



Brewer's Sparrow, photo by ©Bill Radke

Conservation Profile

Species Concerns

Declining Populations
Habitat Loss and Degradation
Increasing Fire Frequency
Invasive Weeds
Unsustainable Livestock Grazing

Conservation Status Lists

USFWS ¹	BCC List (BCR16)
AZGFD ²	Tier 1C
DoD ³	Yes
BLM ⁴	No
PIF Watch List ^{5b}	No
PIF Regional Concern ^{5a}	BCR 16

Migratory Bird Treaty Act

Covered

PIF Breeding Population Size Estimates⁶

Arizona	31,000 ●
Global	17,000,000 ●
Percent in Arizona	0.18%

PIF Population Goal^{5b}

Maintain

Trends in Arizona

Historical (pre-BBS)	Unknown
BBS ⁷ (1968 – 2013)	-2%/year (CO Plateau) ○

PIF Urgency/Half-life (years)^{5b}

> 50

Monitoring Coverage in Arizona

BBS ⁷	Not adequate
AZ CBM	Not covered

Associated Breeding Birds

Sage Thrasher, Sagebrush Sparrow, Lark Sparrow

Breeding Habitat Use Profile

Habitats Used in Arizona

Primary: Cold Temperate Desertscrub
Secondary: Semi-desert Grassland

Key Habitat Parameters

Plant Composition	Primarily big sagebrush; also saltbush, greasewood, bitterbrush, and perennial upland grasses; scattered juniper sometimes present ¹⁵
Plant Density and Size	High shrub density preferred; shrub canopy height usually < 5 feet ¹⁵
Microhabitat Features	Nest shrub height typically 1.5 – 3 feet; bare ground avoided ¹⁵
Landscape	Reproductive success lower in landscapes fragmented by agriculture ⁸ ; edges with trees may be avoided

Elevation Range in Arizona

4,300 – 7,400 feet²³

Density Estimate

Territory Size: 1.5 – 6 acres¹⁵
Density: 20 – 80 birds/100 acres¹⁵

Natural History Profile

Seasonal Distribution in Arizona

Breeding	Mid-April – July ²³
Migration	March – May; August – early October
Winter	Mid-September – March ²³

Nest and Nesting Habits

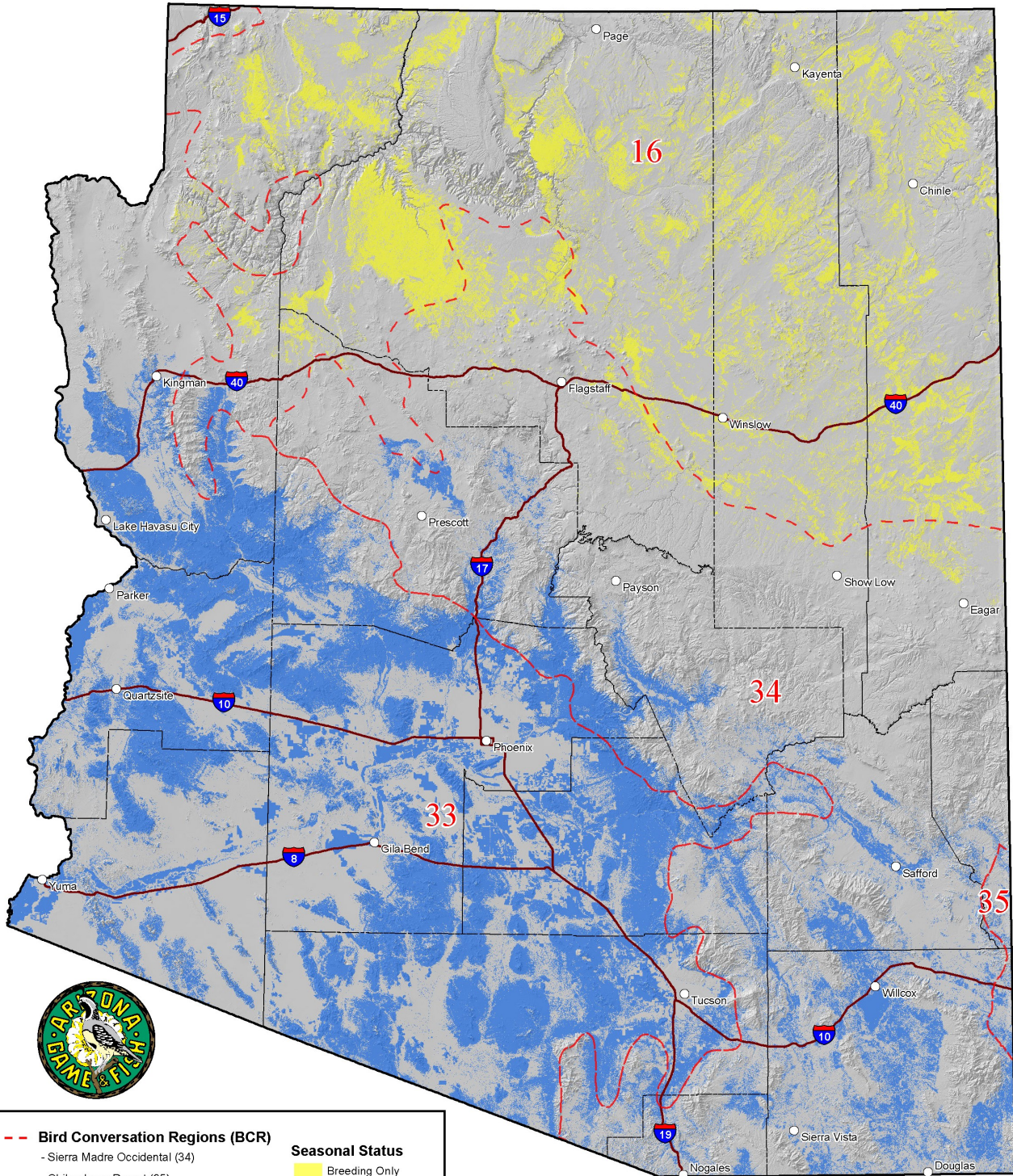
Type of Nest	Cup ¹⁵
Nest Substrate	Big sagebrush, snakeweed, wolfberry ^{15,23}
Nest Height	1 – 5 feet ²³

Food Habits

Diet/Food	Insects; seeds in winter ¹⁵
Foraging Substrate	Mostly shrubs ¹⁵



Distribution of Brewer's Sparrow



-- Bird Conservation Regions (BCR)

- Sierra Madre Occidental (34)
- Chihuahuan Desert (35)
- Sonoran & Mojave Deserts (33)
- Southern Rockies & Colorado Plateau (16)

Seasonal Status

- Breeding Only
- Winter Only
- Counties

This map represents the predictive distribution for an individual species. AZGFD warrants no guarantees of accuracy or currency of the data represented.



General Information

Distribution in Arizona

In Arizona, Brewer's Sparrows nest north of the Mogollon Rim and north of the Grand Canyon, with scattered populations ranging south to northern Yavapai County (Wise-Gervais 2005). They also migrate widely across Arizona in open shrublands, and they winter in the desert scrublands of western and southern Arizona (Rotenberry et al. 1999). Brewer's Sparrows are near the southern edge of their breeding range in Arizona (Rotenberry et al. 1999). Preliminary BBS data suggest that much of Arizona's breeding population has declined and may have contracted northward during the past two decades as drought conditions continue across the state (T. Corman, pers. comm.)

Habitat Description

Brewer's Sparrows nest exclusively in cold-temperate desertscrub throughout their range, including primarily sagebrush in the northern regions, but also in saltbush, shadscale, and greasewood (Wiens and Rotenberry 1981). They are strongly associated with open sagebrush country, including shrubby foothills and rolling brushy terrain (Wise-Gervais 2005). Little research has been done on the habitat use of southwestern populations of Brewer's Sparrow, but LaRue (1994) found the species to be abundant in sagebrush and saltbush on the Black Mesa, and it reached especially high densities in saltbush (80 – 160 birds/100 acres). In other parts of their range, their breeding densities were highest in 2 – 3 foot tall greasewood and sagebrush stands (Williams et al. 2011). High shrub cover appears to be critical for territory selection of Brewer's Sparrows (Knick and Rotenberry 1995), but recommendations for percent shrub cover are not available.

Microhabitat Requirements

Brewer's Sparrows nest in live, relatively dense shrubs that are typically 2.5 feet tall, often taller than other shrubs in the area (Rotenberry et al. 1999). Brewer's Sparrows forage mostly in sagebrush shrubs that are larger and more vigorous than average shrubs and provide insect prey (Rotenberry et al. 1999). Critical features of both microhabitats appear to be shrub vigor, which provides a dense cover for the nest, and insect populations used for prey.

Landscape Requirements

Area requirements, effects of fragmentation, and disturbance distances have not been studied for Brewer's Sparrows, but the species is most abundant in large habitat patches (Knick and Rotenberry 1995).



Conservation Issues and Management Actions

Threats Assessment

This table is organized by Salafsky et al.'s (2008) standard lexicon for threats classifications. Threat level is based on expert opinion of Arizona avian biologists and reviewers. We considered the full lexicon but include only medium and high threats in this account.

Threat	Details	Threat Level
Agriculture <ul style="list-style-type: none"> Livestock farming and ranching 	Grazing can degrade habitat quality	Medium
Natural System Modifications <ul style="list-style-type: none"> Fire and fire suppression Other ecosystem modifications 	Fires can spread invasive plant species, creating monocultures	High
Invasive and Problematic Species <ul style="list-style-type: none"> Invasive non-native/alien species 	Increase in cheatgrass leads to increased fire regimes and fragmentation	High
Climate Change <ul style="list-style-type: none"> Ecosystem encroachment Changes in precipitation and hydrological regimes (drought) 		High

In the following section we provide more detail about threats, including recommended management actions. Threats with similar recommended actions are grouped.

Agriculture:

- Livestock farming and ranching

In much of the Brewer's Sparrow's range, historic habitat losses are attributed to removal of big sagebrush in the second half of the 20th century to increase grass and forb cover for livestock (Paige and Ritter 1999). Livestock grazing can degrade habitat by reducing vigor of sagebrush and other shrubs. Sustained grazing is also detrimental when it chronically removes understory vegetation and seedlings and when it affects soil integrity (Young 1994, Paige and Ritter 1999).

Recommended Actions:

- Determine the extent of habitat degradation and livestock grazing in areas occupied by Brewer's Sparrows.
- Manage livestock use at sustainable levels that avoid loss of shrub vigor in Brewer's Sparrow habitat.
- For treatments that remove native shrubs, undertake work in narrow strips or small blocks to maintain a mosaic pattern of edge and useable habitat.
- Reduce livestock grazing impacts by allowing grazing primarily during the plant's dormant season and protecting the current season's growth from grazing through the nesting season (GBBO 2010).



5. Manage for at least 50% of annual vegetative growth to remain (Paige and Ritter 1999)

Natural System Modifications:

- Fire and fire suppression

Fire is detrimental to Brewer's Sparrows if intact shrublands are lost at a landscape scale and before full recovery from previous disturbances, or if native understory plants are destroyed beyond recovery (Baker 2006).

Recommended Actions:

1. Consider fire suppression for areas where there is a threat of exotic annual plant invasion (Great GBBO 2010).

Natural System Modifications:

- Other ecosystem modifications

Invasive and Other Problematic Species and Genes:

- Invasive non-native/alien species

The loss of shrub steppe habitat has accelerated because of complex interactions among livestock grazing, invasion of exotic annual plants, climate change, and fire dynamics. Cheatgrass invasions have increased fire frequency and substantially altered post-fire succession to result in lower shrub cover (Rotenberry 1998).

Recommended Actions:

1. Remove exotic annual plants that have become self-perpetuating for long-term shrubland conservation.
2. Move activities that promote establishment of cheatgrass, such as heavy livestock grazing or OHV use, to areas that are already degraded.

Climate Change:

- Ecosystem encroachment
- Changes in precipitation and hydrological regimes (drought)

Brewer's Sparrows are declining by 2% annually in the Colorado Plateau region, but sample sizes are too low for a trend estimate for Arizona (Sauer et al. 2012). Range-wide declines are generally attributed to the loss and fragmentation of intact shrublands. Prolonged droughts resulting from climate change have the particular risk of losing shrub vigor and increasing shrub mortality, which directly impacts the availability of Brewer's Sparrow nesting and foraging microhabitats.

Recommended Actions:

1. Conduct additional monitoring to determine Brewer's Sparrow population status and trends in Arizona.
2. Develop and implement a habitat assessment and monitoring protocol that includes shrub vigor metrics as a measure of habitat quality to document effects of prolonged droughts and climate change.



Recommended Actions:

1. Consider fire suppression in areas where there is a threat of exotic annual plant invasion (GBBO 2010).

Research and Monitoring Priorities

1. Clarify Brewer's Sparrows sensitivity to habitat fragmentation and minimum patch sizes requirements.
2. Determine status and conservation issues of Brewer's Sparrow on winter grounds, including Arizona and Sonora.
3. Conduct additional multi-species-protocol monitoring to determine population trends in Arizona.

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³Department of Defense. 2012. DoD PIF Mission-Sensitive Priority Bird Species. Fact Sheet #11. Department of Defense Partners in Flight Program.

⁷GBBO (Great Basin Bird Observatory). 2010. Nevada Comprehensive Bird Conservation Plan, ver. 1.0. Great Basin Bird Observatory, Reno, NV.

⁸Knick, S.T., and J.T. Rotenberry. 1995. Landscape characteristics of fragmented shrubsteppe habitats and breeding passerine birds. *Conservation Biology* 9:1059 – 1071.

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^{5a}Partners in Flight. 2019. Avian Conservation Assessment Database, version 2019. Accessed on March 31, 2020.

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Recommended Citation

Arizona Bird Conservation Initiative and Sonoran Joint Venture. 2023. Brewer's Sparrow (*Spizella breweri*) Species Account. Available at <http://sonoranjv.org/accounts/brewers-sparrow.pdf>

