

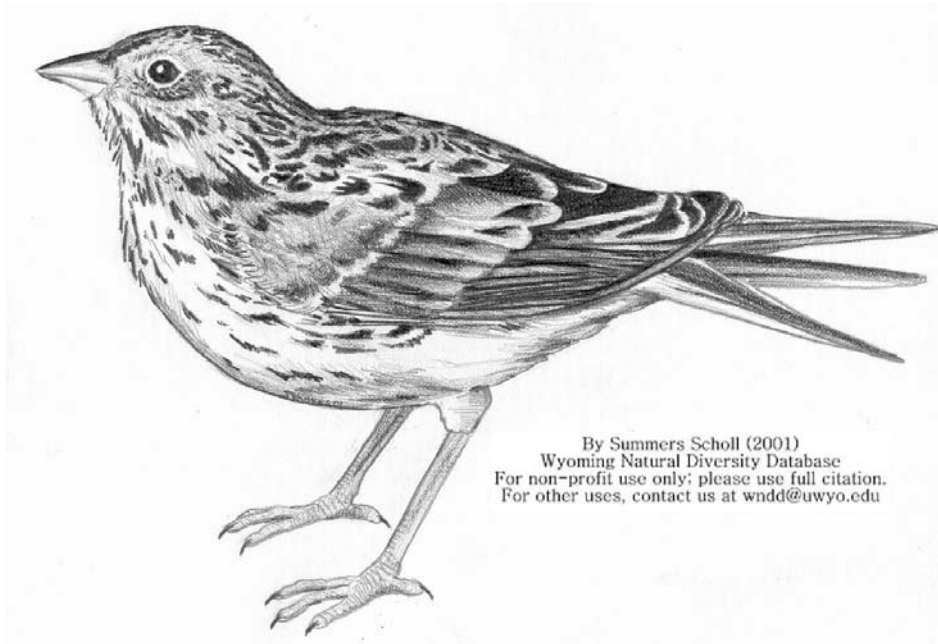
SPECIES ASSESSMENT FOR BAIRD'S SPARROW (*AMMODRAMUS BAIRDII*) IN WYOMING

prepared by

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Introduction

This Species Conservation Assessment was prepared as part of a Species Conservation Project funded by the Wyoming Bureau of Land Management. It represents a complete review of the current published information available for the species, includes consultation with experts, and presents existing information on the distribution, biology, ecological niche, and conservation planning being conducted for this species on a state and range-wide level. The reader will note that there are a number of areas in which biological and ecological data are not well known for this species. Wyoming abundance and distribution data are based on relatively few observation records. The Wyoming Bird Records Committee has reviewed and accepted six of the 11 records shown in the Wyoming Bird and Mammal Atlas (Luce 1999). There is a recent Rocky Mountain Bird Observatory breeding record on Thunder Basin National Grassland (Cerovski, pers. comm.). Therefore, breeding is confirmed in two latilongs, and occurrence in eight. However, the major occurrence of Baird's Sparrow (*Ammodramus bairdii*) in Wyoming is during migration. The Wyoming Bird Conservation Plan lists Baird's Sparrow as peripheral and Native Species Status 4. The ecological value of eastern Wyoming grasslands as Baird's Sparrow migration stopover habitat has not been quantified.

Continued collection and refinement of data, state and federal agency recognition of the need to manage this species, and state and federal development and implementation of effective management strategies for grasslands may be major factors in preventing future need to reexamine the status of this species for listing under the Endangered Species Act.

Natural History

Morphological Description

Identification

Baird's Sparrow is a small, brownish, streaked passerine (subdivision oscine) sparrow, similar and related to Grasshopper Sparrow (*Ammodramus savannarum*) and Savannah Sparrow (*Passerculus sandwichensis*). The sexes are similar. Length averages about 12 cm (range = 13.5-14.2 cm), and mass about 19 g. Average body mass of breeding males in North Dakota was 19.1 g (SD = ± 1.0 ; range = 17.0-21.3 g (Jones and Green 1997) and 17.8 g for females and 18.9 g for males in Alberta (Maher 1979). Wing length is 7.0-7.6 cm and tail length is 5.3-5.8 cm.

The top of the head and nape are brownish yellow, striped with black, especially on the sides of the crown and nape (Figure 1). The sides of the head and neck are pale buff and flecked with black. There is a narrow line of black spots on the side of the throat. Back feathers are dull black centrally with grayish-white margins, thus appearing streaked. The rump is lighter and buff-colored. Under parts are white or buff on the throat and breast, streaked on the sides, flanks, and breast with black. The streaks on the breast form a necklace or collar, whereas the sides are less distinct and tinged with rufous. Wing feathers are grayish-brown, coverts are darker centrally, and all have edges of pale rufous. There are two indistinct pale wing bars. Tail is dull brown or blackish, with the middle pair of tail feathers narrower and more pointed. Outer tail feathers are edged with white and terminally white. The bill is flesh-colored, darker at the tip; legs are flesh-colored, with the feet slightly darker. Juveniles resemble adults, but markings are less distinct and the buff of head and nape is paler (Peterson 1990, Rising 1996, Howell and Webb 1999, Sibley 2000, Green et al. 2002).

Diagnostic field marks: Broad, ochre median crown stripe and narrow band of fine black streaks across the breast; head yellow-brown and streaked (Peterson 1990). Relatively large-billed sparrow with longer and squarer tail than similar species, ochre color on head and dark spots on neck are distinctive (Sibley 2000). Green et al. (2002) also report the notched tail is diagnostic.

Vocalization

The song has been described as consisting of two, three or more “zips” followed by a lower pitched trill (The Nature Conservancy 1997). Sibley (2000) describes the song as a high, clear jingling: several high clear *tink* notes followed by a clear musical trill. The call is a very high, weak *teep*, and the flight call is a high thin *tsee* (Sibley 2000). Each male sings only 1 of 13 distinct song types recorded for the species (Green 1992, Green et al. 2002); song types are not regionally distinct, but rather are interspersed throughout the breeding range.

Taxonomy and Distribution

Taxonomy

Baird’s Sparrow taxonomic hierarchy is as follows: Class: Aves, Order: Passeriformes, Family: (Emberizidae) Fringillidae, Genus: *Ammodramus* Swainson, 1827; and Species: *Ammodramus bairdii* (Audubon 1844).

There are currently no unsettled taxonomic issues. Originally known as *Emberiz bairdii* (Audubon 1844). See Murray (1968) for nomenclature history. Baird’s Sparrow was at one time placed in a separate genus, *Centronyx*, when thought more closely related to the Grasshopper Sparrow (*A. savannarum*) (Ridgway 1901 in Green et al. 2002).). Currently, the closest relative is thought to be Henslow’s Sparrow (*A. henslowii*) (Zink and Avise 1990). There are no subspecies

designated (AOU 1998). The type specimen was collected near Old Fort Union, Williams County, North Dakota in 1843. This was the last bird species described by Audubon, and was the first of several bird species named for Spencer Fullerton Baird, a nineteenth century ornithologist (Green et al. 2002). The species was not recorded again until 1872 when a specimen was taken in Colorado. The first nest was found in 1874 (Allen 1874 *in* Green et al. 2002).

Distribution and Range

Breeding Range

Baird's Sparrow breeds in southern Alberta where it is common (south of Stettler and east of Red Deer River, west to Calgary, and north to Elk Island Park (Godfrey 1986 *in* Green et al. 2002, Semenchuk 1992 *in* Green et al. 2002); southern Saskatchewan north to Manito Lake, Redberry Lake and Nipawin; and in Mixed, Moist-mixed Grassland and Cypress Upland ecoregions north to Saskatoon; grassland pockets in Aspen Parkland region (Godfrey 1986 *in* Green et al. 2002, Davis et al. 1996); and southern Manitoba (Figure 2). In the United States, breeding occurs in central and eastern Montana as far west as Teton County (Montana Bird Distribution Committee 1996 *in* Green et al. 2002); in the glaciated hill region of North Dakota east of the Missouri River in the northwest and central parts of the state (Stewart 1975 *in* Dechant et al. 2001), northwestern and north-central South Dakota (South Dakota Ornithologists Union 1991); and possibly western Minnesota in Clay County, Pennington, and Polk Counties (Coffin and Pfanmuller 1988).

Confirmed breeding records exist for eastern Wyoming in Latilongs 13 and 27 which include parts of Laramie, Platte, Albany, Converse and Campbell Counties (Luce et al. 1999). Occurrence, probably during migration, is suspected in 8 additional latilongs (Luce et al. 1999). Unconfirmed but possible breeding records also exist for Manitowoc County, Wisconsin (Robbins 1991 *in*

Green et al. 2002); western Ontario (Lemey 1981 *in* Green et al. 2002); northwestern Nebraska (Sharpe et al. 2001).

Winter Range

Typical winter range habitat is shown in Figure 3. Baird's Sparrow winters in extreme southeastern Arizona (Sonoita Plains, Altar and San Rafael Valleys, base of Chiricahua, Huachuca, Santa Rita, and Patagonia Mountains (Monson and Phillips 1981, Gordon 2000a); casually in southern New Mexico (Hubbard 1978); and on the high plains grasslands of southwestern Texas (Trans-Pecos) (Oberholser 1974). In Mexico, winter range is northeastern Sonora (Russell and Monson 1998), northwestern Chihuahua, northeastern Durango, and extreme northern Zacatecas (Howell and Webb 1999, AOU 1998).

Casual Records

Migration records occur rarely east or west of the Great Plains migration corridor. Other accidental records include British Columbia, California, Oklahoma, New York, and Maryland. Single records occur in Ohio, Ontario, West Virginia, and Illinois (Green et al. 2002).

Historical Records

The overall breeding distribution has changed little from historical. except that it formerly bred in northwestern Minnesota but is now limited to a small native prairie in Wilkin County, Minnesota and Grand Forks County, North Dakota (Coffin and Pfanmuller 1988, De Smet and Miller 1989). Also, it formerly occurred farther east in Manitoba but is now restricted to southwestern Manitoba (Green et al. 2002). Formerly wintered north to Graham County, Arizona, but now restricted to Cochise, Pima, and Santa Cruz Counties (Monson and Phillips 1981, Gordon 2000a).

Abundance

Once considered one of the most common prairie birds in some areas, Baird's Sparrow is now rare throughout its range and only abundant in local areas with suitable grassland habitat. Baird's Sparrow is common in the Missouri Coteau region of North Dakota (Stewart 1975 *in* Dechant et al. 2001), for instance.

Population Trend

Population numbers dramatically declined from the 1800's when (Coues 1874 *in* Jones and Green 1997) called Baird's Sparrow "one of the most abundant species in the Dakota Territory." The North Dakota population of Baird's Sparrow had an average density of 0.8 pairs/40 ha in 1967, and the estimated population was 376,000 pairs (95% CI: 208,000-543,000)(Stewart and Kantrud 1972. In 1992, Igl and Johnson (1997) estimated the statewide population at 279,000 pairs (140,000-418,000)), while in 1993, the same study design estimated 171,000 pairs (90,000-251,000). Knopf (1994) suggested that distribution in any given year might be tied to precipitation patterns, as is the case with many grassland birds. The year 1992 was a dry year, and 1993 a wet year. During the period 1966-1979, Baird's Sparrow data showed apparent declines (not all were statistically significant) in all of its range except Montana. Likewise there was an apparent downward trend (mean annual percent change) in the continental population as documented by BBS (Sauer et al. 1996). The declines were significant in 46% of the areas analyzed and the decline for the entire survey was significant as well. These declines occurred in the Northern Great Plains, an area with historic large Baird's Sparrow populations. De Smet and Miller (1989) suggest that BBS data for 1970-1985 for the population in Canada may show as much as a 35-55% decline. For the period 1980-1996 trends were level in most areas, and a significant increase was observed in the Glaciated Missouri Plateau region. The average BBS trends over the period 1966-

1996 showed the population to be stable over 115 routes (Sauer et al. 1996). Sauer et al. (2003) showed a (-4.1 %, p=0.00, n=55; CI= -6.6% to -1.5%) downward trend for the U.S. from 1996 to 2002. Local population fluctuations continue to occur and threats to some populations may exist (Janssen 1987, De Smet and Miller 1989).

Habitat Requirements

General

Non-breeding habitat (late fall and winter) includes overgrown fields and open grasslands. Birds prefer areas of taller, dense grasses during all seasons, but can be found on south-facing slopes of mixed-oak grassland where oaks occur on north-facing slopes (The Nature Conservancy 1997). Dechant et al. (2001) and Green et al. (2002) provide complete reviews of Baird's Sparrow habitat characteristics.

Spring/Summer/Fall (Breeding Season)

On the breeding grounds, Baird's Sparrow prefers idle or lightly to moderately grazed native grasslands (Cartwright et al. 1937 *in* Jones and Green 1997). Preferred habitat may change from year to year depending on whether it is a wet or dry year. In dry years, or in the drier parts of the range, breeding occurs in grassy sloughs, alkali flats, and depressions in low lying grasslands (Salt and Wilk 1958 *in* The Nature Conservancy 1997, Kantrud and Kologiski 1982). In northwestern North Dakota the best native habitat is grasslands with litter up to 2 cm deep, < 10% woody cover, a relatively high percentage of forbs (20%), vegetation with an average height of 23 cm, and a mosaic of forbs, bare soil, and grasses (Winter 1994 *in* Green et al. 2002). Grasslands with Baird's Sparrow territories had significantly deeper litter than those without territories (21.19 cm versus

0.87 cm). Sites with >25% shrub cover were avoided. Dale (1983 *in* Green et al. 2002) and Sousa and McDonal (1983 *in* Green et al. 2002) noted that Baird's Sparrow prefers native grasslands with shrub cover <20%, litter depth up to 3-4 cm deep, and grass height 10-20 cm or higher. Baird's Sparrow will use perches in living or dead shrubs (Lane 1968 *in* Green et al. 2002). Baird's Sparrow nests in Montana were an average of 67.9 m (range = 6-365 m) from the nearest perch at least 1 m high (Davis and Sealy 1998).

In Alberta, Baird's Sparrow frequented undisturbed native grasslands comprised of rough fescue (*Festuca scabrella*), sedge (*Carex obtusata*), porcupine grass (*Stipa spartea*), club moss (*Selaginella densa*) and spike oat (*Helictotrichon hookeri*) (Owens and Myres 1973). While breeding Baird's Sparrow prefers native grasslands, it also uses seeded pastures and hayfields (Davis et al. 1996), wheat fields (Lane 1968 *in* Green et al. 2002), dry wetlands (Goossen et al. 1993 *in* Jones and Green 1997), and stubble fields and retired croplands (Kantrud and Kologiski 1983). Madden (1996) found Baird's Sparrow occupied areas with smooth brome and other broad-leaved grasses less commonly than native grasses. Since smooth brome is increasing in mixed grass prairies except on xeric, sandy soils, in North Dakota, Baird's Sparrow habitat is in decline (Madden 1996). Other threats to habitat include invasion of exotic plants such as leafy spurge (*Euphorbia esula*) and western snowberry (*Symphoricarpus occidentalis*) into native prairies and broken ground, leading to monotypic stands that are seldom used by Baird's Sparrow (Jones and Green 1997).

Madden (1996) found that Baird's Sparrow will use exotic grasses that are structurally similar to native mixed grasses, especially Kentucky bluegrass (*Poa pratensis*). Likewise, crested wheatgrass (*Agropyron cristatum*), structurally similar to native grasses, is used by Baird's

Sparrow, and is especially attractive when burned or grazed (Madden 1996). Baird's Sparrow densities are comparable between grazed stands of native grasses and grazed stands of crested wheatgrass in Saskatchewan (Skeel et al. 1995 in Jones and Green 1997, Sutter et al. 1995) and Alberta (Mahon 1995). Johnson and Schwartz (1993) found idle crested wheatgrass in North Dakota was not attractive to Baird's Sparrow. In Saskatchewan parklands, Baird's Sparrow returned to pre-burn densities three years after the burn (Pylpec 1991), but in Alberta, which is drier, densities did not return to pre-burn levels until 5-15 years after the burn (Dale et al. 1999 in Green et al. 2002). Heavy grazing typically makes habitat less attractive to Baird's Sparrow unless the grazing occurs in a mosaic pattern that leaves some areas with dense vegetation (Owens and Myres 1973, Kantrud and Kologiski 1982).

Late Fall/Winter

Baird's Sparrow is most often observed in areas with large grasslands, frequently in association with small flocks of the same species, or mixed with other grassland specialists. In Arizona, this species is found in grasslands dominated by bunchgrasses (*Bouteloua* spp. and *Eragrostris* spp), and few mesquite (*Prosopis* spp.), with mesquite the only woody plant >1 m in height (Gordon 2000a). Baird's Sparrow was more abundant in winter in pastures grazed in the summer rather than in areas idled for 30 years (Gordon 2000a). Less is known about winter habitat use requirements, particularly in Mexico.

Migration

Baird's Sparrow is not often observed during migration, but has been documented in grasslands, weedy fields, hay fields, and near water bodies with bare shorelines (Jones and Green 1997).

Landscape Pattern

Davis and Sealy (1998) found that Baird's Sparrow requires greater than 63 ha of unfragmented grassland for breeding use, while Sutter et al. (2000) found that species abundance reached 50% of maximum occurrence in grassland fragments of 58 ha. Roads influence Baird's Sparrow abundance in native grasslands; the species is less abundant along roads than along pasture trails (Sutter et al. 2000). Grassland fragments smaller than about 60 ha may increase parasitism (Jones and Green 1997). During breeding season in dry years, Baird's Sparrow may be restricted to only a small part of the landscape, dry shallow ponds, depressions, and drainages through cultivated fields (Cartwright et al. 1937 *in* Jones and Green 1997, Faanes 1982 *in* Green et al. 2002).

Movement and Activity Patterns

Migration

Baird's Sparrow is a short- to medium distance migrant within North America, with seasonal movements between the northern Great Plains (U.S. and Canada) (summer range) to wintering areas in the southwestern U.S. (primarily Arizona) and north central Mexico (American Ornithologists Union 1998).

Spring

In early spring birds leave wintering grounds and begin northward movement. The latest sighting in Sonora, Mexico is March 4 (Russell and Monson 1998). In the U.S. portion of the migration corridor, observations have been as follows: Texas - May 21, latest record (Oberholser 1974); Kansas - April 6-May 9 (Thompson and Ely 1992; Nebraska - April 24-May 16 (Sharpe et

al. 2001); South Dakota - April 3, earliest banding record (South Dakota Ornithologists Union 1991); Montana - April 26, earliest arrival, to May 3 (Madden pers. comm. *in* Green et al. 2002); Saskatchewan - average arrival is May 8, earliest recorded was May 2; and Alberta - arrives third week of May (Semenchuk 1992 *in* Green et al. 2002).

Fall

Fall migration begins in September. In Manitoba the latest record is September 23 (Seton 1885 *in* Green et al. 2002). The latest banding record in South Dakota is October 25 (South Dakota Ornithologists Union 1991); Nebraska, September 26 and October 15 banding records (Sharpe et al. 2001); Kansas, specimen records August 25-October 7, observations September 11-October 27 (Thompson and Ely 1992); Texas earliest arrival September 6 (Oberholser 1974); earliest arrival in Sonora, Mexico October 2 (Russell and Monson 1998). Records from Arizona and New Mexico indicate that individuals arrive on wintering grounds in early to mid August (Jones and Green 1997).

Behavior

This species is secretive and difficult to see during migration. Evans (pers. comm. *in* Green et al. 2002) documented night migration, and flight calls by Baird's Sparrow during migration. Migrates as individuals or in small flocks. Thompson and Ely (1992) infer night flight from records in Kansas of birds killed at television towers.

Daily Activity

Local movements include hopping, and walking between clumps of grass and over grass litter. Sometimes runs rapidly, preferring running rather than flying to avoid predators. When not

moving remains hidden on the ground (Thompson and Ely 1992). Sometimes flies directly between singing perches, usually <50 m apart, with an undulating flight pattern on longer flights. Uses fluttery wing-beats during interactions with other individuals of the same species, often twittering at the same time (Green et al. 2002).

Reproduction and Survivorship

Territoriality

Males establish territories upon arrival and immediately begin to defend territories against other males, most often and most intensely early in the nesting season. Chases and face-to-face conflicts settle some boundary disputes (Winter 1994 *in* Green et al. 2002). Males take to flight to defend their territory, directly chase intruders, sometimes approaching the intruder on fluttering wings, or flying directly at the intruder, then returning to the territory on fluttering wings (Cartwright et al. 1937 *in* Jones and Green 1997). Territories are sometimes clustered, but not necessarily related to visual vegetative characteristics (Winter 1994 *in* Green et al. 2002). Males sing on territories, and playbacks elicit walking or running through the grass or short flights towards the tape player. Twittering calls with wing fluttering nearly always accompany interactions with other Baird's Sparrow near territory boundaries (Cartwright et al. 1937 *in* Jones and Green 1997).

In North Dakota, territories in plots burned twice between the late 1970's and 1993 had a mean size of 1.5 ha +_0.33 SE (range = 1.07-2.25, n=11), and in plots burned four times had a mean territory size of 1.2 ha +_0.06 SE (range = 0.8-1.69, n=19) (Winter 1999). Gordon (2000a) during repeated mist netting, found that Baird's Sparrow tended to remain in the vicinity of their first capture, suggesting a winter home range.

Breeding

Baird's Sparrow arrives on the breeding grounds from as early as May 4 (Davis and Sealy 1998) to as late as the second week of June (Cartwright et al. 1937 *in* Jones and Green 1997). Semenchuk (1991 *in* Green et al. 2002) documented arrival on breeding grounds in Alberta on May 10, and there are similar records for Saskatchewan and Manitoba. At Medicine Lake NWR in northeastern Montana, males arrive from April 26 to mid May, usually over a 7-10 day period. Females arrive 3-7 days after males (Cartwright et al. 1937 *in* Jones and Green 1997). Pairs form after territories are established by males (Lane 1968 *in* Green et al. 2002).

This species is primarily monogamous, but females may switch mates between broods (Cartwright 1937 *in* Jones and Green 1997). Breeding takes place from late May to mid-August, the peak period being early June to late July. Dependent juveniles have been observed as early as June 30 and as late as August 18 (Stewart 1975 *in* Dechant et al. 2001, Davis and Sealy 1998). Nest building begins in late May in most areas (Davis and Sealy 1998). The interval between completion of the first nest and initiation of the second nest construction is usually less than 5 days (Davis and Sealy 1998). Dates of observation of eggs: June 13-July 24 in South Dakota (South Dakota Ornithologists Union 1991), June 5-July 21 in North Dakota (Stewart 1975 *in* Dechant et al. 2001), May 21 to July 29 in Saskatchewan (Davis and Sealy 1998), and in Montana, May 23 is the earliest date of egg laying (Green et al. 2002). Second broods have been confirmed in Manitoba on July 20 or 21, 5 to 8 days after fledging the first nest (Davis and Sealy 1998). Cartwright et al. (1937 *in* Jones and Green 1997) concluded that two broods is the norm, and Mahon (1995) concluded that two broods are produced in some years. In Montana, second peak in clutch initiation occurred from June 27 to July 1, and the latest clutch was August 2 (Green et al.

