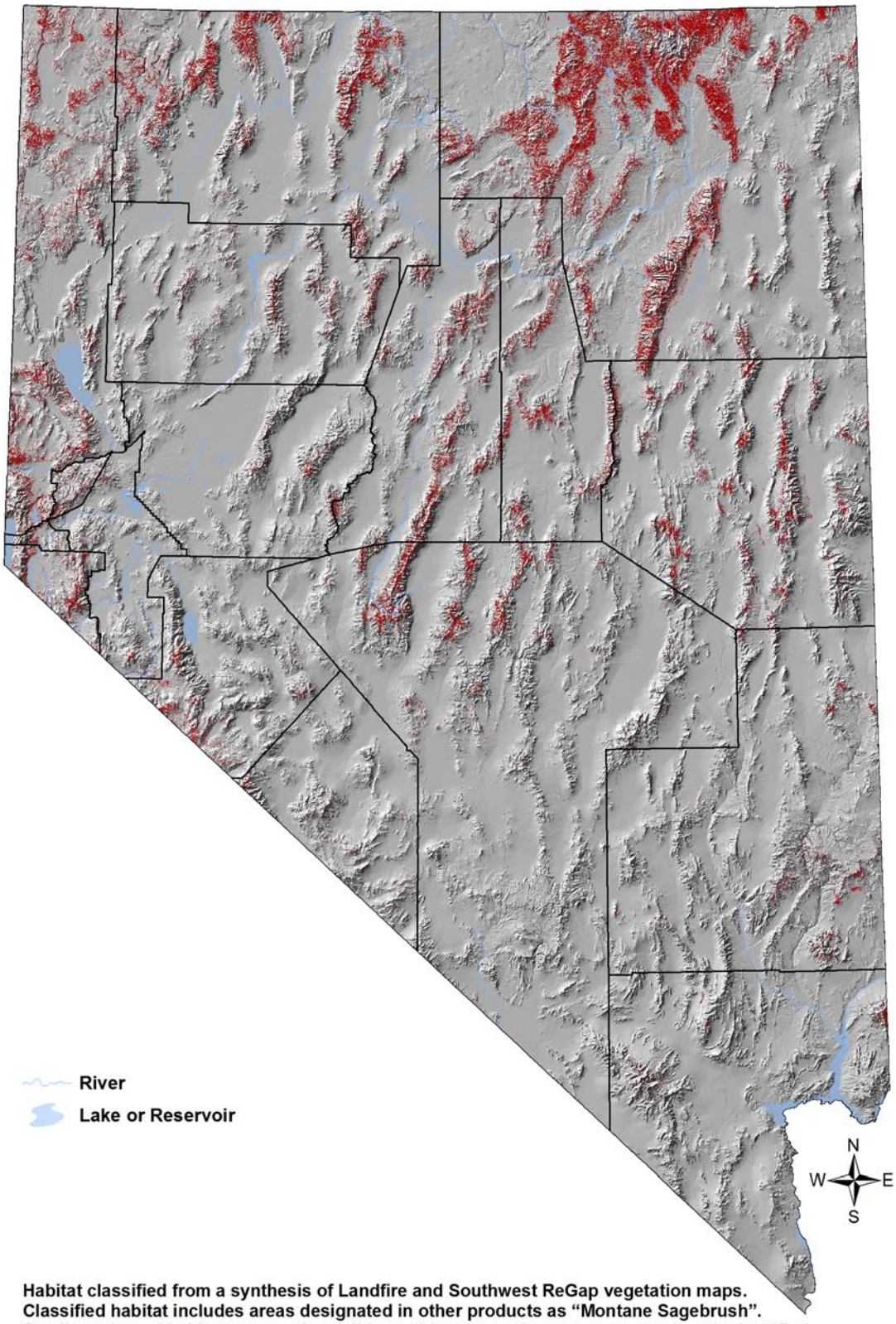

Habitat classified from a synthesis of Landfire and Southwest ReGap vegetation maps.
Classified habitat includes areas designated in other products as "Montane Sagebrush".
Small patches of habitat may not be visible on this map, and some areas may be misclassified.

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Overview

Montane Shrubland habitat includes several shrub communities within and above the pinyon-juniper zone, with the most common one being montane sagebrush. Other shrublands of montane areas include mixes of species such as snowberry, serviceberry, bitterbrush, and sumac. Sage steppe and montane riparian plant communities are interspersed in these landscapes, and the diversity of shrubland types makes accurate land cover mapping difficult. In the Sierra Nevada ecoregion, successional shrublands in forest openings are often dominated by buckbrush (*Ceanothus velutinus*), green-leaf manzanita (*Arctostaphylos patula*), and currants, which can form a particularly dense shrub cover with little understory. Montane shrublands are among the more species-rich bird habitats of Nevada. For instance, in an elevational assessment of bird communities in Great Basin National Park, both bird abundance and bird species richness were reported to be highest in plots with a substantial component of mountain big sagebrush (Medin et al. 2000).

Montane sagebrush is similar to lowland sagebrush in many ways, but it often has higher shrub cover and higher forb productivity (Davies and Bates 2010). Historical fire return intervals are thought to have been relatively frequent (10–25 years) in more mesic communities (Knick et al. 2005), but in drier sites, sagebrush could probably not have been maintained with such frequent disturbance (Welch and Criddle 2003). Unlike in lowland sagebrush, fire intervals may have lengthened in some montane shrublands in recent times due to removal of fine fuels by grazing, and to a lesser extent, fire suppression (Miller and Rose 1999).

Both a healthy shrub canopy and an intact herbaceous understory are important elements for montane shrubland birds (Figure Hab-14-1). A diversity of shrub species is important to some bird species, such as Green-tailed Towhee and Sharp-tailed Grouse, but more homogeneous stands of montane sagebrush are heavily used by Brewer's Sparrows. A healthy forb layer is especially important in montane sagebrush to species such as Greater Sage-Grouse that rely on forbs in late summer, when forb understories in the lowlands begin to dry up.

Main Concerns and Challenges

The following top seven conservation concerns were identified in our planning sessions for Montane Shrubland in Nevada:

- Changes in fire frequency or intensity
- Change in precipitation and snowmelt related to climate change
- Change in temperature related to climate change
- Livestock, wild horse and burro grazing
- Motorized recreation
- Invasive weeds
- Conifer encroachment

These concerns are somewhat difficult to rank, since none of them are thought to be exceptionally severe at the present time.

Mountain big sagebrush communities generally are more resilient to disturbance and recover more rapidly than either basin or Wyoming big sagebrush because of greater precipitation and possibly longer seed viability (Provencher et al. 2007). Some montane shrub species may be favored over montane sagebrush by fire in the long term, because they can resprout from the roots when fire removes competing shrubs.

In some areas, altered fire regimes along with other factors have resulted in conifer expansion into Montane Shrubland habitat. Hypotheses for the expansion of pinyon-juniper woodlands over the last century include altered fire regimes, grazing, natural dynamic processes, recovery from past impacts, and a changing climate (Romme et al. 2009). In the Sierra Nevada, montane shrublands are predisposed to recurring fires that have been observed to perpetuate shrub cover on sites otherwise suited for trees, so the artificial exclusion of fire has caused the total montane shrubland area to shrink by over 60%, and the heterogeneity of montane landscapes has been correspondingly reduced (Nagel and Taylor 2005). Fire can promote growth of desirable shrubs and control conifer encroachment, but it can also lead to sagebrush declines and promote invasive weeds or undesirable shrubs (Giesen and Connelly 1993). Fire can enhance native perennial forbs and grasses (e.g., Holmes 2007), particularly where sagebrush is abundant and exotic species are limited. In some mountain big sagebrush communities, where shrub canopy cover exceeds 35%, perennial forbs can increase 2-3 fold following fire (Crawford et al. 2004). However, the response of perennial forbs and grasses following fire is highly variable (Nelle et al. 2000). A patchwork of small disturbances is probably required to maintain a balance between shrubs and forbs.

Great Basin shrubland plant species are not well adapted to intense, continuous grazing pressure (Mack and Thompson 1982), but livestock or feral horse grazing can be accommodated without unacceptable conservation consequences as long as herbaceous understories are preserved. That said, grazing pressure sometimes exceeds this threshold. For example, chronic grazing pressure from horses has been correlated with reduced plant species richness in some areas (Beever et al. 2008), and grouse species that consume forbs during parts of their seasonal cycle often select areas that are the least modified by grazing (Saab and Marks 1992). Other studies of grazing effects on shrubland birds have shown mixed results (Page et al. 1978, Saab et al. 1995).

Exotic annual grasses, such as cheatgrass, usually do not greatly affect relatively mesic and cool montane shrublands dominated by mountain big sagebrush (Crawford et al. 2004). However, this threat could increase with climate change (Bradley 2009). Likely effects of climate change on montane shrublands have not been systematically evaluated. However, they exhibit sharply reduced productivity in drought years (Bradley and Mustard 2008), and reduced precipitation likely reduces the productivity and diversity of the forb community that is so critical to several Priority bird species. Changing temperatures and altered fire regimes could also affect the rate of conifer encroachment (Fleishman and Dobkin 2009). Invasive species will become more of a threat as higher elevation sites become warmer. The incidence of sustained grazing and its associated impacts are also expected to increase with a warmer and drier climate (Provencher et al. 2007).

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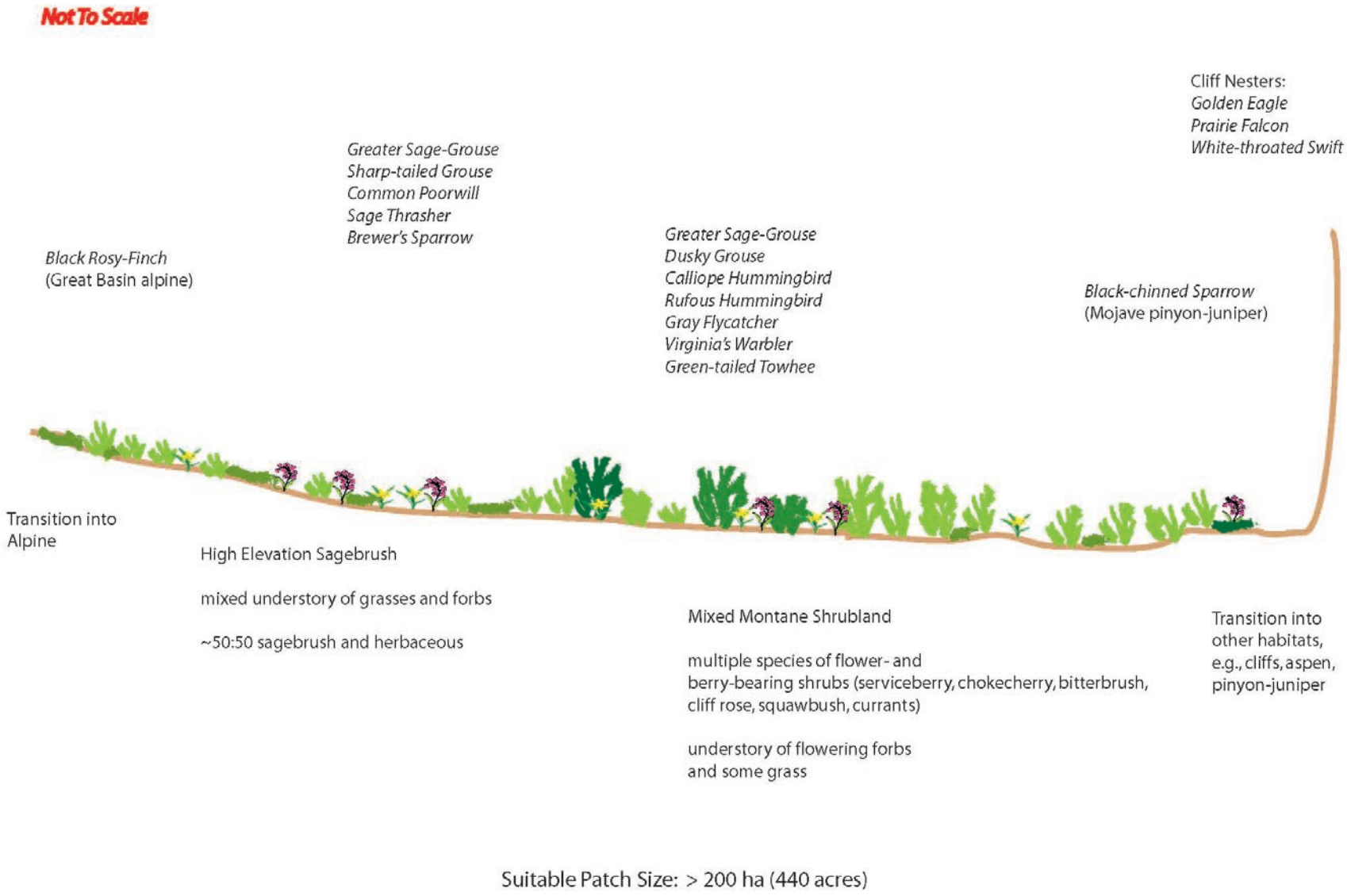

Figure Hab-14-1: Idealized montane shrubland landscape to maximize the number of montane shrubland associated Priority bird species.

Conservation Strategies

Habitat Strategies

- **Manage at a landscape scale of 200 ha [500 ac]** or larger, if possible. Where grouse occur, conservation strategies from grouse initiatives and species accounts should be implemented at the recommended spatial scales. Montane shrubland landscapes without a significant sagebrush component ideally would vary in shrub size classes, densities, and amount of understory with a patch size of approximately 2-10 ha [5 – 25 ac] depending on soil conditions and fire history. High shrub species diversity, high patch type diversity, and a healthy forb component all benefit Priority bird species.
- Where possible, concentrate grazing activity within the plants' dormant season and **protect current season's growth** through the bird nesting season (**May 15 – July 15**), to preserve at least 50% of annual growth (Paige and Ritter 1999).
- **Highest priority for protection are more mesic areas** that have high cover of succulent forbs and provide high-quality late-summer brood rearing areas for Priority upland game species (Atamain et al. 2010).
- Adjacent habitat types, such as tall cliffs, aspen, pinyon-juniper, montane riparian, and snow pockets increase the potential value of a particular site to Priority species. We recommend that disruptive land uses are avoided to the extent possible within **1,000 m [3,300 ft] or more** of these complex habitat interface zones.
- **Abandoned mine entrances** can provide important winter habitat for Black Rosy-Finches. Before closing mines, winter surveys should be conducted to determine rosy-finch use, and if they are present, gating is preferable.

Research, Planning, and Monitoring Strategies

- Study the relationships between montane shrub birds and the landscape patterns and habitat changes that result from **altered fire regimes** (Donovan et al. 2002).
- Investigate **effects of OHV use** on Priority landbirds and habitat integrity.
- Continue **long-term monitoring of landbirds** statewide through the Nevada Bird Count.

Public Outreach Strategies

- Bird conservation initiatives may increase outreach to land managers by holding **workshops on montane birds** and their habitat needs, providing "best management practices" tools, and helping to review siting plans for development.