

# Brewer's Sparrow

*Spizella breweri*



Photo by Jacque Lowery

## Habitat Use Profile

| Habitats Used in Nevada   |   |
|---|---|
| Montane Shrubland (primarily montane sagebrush)<br>Sagebrush<br>Salt Desert Scrub |   |
| Key Habitat Parameters •  |   |
| Plant Composition   | Sagebrush, greasewood, perennial upland grasses                                       |
| Plant Density & Size  | High shrub density preferred, shrub canopy height usually < 1.5 m [5 ft] <sup>9</sup> |
| Mosaic  | Bare ground avoided <sup>9</sup>  |
| Distance to Water   | More likely to be present < 1 km [0.6 mi] from water <sup>3</sup>                     |
| Response to Vegetation Removal  | Negative to all reduction in plant cover <sup>9</sup>                                 |
| Area Requirements •   |   |
| Minimum Patch Size  | Unknown; estimated at 20 ha [50 ac] <sup>E0</sup>                                     |
| Recommended Patch Size  | > 150 ha [370 ac] <sup>E0</sup>   |
| Territory Size  | 0.5-2.4 ha [1.2 – 5.9 ac] <sup>9</sup>  |

## Conservation Profile

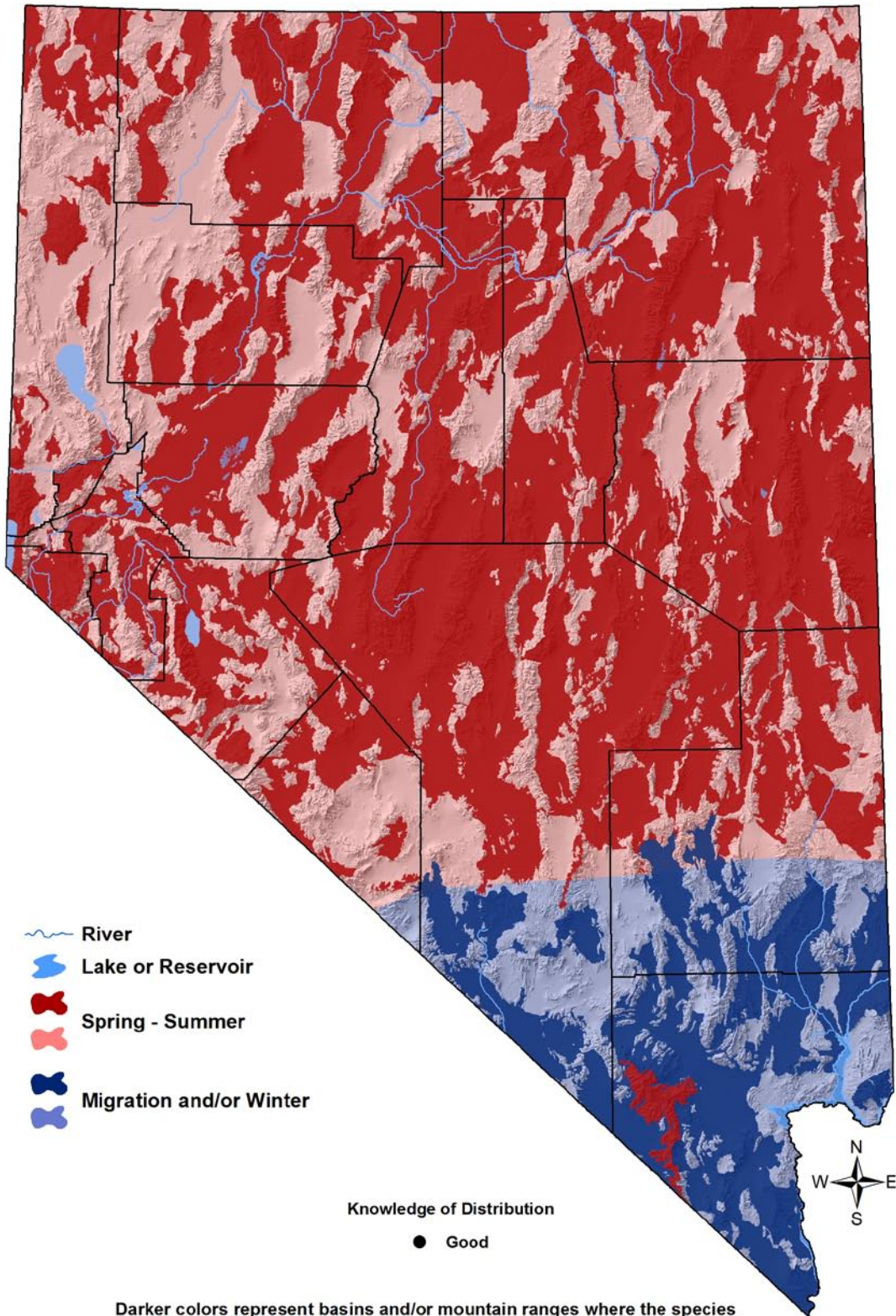
| Priority Status  |   |
|--|---|
| Conservation Priority Species  |   |
| Species Concerns   |   |
| Historical and recent declines<br>Habitat threats<br>High stewardship responsibility |   |
| Other Rankings   |   |
| Continental PIF  | Watch List  |
| Audubon Watchlist  | Yellow  |
| NV Natural Heritage  | S4B   |
| USFWS  | Bird of Conservation Concern, Migratory Bird                |
| BLM  | None  |
| USFS   | None  |
| NDOW   | Conservation Priority                                       |
| Trends   |   |
| Historical •   | Rangewide declines since 1968 <sup>9, 10</sup>              |
| Recent •   | Declines of 2% / year across West <sup>10</sup>             |
| Population Size Estimates  |   |
| Nevada (NBC) •   | 7,400,000   |
| Global •   | 16,000,000 <sup>8</sup>                                     |
| Percent of Global  | > 40%   |
| Population Objective   |   |
| Increase by 20% <sup>E0</sup>  |   |
| Monitoring Coverage  |   |
| Source   | Nevada Bird Count   |
| Coverage in NV   | Good  |
| Key Conservation Areas   |   |
| Protection   | Montane shrubland and high-quality sagebrush in Great Basin |
| Restoration  | Degraded sagebrush, particularly if close to water          |

## Natural History Profile

| Seasonal Presence in Nevada                    |  |
|--|--|
| Spring-Summer (Great Basin)<br>Winter (Mojave) |  |
| Known Breeding Dates in Nevada                 |  |
| Mid April – early August <sup>2</sup>          |  |
| Nest and Nesting Habits                        |  |
| Nest Placement                                 | In dense crown of tall shrub, about 0.7 m [2.3 ft] off-ground <sup>9</sup> |
| Site Fidelity                                  | Moderate for breeding territory <sup>9</sup>                               |
| Food Habits                                    |  |
| Basic  | Shrub gleaner and forager  |
| Primary Diet                                   | Insects within shrub layer <sup>9</sup>                                    |
| Secondary Diet                                 | Small seeds <sup>9</sup>   |

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Darker colors represent basins and/or mountain ranges where the species has been recorded within the past 12 years. Lighter colors represent the broader area within which the species is presumed to occur in appropriate habitat types.

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## Overview

One of Nevada's most widely distributed and abundant birds,<sup>1</sup> the Brewer's Sparrow is nonetheless a conservation concern due to ongoing regional and rangewide declines,<sup>10</sup> along with the fact that Nevada hosts approximately 40% of the global breeding population. The Nevada Bird Count and Nevada Breeding Bird Atlas project extended the Brewer's Sparrow's confirmed breeding range to southern Nevada, although it is far more abundant in the Great Basin portion of the state. Brewer's Sparrows are attracted to sagebrush in many different settings, not only within the relatively monotypic "sagebrush sea" of the valley floors.<sup>5</sup> For instance, NBC data indicate that Brewer's Sparrows have especially high breeding densities in montane sagebrush (which occurs within the NBC-defined Montane Shrubland habitat type),<sup>3</sup> and they even occur in sagebrush-dotted meadows that are embedded within conifer forest zones, provided that the meadows are not highly isolated.<sup>12</sup> Proximity to forest edge, however, appears to increase the potential for nest predation, and Brewer's Sparrow densities and nest success rates are consequently highest in treeless areas.<sup>6</sup>

Although the Brewer's Sparrow uses a wider variety of landscapes and is probably less sensitive to fragmentation than the Sage Sparrow,<sup>5</sup> the species is still most abundant in relatively large habitat patches, and it is negatively affected by the widespread loss and degradation of high-quality sagebrush habitat.<sup>7</sup> Several studies provide insight about the Brewer's Sparrow's landscape and patch-size affinities. For instance, one study in eastern Washington showed that reproductive success was lower in landscapes fragmented by agriculture than in continuous shrubsteppe landscapes.<sup>11</sup> Others demonstrated in a somewhat contradictory fashion that while Brewer's Sparrows generally decline after large-scale burns,<sup>4</sup> they may not be seriously affected by patchier burn patterns affecting < 50% of the landscape, as long as the unaffected areas provide the habitat structure required by nesting birds.<sup>6</sup> Nevada Bird Count analyses and other sources<sup>7</sup> indicate that Brewer's Sparrows are most abundant when the landscape mosaic provides varying shrub densities, and furthermore, that they are most likely to occur within 1,000 m [3,300 ft] of surface water.<sup>3</sup>

Threats to Brewer's Sparrow are primarily those that result in the loss or degradation of mature sagebrush cover,<sup>7</sup> which the species uses almost exclusively during the breeding season. Although PIF's "North American Landbird Conservation Plan"<sup>8</sup> suggested a population objective of "Increase by 100%" for the Brewer's Sparrow, we believe that in Nevada, a more realistic goal is a population increase of 20% , which could be achieved through restoration or regeneration of habitat lost to fire over the last decade, coupled with improved livestock management.

## Abundance and Occupancy by Habitat

Brewer's Sparrows occurred on fourteen different NBC-defined habitat types, generally as a function of the sagebrush patches that were embedded within or located in

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juxtaposition to the dominant vegetation. Densities in the table below are shown only for habitats with a large sagebrush component.

### Birds / 40 ha on NBC Transects in the Great Basin and Mojave Regions

| Primary Habitat at Transect | Transects Occupied | Birds/40 ha (95% C.I.) |
|-----------------------------|--------------------|------------------------|
| <b>Great Basin</b>          |                    |                        |
| Sagebrush                   | 94% (31/33)        | 16.0 (11.1 – 20.9)     |
| Montane Shrubland           | 85% (17/20)        | 24.6 (15.2 – 34.0)     |
| Pinyon-Juniper              | 54% (38/70)        | 7.9 (5.3 – 10.5)       |
| Salt Desert                 | 74% (17/23)        | 10.7 (6.7 – 14.7)      |
| <b>Mojave</b>               |                    |                        |
| Sagebrush                   | 85% (22/26)        | 21.2 (14.3 – 28.1)     |
| Montane Shrubland           | 75% (6/8)          | 10.0 (0.0 – 21.4)      |

### Nevada-Specific Studies and Analyses

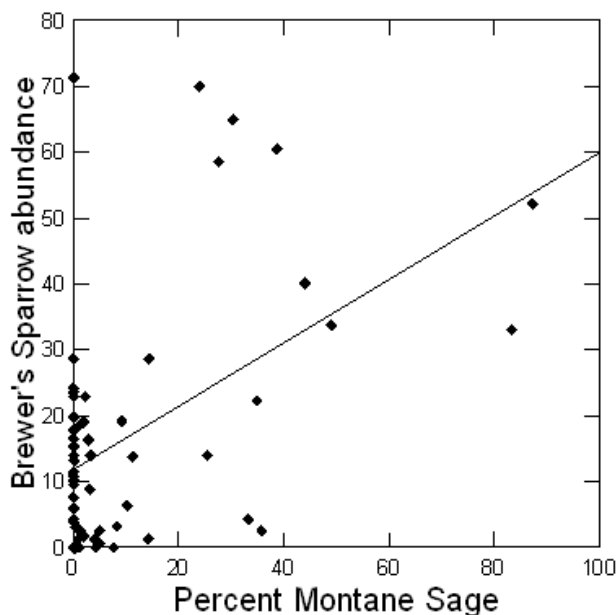
#### Habitat Requirements (NBC data)

According to logistic regression analysis (*Appendix 3*). Brewer's Sparrows were more likely to be detected on sites with fewer trees ( $p < 0.001$ ), greater sagebrush heights ( $p < 0.001$ ), and the presence of surface water within 1 km [0.6 mi] ( $p < 0.001$ ) as compared to non-detection sites. Litter cover, however was a poorer predictor ( $p = 0.09$ ). The odds of finding Brewer's Sparrows within 1 km of surface water were very high. It is unclear whether the association of Brewer's Sparrow with proximity of water was due to the physical availability of water itself, or an indirect result of better shrub cover in areas that are closer to water.

#### Landscape Associations (NBC data)

Although ubiquitous in valley-floor Sagebrush habitat ( $p < 0.001$ ), the Brewer's Sparrow had an even stronger positive relationship with montane sagebrush (when separated out from the Montane Shrubland habitat type; see graph below). Thus the Brewer's Sparrow exhibits a much wider use of the full elevational range of sagebrush vegetation than either the Sage Thrasher or Sage Sparrow. Associations were still positive, but not as strong, for landscapes with significant pinyon-juniper ( $p = 0.07$ ) or lowland riparian ( $p = 0.04$ ) components after controlling for sagebrush. The Brewer's Sparrow's association with Salt Desert was less pronounced than was the case for Sage Sparrow and Sage Thrasher. At the landscape scale (10 km [6.2 mi]), Brewer's Sparrows were not as strongly associated with proximity to water as they were in the microhabitat analysis described above (*Appendix 3*).

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### Main Threats and Challenges

#### Habitat Threats

Loss, degradation, or possibly fragmentation of high-quality sagebrush and montane sagebrush shrubland due to:

- Fire
- Invasive plants, especially cheatgrass
- Expansion of pinyon-juniper woodland into sagebrush
- Heavy livestock grazing
- Heavy OHV use

It is likely that some of these threats are more pronounced and require more management attention in lowland sagebrush habitat than in montane sagebrush.

#### Research, Planning, and Monitoring Challenges

- Uncertainty about the Brewer's Sparrows sensitivity to habitat fragmentation, and of minimum acceptable patch sizes
- Further research is needed to determine the best management strategies for the pinyon-juniper / sagebrush interface zone for multi-species benefits
- Although short-term fire management strategies are established, further research and planning is needed to clarify the most beneficial longer-term fire management strategies that protect important habitat while promoting its long-term viability

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## Conservation Strategies

### Habitat Strategies

- Montane Shrubland (p. Hab-14-1), Sagebrush (p. Hab-17-1), and Salt Desert Scrub (p. Hab-18-1) habitat conservation strategies benefit this species
- Protect large expanses of high-quality sagebrush (see below) from fire to the extent possible
- Within large expanses of high-quality sagebrush with few invasive plants, attempt to channel activities that can promote establishment or maintenance of cheatgrass, including heavy livestock grazing and heavy OHV use, to areas that are already degraded
- Where pinyon-juniper encroachment is known to have recently occurred within high-quality sagebrush habitat, conduct pinyon-juniper removal projects. However, we recommend that pinyon-juniper management projects consider the importance of maintaining a natural, interspersed interface zone between sagebrush shrublands and pinyon-juniper woodlands, as discussed in the Pinyon-Juniper (p. Hab-16-1) habitat account

### Research, Planning, and Monitoring Strategies

- Identify and map large patches of intact, mature sagebrush that contain dense shrubs and little cheatgrass
- Develop a fire management strategy that ensures that high-quality sagebrush habitat receives priority fire suppression efforts in the immediate future. Additionally, develop fire management strategies that balance the need for short-term habitat protection with long-term habitat viability
- Conduct additional research to determine how to pinyon-juniper management projects can both benefit Brewer's Sparrows as well as the suite of birds that use the pinyon-juniper / sagebrush interface zone (see p. Hab-16-1)
- Continue monitoring to better determine phenology and extent of breeding in southern Nevada

### Public Outreach Strategies

- None identified

References: <sup>1</sup>Floyd et al. (2007); <sup>2</sup>GBBO unpublished Atlas data; <sup>3</sup>GBBO unpublished NBC data; <sup>4</sup>Holmes (2007); <sup>5</sup>Knick and Rotenberry (1995); <sup>6</sup>Knick et al. (2005); <sup>7</sup>Paige and Ritter (1999); <sup>8</sup>Rich et al. (2004); <sup>9</sup>Rotenberry et al. (1999); <sup>10</sup>Sauer et al. (2008); <sup>11</sup>Vander Haegan (2007); <sup>12</sup>Wilson et al. (2009); <sup>EO</sup> Expert opinion