

BLACK-THROATED SPARROW

Amphispiza bilineata

Description

Amphispiza bilineata deserticola breeds in western Colorado (Johnson et al. 2002).

The black-throated sparrow is a medium-sized sparrow, with a black throat and breast, white malar stripe, and prominent white supercilium. The wings, back, and rump are sandy-brownish, and the tail is brownish black with white-tipped outermost feathers. The belly grades from whitish buff up around the black “bib” to brownish gray below. The legs are dark gray and the bill is dark gray with a paler bluish-gray lower mandible. The iris is dark brown. The sexes are similar in coloration (Rising 1996). Nine subspecies are recognized (Johnson et al. 2002).

Life history & behavior

An obligate shrub nester and ground-foraging opportunistic omnivore.

Black-throated sparrows arrive on their breeding grounds during April and depart by early September (Righter et al. 2004). Nesting birds were recorded by Colorado BBA between May 12th and July 16th (Lambeth 1998). Well-concealed nests are placed in or under shrubs. Clutch size is typically 3 to 4 eggs, with hatching about 12 days after incubation commences by the female. The young fledge before they can fly, about 10 days after hatching, and are fed by both parents for up to two weeks after departure from the nest. Black-throated sparrows are known to double brood (Johnson et al. 2002), but double-brooding remains undocumented in Colorado populations.

Limited data demonstrate the black-throated sparrow shows some degree of fidelity to breeding territories and wintering grounds (Johnson et al. 2002).

The black-throated sparrow forages on the ground and gleans opportunistically from low foliage, near or under shrubs. It feeds primarily on invertebrates during breeding season and seeds or new sprouts of grasses and forbs during non-breeding periods (Johnson et al. 2002; Parker 1986). The species is physiologically adapted to low water intake and can exploit food sources to maintain its water balance (Ryser 1985; Smyth and Bartholomew 1966).

During winter, black-throated sparrows associate in loose flocks with sage sparrows, white-crowned sparrows, vesper sparrows, and Brewer’s sparrows (Johnson et al. 2002).

Unlike many other sparrows, male black-throated sparrows do not necessarily sing from prominent perches, but often deliver their songs from the middle of a shrub or on the ground (Heckenlively 1967). When frightened, they often dart away on the ground instead of flying (Bailey and Niedrach 1965; Johnson et al. 2002).

Black-throated sparrows use rodent burrows to escape midday heat (Austin and Smyth 1974). Rodents and ants may help facilitate visual foraging opportunities for black-throated sparrows by creating bare areas and runways on the ground; black-throated sparrow abundance declined over the long-term at a study site in the Chihuahuan Desert with the experimental removal of rodents and ants (Thompson et al. 1991).

Population trends

Potentially in decline rangewide.

Colorado trends tracked by MCB are as yet uncertain (T. Leukering, pers. comm.).

Interpret BBS data with caution; the species is not sampled with statistical confidence in Colorado.

Standard BBS trend estimates (Sauer et al. 2004) show long-term declines of black-throated sparrows in every BBS region sampled. The following are selected annual average BBS trend estimates for the period of 1966 through 2003:

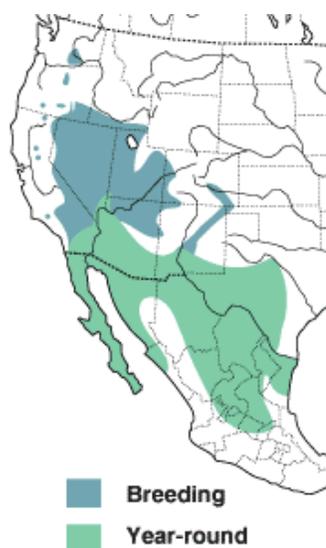
- 4.2% survey-wide ($P < 0.01$, $n = 311$, $RA = 11.5$)
- 2.3% in western region ($P = < 0.01$, $n = 267$, $RA = 14.04$)
- 4.5% in Colorado ($P = 0.72$, $n = 3$, $RA = 0.01$)

A recent spatial analysis by Dobkin and Sauder (2004) comparing BBS data between two periods (1963 through 1983 and 1984 through 2001) suggests that black-throated sparrows may have increased in abundance in the western U.S.; areas predicted to have >5 birds per route expanded by 6 percent in the western U.S. and by 18 percent in the shrubsteppe provinces. This expansion did not include Colorado, where comparison of detection frequencies on BBS routes during the same periods suggests stable numbers, but detection rates were low.

Range

The black-throated sparrow remains extant in all states where it historically occurred.

Overall range map reproduced from Johnson et al. 2002 with permission.



The black-throated sparrow breeds in southern California, the Great Basin, on portions of the Columbia and Colorado Plateaus, and across Arizona, New Mexico, and west Texas (Johnson et al. 2002). BBS data suggest centers of abundance are southern Nevada, southeastern Arizona, and southwestern New Mexico (Sauer et al. 2004).

In winter, the subspecies *deserticola* typically retreats to the southern extent of its breeding range (Johnson et al. 2002).

Colorado distribution patterns & abundance

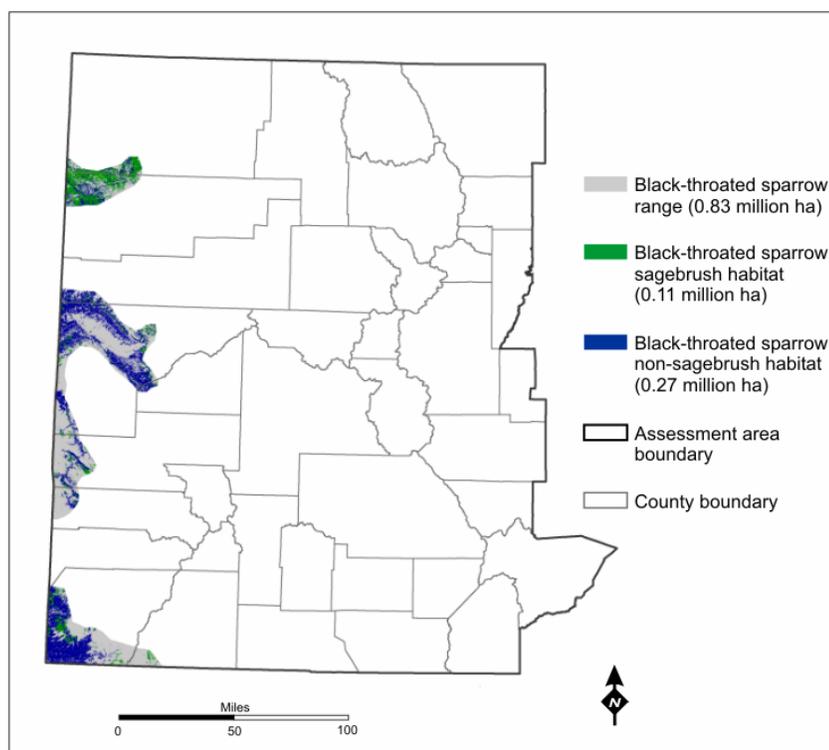
In western Colorado, black-throated sparrows nest most commonly at elevations below 5,500 feet (Righter et al. 2004).

The range of the black-throated sparrow in the assessment area encompasses approximately 831,000 ha with about 380,000 ha of suitable habitat.

Black-throated sparrow distribution was negatively correlated with sage sparrow in one regional-scale northwestern Great Basin study (Wiens and Rotenberry 1981).

The black-throated sparrow (subspecies *deserticola*) is at the northeast edge of its breeding range in Colorado. Breeding black-throated sparrows were detected by the Colorado BBA project in nine western Colorado counties, and confirmed in four. Populations centered around the Rangely, Grand Junction, Gateway, Naturita, and Cortez areas. Centers of abundance were south and west of Cortez (Lambeth 1998). Andrews and Righter (1992) and the Colorado BBA (Lambeth 1998) show similar breeding distribution of this species; however, Andrews and Righter indicate records in low elevation areas of Delta County where the Colorado BBA project detected none.

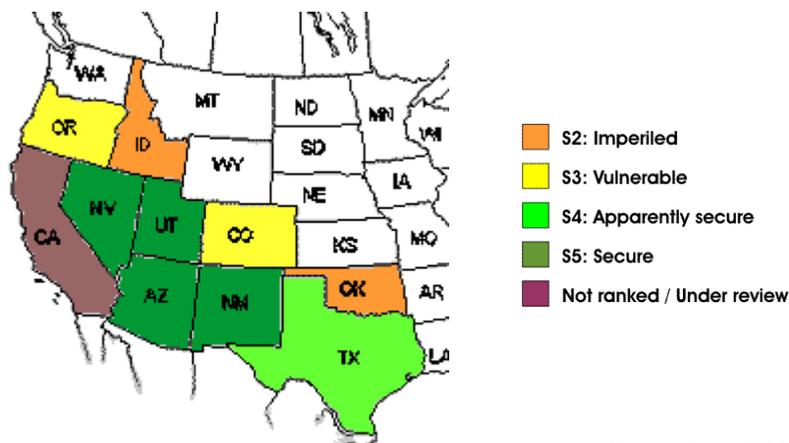
Numbers of this species recorded by MCB in Colorado between 1999 and 2003 were too low to calculate reliable density estimates (T. Leukering, pers. comm.). Breeding bird densities summarized by Johnson et al. (2002) are 11 to 24 birds per km² in desert scrub and 19 to 24 birds per km² in “heavily grazed” early winter shadscale in Utah; 19 to 56 birds per km² across a variety of shrubland types in Arizona; and 10.5 birds per km² in southern New Mexico. Wiens and Rotenberry (1981) estimated densities of black-throated sparrows (where birds were present) in northwest Great Basin sagebrush shrubsteppe at 2 to 74 birds per km².



Conservation status

Ranked G5/S3, “demonstrably secure” rangewide and “vulnerable” in Colorado (NatureServe 2004).

BLM species of concern in Idaho; State species of concern in Oregon; no legal status in any state.



Map courtesy of NatureServe (2004).

Habitat

The black-throated sparrow breeds in semi-open, arid tall desert and semi-desert shrublands.

In the Colorado sagebrush assessment area, about 0.38 million ha of suitable habitat exists for black-throated sparrow, 0.11 million ha of which is sagebrush shrublands (see figure in Colorado Distribution Patterns and Abundance).

Minimum patch size and habitat connectivity requirements for black-throated sparrow are unknown. Lambeth (1998) suggested that this species “can utilize small patches of habitat” based on occurrences of

The black-throated sparrow breeds in a variety of desert, semi-desert, and chaparral shrublands across its range. In western Colorado, black-throated sparrows favor open arid country with scattered shrubs such as Utah juniper, sagebrush, spiny hopsage, blackbrush, or greasewood (Lambeth 1998; Righter et al. 2004).

In the northwestern Great Basin sagebrush shrubsteppe, black-throated sparrow abundance was positively correlated with shrub species richness; bird densities varied with coverage of spiny hopsage and shadscale (Wiens and Rotenberry 1981).

The Colorado BBA project recorded the species in 8 vegetation classes, with about 18 percent in lowland sagebrush habitat, 26 percent in tall desert shrublands, and about 33 percent in pinyon-juniper woodlands, typified by widely spaced junipers (Lambeth 1998). The breakdown of Colorado BBA occurrences is as follows:

- 33% - pinyon-juniper woodlands
- 26% - tall desert shrublands
- 18% - lowland sagebrush
- 9% - mat saltbush
- 5% - shortgrass prairie
- 3.5% - montane grassland
- 3.5% - lowland riparian
- 2% - oak scrub

According to information synthesized by Johnson et al. (2002), black-throated sparrows prefer evenly spaced shrubs, 1 to 3 m in height, and less than 25 percent total vegetative cover. Nest shrubs average 87 to 189 cm in height, and nest placement averages from 29 to 47 cm above the ground. In southern Arizona, three nests were reported in mistletoe, with an average nest height of 233 cm in host trees. No data are available regarding this species’ requirements for shrubland understory floristic composition or physiognomy.

In southern Arizona and New Mexico, breeding territory size ranged from

isolated pairs observed by the Colorado BBA project.

0.012 to 2.36 ha (Heckenlively 1967; Johnson et al. 2002). Breeding territories may vary in size with vegetation characteristics or bird densities, but there are no data to support these hypotheses.

During spring and fall migrations, black-throated sparrows use shrubland habitats structurally similar to their breeding habitats (Johnson et al. 2002). On their winter range, black-throated sparrows occur in lower desert valleys and desert washes in creosote bush, mesquite, cactus shrub, sagebrush, arid grasslands, and pinyon-juniper woodlands (Johnson et al. 2002).

Threats & Sensitivities

In western Colorado, where sagebrush makes up about 30 percent of black-throated sparrow suitable habitat, threats to sagebrush are a significant concern.

See [Chapter 6](#) for more detail about black-throated sparrow habitat estimates and predictive threats modeling for its sagebrush habitat in the Colorado assessment area. [Chapter 4](#) presents rule sets for threats modeling in sagebrush habitat.

The greatest threat facing the black-throated sparrow in its breeding range is probably habitat loss due to burgeoning human populations and development in the desert southwest. Numbers of breeding birds are thought to be reduced near human populations even if appropriate nesting vegetation is present (Johnson et al. 2002).

In western Colorado, where sagebrush makes up about 30 percent of black-throated sparrow suitable habitat, loss and degradation of sagebrush are major concerns. Black-throated sparrow sagebrush habitat in Colorado is at risk of four widespread threats modeled in the Colorado sagebrush conservation assessment and strategy: pinyon-juniper encroachment, encroachment by invasive herbaceous plants, residential development, and energy development. Residential development probably poses the lowest threat of the four, with less than 1 percent of black-throated sparrow sagebrush habitat at high or moderate risk, 6 percent at low risk, and 93 percent at no risk.

Pinyon-juniper encroachment is not anticipated to be a serious threat to the black-throated sparrow in the short-term because the species tolerates scattered trees in its habitat. Our predictive model estimated 69 percent of black-throated sparrow sagebrush habitat is at high risk of pinyon-juniper encroachment, while 31 percent is at moderate or low risk, and less than 1 percent is at no risk. Complete conversion of sagebrush habitats to mature pinyon-juniper woodlands could result in a loss of black-throated sparrow habitat.

Risk of energy development is broadly moderate throughout the Colorado sagebrush assessment area. About 15 percent of black-throated sparrow sagebrush habitat is at high risk of energy development, 76 percent is at moderate risk, and 8 percent is at low or no risk. Energy development can result in destruction, degradation, and fragmentation of habitat via mechanisms described in [Chapter 2](#). Black-throated sparrow sagebrush habitat at highest risk of energy development lies in northwest Rio Blanco County.

Over 99 percent of black-throated sparrow sagebrush habitat is at some degree of risk of encroachment by invasive herbaceous plants. Our model predicts 69 percent at high risk, 27 percent at moderate risk, and 4 percent at low risk. The effects of invasive herbaceous encroachment on black-throated sparrow sagebrush habitat quality have not been studied. High percent ground cover and nearly monotypic stands that often characterize non-native herbaceous understories could physically interfere with foraging habits or

<p>The black-throated sparrow's response to sagebrush range treatments are likely positive where the shrub component is not completely removed.</p>	<p>impact plant or invertebrate food sources of this ground-foraging omnivore that prefers less than 25 percent total vegetative cover. Fire-accelerated conversions of shrublands to non-native annual grasslands or forblands could result in permanent habitat loss (Knick 1999).</p>
<p>The effects of habitat fragmentation on black-throated sparrows are unknown.</p>	<p>Black-throated sparrows probably respond positively to sagebrush range treatments where complete removal of shrubs is not the treatment objective and resulting herbaceous cover is not excessively dense. The toxicity to black-throated sparrows of herbicides applied to sagebrush and their effects on nesting success are unknown. Woody fuel build-up could result in intense fires that destroy woody plants and ground cover, making habitat unsuitable in the short- and mid-term for nesting black-throated sparrows (Johnson et al. 2002).</p>
<p>The effects of livestock grazing on black-throated sparrows depend on habitat type and grazing density. No data exist regarding the species' response to grazing in sagebrush habitat.</p>	<p>No long-term, comprehensive studies comparing avifaunas of ungrazed and grazed sagebrush shrubsteppe habitats exist for Colorado or elsewhere. A literature review by Bock et al. (1993) concluded that black-throated sparrows are either unresponsive or show mixed responses to grazing in shrubsteppe. Black-throated sparrows may benefit where grazing reduces total vegetative cover below 25 percent, but there are no data supporting this hypothesis. In semi-desert grasslands in Arizona, black-throated sparrows were more abundant in grazed plots than within ungrazed exclosures (Bock et al. 1984). Exclosures supported grasses at 80 percent cover, grazed areas supported about 56 percent grass cover, and shrub cover was similar between grazed and ungrazed plots. In Colorado, black-throated sparrow distribution is probably mostly restricted to habitats without potential for high grass cover (Lambeth, pers. comm.). Livestock grazing is potentially associated with the introduction of exotic plants (effects on black-throated sparrows are unknown) and higher densities of parasitic cowbirds in shrubsteppe habitats. Livestock may trample or disturb nests (Paige and Ritter 1999).</p>
<p>Cowbird parasitism appears to affect nest success of black-throated sparrows (Johnson et al. 2002).</p>	<p>Black-throated sparrows may abandon nests parasitized by cowbirds. In an Arizona study, removal or damage of black-throated sparrow eggs by cowbirds significantly reduced black-throated sparrow clutch size, and only 15 percent of parasitized nests were successful compared with 48 percent of unparasitized nests. In a New Mexico study, no parasitized nests produced young. However, brood parasitism by cowbirds on black-throated sparrows in general is expected to be relatively low, since black-throated sparrows tend to nest away from urban, agricultural, and riparian areas (Johnson et al. 2002).</p>
	<p>Snakes, spotted ground squirrels, road runners, loggerhead shrikes, prairie falcons, coyote, and ravens are documented predators on black-throated sparrow eggs or young. Predation appears to account for many nest failures in Arizona and New Mexico (Johnson et al. 2002). Nestlings are sensitive to human intrusion near the end of the nestling period and may fledge early if disturbed by researchers (Johnson et al. 2002).</p>

Research needs

Black-throated sparrow population trend monitoring should be coupled with investigation of nest success (including brood parasitism and predation) under alternate rangeland management regimes, over a spectrum of habitat conditions and geographic areas in Colorado. Further study is needed to better understand the effects of grazing on habitat, abundance, and productivity of black-throated sparrows in Colorado's sagebrush shrublands.

Information is needed regarding landscape-scale patterns of habitat use, effects of habitat fragmentation, and patch size and habitat connectivity requirements of the black-throated sparrow.

The degree of breeding territory fidelity of black-throated sparrows is not well documented. Study is needed to better understand wintering ecology and whether winter mortalities are affecting Colorado's breeding populations.

Management issues

About 73 percent of black-throated sparrow sagebrush habitat in the Colorado sagebrush assessment area is managed by the BLM, making it the public entity best-positioned to have a positive impact on the species. The limited range of black-throated sparrow in Colorado may make it better suited for management at the local, rather than regional, scale.

Our threats analysis did not consider non-sagebrush vegetation types, which provide a significant amount (about 70 percent) of the black-throated sparrow's habitat. Ideally, conservation planning and management of species of concern should consider all primary habitat types. Such an approach is beyond the scope of this assessment.

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