

Occurrence and Density of Breeding Passerine Birds in Shrubland Habitats in Utah¹

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Introduction

The Utah Avian Conservation Strategy (Parrish et al. 2002) published by the Utah Partners in Flight (UPIF) Program ranked a total of 24 habitat types and 231 bird species with respect to their need for conservation action. The 24 habitat categories were grouped within five major categories, Riparian, Shrublands, Grassland, Forest, and a collection of additional categories unique to conservation planning efforts in Utah. Shrublands comprise the most abundant of these habitat categories, with sagebrush communities (2.9 million ha) second only to greasewood/halogeton dominant shrublands (5.5 million ha) in total abundance statewide.

Various terminologies have been suggested for referring to western shrublands. The term 'shrubsteppe' technically refers to shrublands that include a substantial portion of native grass (e.g., 'steppe'). However, the term shrubsteppe or 'sagebrush steppe' has more recently been used to refer to sagebrush (*Artemisia* sp.) shrublands only (Paige and Ritter 1999).

In addition, some bird species have been referred to as 'obligates' in sagebrush habitats, including Sage Grouse (*Centrocercus urophasianus*), Sage Thrasher (*Oreoscoptes montanus*), Sage Sparrow (*Amphispiza belli*), and Brewer's Sparrow (*Spizella breweri*) (Braun et al. 1976). Terms such as 'shrub obligates', or 'sage obligates', or 'shrubsteppe obligates' have been applied to these species with the assumption that they are "almost entirely dependent" on sagebrush for their existence (Braun et al. 1976, Knick and Rotenberry 1995, Saab and Rich 1997). On the other hand, Braun et al. (1976) suggested that birds are more adapted to the structure of a shrub community rather than to the particular species of shrub that is present.

Study Area and Methods

We surveyed birds in two shrubland communities in Utah between 1998 and 2002 using sampling protocols modified to allow the collection of distance data (see Ralph et al. 1993, Buckland et al. 2001). Each community was surveyed at least 3 times (i.e., visits) from May through June each year.

Between 1998 and 2002, we surveyed birds in predominantly greasewood/halogeton shrublands in northwestern Utah using point transects (Buckland et al. 2001). The survey area lies within the Utah Test and Training Range (UTTR), an ungrazed area of approximately 405,000 ha used for military training purposes. The UTTR survey area also contains mixed shrub and grassland habitats with the grasslands being comprised of both native and introduced species.

A total of 100 points were spaced approximately 250-300 m apart on either side of existing access roads within the UTTR. Distance from roads to the points varied from a minimum of 50 m to as high as 372 m. Each observer surveyed 10 points for an 8-minute time interval during each visit, and all detections (and their respective distances) were recorded.

Between 2001 and 2002, we concurrently surveyed birds in sagebrush shrublands on lands managed by the U.S. Bureau of Land Management (BLM) in southwestern Utah using line transects (Burnham et al. 1980, Buckland et al. 2001). The southwestern Utah survey area is comprised of 3 large, open blocks of sagebrush (2 blocks approximately 800 ha in size and a third of approximately 500 ha), with limited amounts of additional vegetation types present due to big game and livestock grazing. A total of 16 line transects, each approximately 450 m in length and spaced approximately 250 - 300 m apart, were randomly established in each of the three blocks (e.g., 16 line transects per block).

Distances (measured with laser range finders) to all birds seen or heard were recorded in both survey areas along with species identification, flock size, age/gender, and method of detection (visual, auditory, or both) at each location sampled. Due to the difference in number of years sampled between the two survey areas, we calculated a simple average number of detections recorded for each survey area. Program Distance (Thomas et al. 1998) was used to calculate densities for

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Table 1—Total number of avian detections recorded along point transects in northwestern Utah and line transects in southwestern Utah.

Greasewood/Halogeton shrublands in NW Utah		Sagebrush shrublands in SW Utah	
Species	Number detected	Species	Number detected
Horned Lark	3,325	Sage Sparrow	473
Western Meadowlark	1,301	Brewer's Sparrow	413
Black-throated Sparrow	418	Lark Sparrow	153
Brewer's Sparrow	341	Pinyon Jay	143
Sage Sparrow	230	Black-throated Sparrow	126
Sage Thrasher	186	Western Meadowlark	42
Loggerhead Shrike	90	Horned Lark	30
Mourning Dove	41	Mourning Dove	29
European Starling	25	Sage Thrasher	13
Rock Wren	22	Chipping Sparrow	11
Lark Sparrow	16	Western Kingbird	7
Burrowing Owl	13	Spotted Towhee	7
Northern Mockingbird	12	Common Nighthawk	7
Blue-gray Gnatcatcher	11	Loggerhead Shrike	6
Say's Phoebe	9	Unidentified Sparrow	4
Common Raven	5	Vesper Sparrow	4
Mountain Bluebird	4	American Kestrel	3
House Finch	4	Red-tailed Hawk	3
Northern Harrier	3	Black-billed Magpie	3
Prairie Falcon	3	Common Raven	2
Common Poorwill	2	Red-winged Blackbird	2
Barn Swallow	2	Northern Harrier	1
Townsend's Solitaire	2	Green-tailed Towhee	1
Western Scrub Jay	2	Canyon Wren	1
Bullock's Oriole	2	Cooper's Hawk	1
White-crowned Sparrow	1	Bullock's Oriole	1
Brown-headed Cowbird	1	Lewis's Woodpecker	1
Brewer's Blackbird	1		
Warbling Vireo	1		
Unidentified Sparrow	1		
Unidentified Flycatcher	1		
MacGillivray's Warbler	1		
Cordilleran Flycatcher	1		
Short-eared Owl	1		
Green-tailed Towhee	1		
Ruby-crowned Kinglet	1		
Chipping Sparrow	1		

two species, Brewer's Sparrow and Sage Sparrow, which have been identified as priority species for conservation action in Utah (see Parrish et al. 2002).

Results and Discussion

Within the UTTR survey area in northwestern Utah, a total of 6,081 detections were recorded representing 37 species (table 1). Of these, approximately 84 percent were neotropical migrants. Horned Lark (*Eremophila alpestris*), Western Meadowlark (*Sturnella neglecta*),

Black-throated Sparrow (*Amphispiza bilineata*), Brewer's Sparrow, Sage Sparrow, Sage Thrasher, Loggerhead Shrike (*Lanius ludovicianus*), Mourning Dove (*Zenaida macroura*), European Starling (*Sturnus vulgaris*), Rock Wren (*Salpinctes obsoletus*), and Lark Sparrow (*Chondestes grammacus*) comprised approximately 97 percent of the detections, with an average of 1,216 (± 111 se) total detections/yr for the northwestern Utah survey area. Horned Lark and Western Meadowlark detections occurred mostly within the grassland portions of the survey area, while Black-throated Sparrow, Brewer's Sparrow, and Sage Sparrow occur-

red primarily in greasewood/halogeton habitat. Loggerhead Shrike and Lark Sparrow were mostly detected in areas with sparse mixed shrub cover.

A total of 1,487 detections were recorded in the sagebrush survey area in southwestern Utah representing 27 species (table 1). Of these, approximately 86 percent were neotropical migrants. Sage Sparrow, Brewer's Sparrow, Lark Sparrow, Pinyon Jay (*Gymnorhinus cyanocephalus*), Black-throated Sparrow, Western Meadowlark, Horned Lark, Mourning Dove, Sage Thrasher, and Chipping Sparrow (*Spizella passerina*) comprised approximately 97 percent of the detections in the sagebrush survey area. Detections in the southwestern Utah survey area averaged 743 total detections/yr (± 97 se) for each year sampled.

We found that Brewer's Sparrow densities were 55.2 birds/40 ha in sagebrush and 41.6 birds/40 ha in greasewood/halogeton. Sage Sparrow densities in sagebrush were 61.0 birds/40 ha in greasewood/halogeton were 20.7 birds/40 ha. Given these densities, we concluded that both species use greasewood/halogeton habitat in substantial densities as well as sagebrush during the breeding season. Accordingly, considering either species as a 'sagebrush obligate,' particularly Brewer's Sparrow, based on our results appears to be unjustified.

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