POPULATION DENSITIES AND COMMUNITY STRUCTURE OF BIRDS IN JACKSON HOLE: A REASSESSMENT AFTER 25 YEARS

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SUMMARY

The award covers research expenses for a comparison of bird community structure--species, diversities, densities and distribution, and interspecific interactions--in two habitat types in Jackson Hole/Grand Teton National Park, 1966-68 data versus 1991-92 data. In 1991 two study sites were re-established in the park, in sites as nearly overlapping as possible sites worked previously in 1966-68. The sites are

- a) willow scrub habitat, ca. 100 m west of Moran Junction;
- b) grass-sagebrush/forb meadow, ca. 200 m SE of Moran Junction.

Each site was re-established with a 15 m x 15 m grid. In the grass-sagebrush site, overlap (1991 site) with the 1966 study area (Cody, 1974, 1985) is estimated to be 95%; in the willow scrub site, overlap with the previous site is estimated to be 70%. A partial relocation of this site was necessitated by extensive flooding of the old site, a product of high water levels within the willows area, a late season, and the influence on these factors by a great deal of beaver activity.

Within each site, breeding bird censuses were made during two time periods, June 15-27 and July 30-Aug 9. Territorial activity was mapped, and vegetation measures made within each 15 m x 15 m

quadrat. Foraging behavior and activity was measured for each bird species present. Density estimates, territory size, intraspecific interactions with vegetation structure and interspecific interactions over habitat were measured in each of these two sites. Insect densities were estimated in the willows site using Tanglefoot boards.

In the grass-sage plot (Table 1), the chief differences, 1966-1991, can be summarized as follows:

- a) an overall reduction in habitat occupancy by emberizids, by a factor of about 2;
- b) a reduced number of Brewer's sparrows, with the addition of a second species of Spizella, chipping sparrow;
- c) the addition of starlings, which were not present at the site in 1966.

At the willow study site, bird densities were very similar in the foliage-feeding insectivores, the warblers and flycatchers (Table 2). Densities were comparable also in the three emberizids that favor the wetter sites, Lincoln's, fox and song sparrows. However, the two species of emberizids that are typical of drier sites, white-crowned sparrow and clay-colored sparrow, were reduced in density, and absent, respectively.

Year of Census	1966	1991	
Site area	4.97 ha	4.97 ha	
Brewer's sparrow Spizella breweri			
Quads occupied	108	58	
Breeding pairs	6	5	
Chipping sparrow Spizella passerina			
Quads occupied	0	12	
Breeding pairs		1	
White-crowned sparrow Zonotrichia leucoph	rvs		
Quads occupied	45	18	
Breeding pairs	2	2	
Versee mensee Personates ensuring			
vesper sparrow Pooecetes grammineus	120	EE	
Quads occupied	129	55	
Breeding pairs	4	5	
Savannah sparrow Passerculus sandwichensi.	5		
Quads occupied	67	40	
Breeding pairs	4	5	
Species also present:			
Cliff swallow Petrochelidon pyrrhonota			
1,	++	+ +	
Brewer's blackbird Fundagus cvanocenhalus			
	++	++	
Brown-headed cowbird Molothrus ater			
	+	+	
Starling Sturnus vulgaris			
C		+	

Further, the ground-foraging thrush was absent in 1991, as was the hummingbird. These results seem to indicate that, with overall wetter conditions and a later season, the bird community has shifted correspondingly to disfavor those species that customarily forage on drier ground (thrush, two emberizids), or on late-blooming flowers (the hummingbird). However, the clay-colored sparrow could not be located anywhere in the park, whereas it was reasonable common in several locations in 1966 (e.g. up the Gros Ventre). Whether there has been a population status change in this species, which is here on the extreme westen edge of its range, remains to be seen following next season's work.

1992 SEASON

The work will continue in June-July 1992, and no problems are anticipated in its completion. The 1992 season will amplify data on vegetation structure, collect the season's bird census data, and allow a detailed comparison of the status of the bird populations in these two habitats across a 25 year time span.

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Year of Census	1966	1991	
Site area	2.21	2.20	
Yellow warbler Dendroica petechia			
Quads occupied	61	62	
#Breeding pairs	8	8	
Wislon's warbler Wilsonia pusilla			
Quads occupied	48	52	
#Breeding pairs	6	6	
Northern yellowthroat Geothlypis trichas	05		
Quads occupied	85	50	
#Breeding pairs	11	1	
Trail's flycatcher Empidonax traillii			
Quads occupied	34	37	
#Breeding pairs	2	2	
Lincoln's manager Malagning lincolnii			
Curda accuried	80	26	
#Breeding pairs	6	30 6	
Fox sparrow Passerella iliaca		a ang a consis	
Quads occupied	58	41	
#Breeding pairs	5	5	
Song sparrow Melospiza melodia			
Ouads occupied	27	27	
#Breeding pairs	3	5	
White-crowned sparrow Zonotrichia leucophr	ys		
Quads occupied	71	31	
#Breeding pairs	0	3	
Clay-colored sparrow Spizella pallida			
Quads occupied	28	0	
#Breeding pairs	3	ingen - alt	and the of the second second
Service and the set of the second second			
Owada occupied	15		
Quans occupien	15		Sandar La Contra
Calliope hummingbird Stellula calliope			
Quads occupied	33	tation of the second	
#Breeding pairs	3		A PARAMAN A PARAMA

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Table 2. (continued)			
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Black-billed magpie Pica pica			
* 400 1	++ 2	++	
* #Breeding pairs	Z	2	
Cliff quallow Patrochalidon murhonota			
Cini swanow Petrochendon pyrnonola	+ +	T T	
	тт	TT	

♦ OVERALL SUMMARY

Data collected in 1991 show that the vegetation structure in the grass-age plot is essentially unchanged in 25 years, and that the willows site is structurally similar though parts of it are now flooded which were drier in 1966. A part of this difference is attributable to 1991-specific conditions, such as high precipitation and a late season; other aspects are due to beaver activity, which is presumably of a cyclic or opportunistic nature in such habitat. Bird species and densities are generally very similar, with some evidence showing a tracking of the altered conditions in the willows by the bird community, respondidng to wetter ground foraging conditions there. The single most apparent anomaly is the absense from the study sites, and from the park as determined from a cursory survey, of clay-colored sparrows, a difference that might reflect a range contraction in the species from these its westernmost outlying breeding sites in the central Rockies.

LITERATURE CITED

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