

Perch Use by 7 Grassland Bird Species in Northern Illinois

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ABSTRACT

The use of perches in grasslands was determined for 7 species of grassland birds by walking transects and observing objects used as perches. Birds used 24 plant species or groups, 8 man-made objects, and the ground. Grasshopper sparrows (*Ammodramus savannarum*), and Henslow's sparrows (*A. henslowii*) used forbs exclusively. Dickcissels (*Spiza americana*), savannah sparrows (*Passerculus sandwichensis*), bobolinks (*Dolichonyx oryzivorus*), and red-winged blackbirds (*Agelaius phoeniceus*) used shrubs most often. Generally, singing heights were < 1 m for grasshopper sparrows and Henslow's sparrows, 1-1.5 m for bobolinks, savannah sparrows, and dickcissels, 1.5-2 m for red-winged blackbirds, and >2 m for eastern meadowlarks (*Sturnella magna*). Grassland songbirds seem to choose perches mainly for their height above the vegetation, rather than for a specific plant species or object, although birds usually chose a lower location on the perch from which to sing.

INTRODUCTION

Over 8.1 million ha of tallgrass prairie once covered 60% of Illinois. Since 1970, <1% of that remains in scattered parcels throughout the state (Anderson 1970). The meadows and hayfields that replaced the native prairie declined substantially in area due to intensified row crop farming, mainly corn and soybeans, since the late 1950's.

Opportunities to observe birds in native grasslands are scarce (Johnsgard and Rickard 1957), especially in Illinois where the associations of native tallgrass prairie used by grassland birds were not studied before the prairies were plowed (Birkenholz 1973). As a result, the descriptions of habitats used by grassland birds in Illinois (e.g., Graber and Graber 1963) and elsewhere have been limited mostly to pastures and hayfields, as these usually are the only remaining extensive grassland habitats. Within these remaining grasslands, perches might influence breeding success of grassland birds by being essential for singing by territorial males and observation for capturing insect prey for nestlings.

The objective of this study was to determine perch use by 7 species of grassland birds in northern Illinois.

STUDY AREA

The study was conducted in 21 fields of the Forest Preserve District of DuPage County, IL. Located in northeastern Illinois about 32 km west of Chicago, and within the Northeastern Morainal Division (Mapes 1979, Neely and Heister 1987), DuPage County is a heavily urbanized county of 847 km². Presettlement vegetation in the county was 75% tallgrass prairie and wetland and 25% small savannas and groves timbered by widely scattered oaks (*Quercus* spp.) and hickories (*Carya* spp.) (Lampa 1985).

Currently, the District has about 8094 ha of open space within its system. Non-native grasslands comprise 3035 ha (42%) created by seeding former croplands to perennial grasses. The District acquired >2833 ha of agricultural lands since the mid-1960's. These lands were planted mainly to meadow fescue (*Festuca elatior*) and white clover (*Trifolium repens*) before 1979. From 1980 until the present, former agricultural lands were planted with a seed mixture of timothy (*Phleum pratense*), perennial rye (*Lolium perenne*), and white clover. Fields were mainly of fescue, mixed grasses, or grass/forb (high composition of forbs).

METHODS

Three times during 21 May-10 June 1987, we recorded bird species, sex, and plant species or object used as perches by individual birds <60 m on each side of a transect located in the middle of 8 fescue fields (8.9-87.1 ha), 5 mixed grass fields (8.9-40.5 ha), and 8 grass/forb fields (8.9-97.1 ha) (Emlen 1971, 1977, Mikol 1980). During bird-centered vegetation sampling (Larson and Bock 1986, Kobal 1990) conducted 0530-1200 hours, 15 June-10 July 1987, we also recorded bird species, sex, plant species or object used as perch, height of perch, and height above ground of singing male on the perch.

RESULTS

Early in the breeding season (May), most bird species used dried forb stalks and shrubs as perches. Birds used new forb growth as it became available later in the breeding season (June-July). Five bird species in 3 habitat types used 24 plant species or groups, 8 man-made objects, and the ground (Table 1).

Shrubs were used 21% of the time, and the ground 13% of the time by 7 bird species in the 3 habitat types. We observed all bird species using the ground except grasshopper sparrows. Eastern meadowlarks used ground perches more (39%) than other bird species ($P < 0.05$, t-test) (Table 1). The red-winged blackbird, bobolink, savannah sparrow, and dickcissel used shrubs most often. Grasshopper sparrows and Henslow's sparrows used forbs exclusively.

Bobolinks used new growth of goldenrod clumps as they became available. Of the birds observed on the ground earlier in the year, 60% were females. Females became more secretive as brood rearing began. Males singing from elevated perches were the only individuals sampled.

Perch heights for 139 individual birds ranged from 219 cm for eastern meadowlarks to 108 cm for grasshopper sparrows. Singing heights ranged from 203 cm for eastern meadowlarks to 90 cm for Henslow's sparrows (Table 2). Generally, singing heights were <1 m for grasshopper sparrows and Henslow's sparrows; 1-1.5 m for bobolinks, savannah sparrows, and dickcissels; 1.5-2 m for red-winged blackbirds; and >2 m for eastern meadowlarks.

DISCUSSION

Grassland songbirds seemed to choose perches mainly for their height above the vegetation, rather than for a specific plant species or object. Any natural or human-made object that projected above the vegetation was suitable. Harrison (1977) concluded that grassland-associated birds use any elevated perch structure < 2 m tall. We found that selection of perches varied by bird species. So did the height at which they sang relative to the height of the perch, i.e., birds usually did not sing from the top of the perch.

Eastern meadowlarks and savannah sparrows sang from the ground and bobolinks often sang in flight, but presence of perches seems essential to grassland birds as singing and observation posts. Perch sites might be important as singing posts for open country passerines without aerial flight songs (Cody 1985). Robins (1971) noted that the presence of perches affected habitat quality for Henslow's sparrows. Schroeder and Sousa (1982) stated that ideal habitat for eastern meadowlarks contains 4 perches/1.2 ha.

Harrison (1977) found that eastern meadowlarks exemplified the generalization that taller perches will be used instead of shorter ones. Grasshopper sparrows normally will select the highest perch available (Smith 1963, 1968; Weins 1973), although Harrison (1977) found that they used lower perches 88% of the time. Henslow's sparrows usually sing just below the general vegetative cover (Robins 1971). Weins (1969) in Wisconsin noted that some bird species use only specific perches, and that aggressive encounters occurred around song-perches. Nonetheless, Knodel-Muntz (1981) and Vickery and Hunter (1995) found that song-perches alone do not limit grassland birds that sang exclusively from them or also sang in flight. Our study suggests that grassland birds are not selective about what they use for perches. But the presence of available perches and their height above the vegetation appears important for singing and observation posts when combined with other habitat factors, e.g., grassland type and size.

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Table 1. Frequency (%) of use of plant species or sites as perches by grassland birds in fields of fescue (F), mixed grasses (MG), and grass/forb (GF) during transect counts in northern Illinois, May-June 1987.^a

Perch species or site	Bobolink			Eastern meadowlark			Savannah sparrow			Grasshopper sparrow		Red-winged blackbird		
	F (70)	MG (32)	GF (129)	F (81)	MG (60)	GF (39)	F (208)	MG (29)	GF (27)	F (9)	GF (9)	F (52)	MG (38)	GF (357)
Ground	25.7	3.1	7.7	39.5	33.3	43.5	9.6	3.4	7.4	0.0	0.0	15.4	18.4	3.3
Shrubs	12.8	31.2	23.2	20.9	30.0	20.5	18.7	51.7	18.5	0.0	0.0	30.7	31.5	18.5
Sow thistle	10.0	0.0	0.8	0.0	0.0	0.0	13.9	0.0	0.0	0.0	0.0	5.8	0.0	0.0
Thistle	4.3	0.0	6.9	0.0	1.6	0.0	9.1	0.0	0.0	55.5	0.0	1.9	2.6	20.4
Dogbane	0.0	0.0	5.4	0.0	0.0	5.1	3.8	0.0	3.7	0.0	0.0	3.8	0.0	11.7
Meadow fescue	8.5	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	2.6	0.0
Yellow sweet-clover	8.5	0.0	3.1	2.5	0.0	0.0	6.7	0.0	0.0	22.2	0.0	1.9	0.0	0.3
Reed canary grass	7.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Common mullein	5.7	0.0	0.0	0.0	0.0	5.1	1.0	0.0	0.0	0.0	0.0	1.9	0.0	1.4
Wild lettuce	4.3	0.0	6.9	2.5	0.0	5.1	0.0	0.0	14.8	0.0	0.0	1.9	0.0	0.3
Asters	2.8	0.0	6.2	0.0	0.0	0.0	4.3	10.3	7.4	0.0	22.2	0.0	0.0	0.0
Queen-Anne's-lace	2.8	15.6	3.1	0.0	0.0	0.0	6.7	3.4	0.0	0.0	0.0	1.9	2.6	3.3
Common milkweed	2.8	0.0	0.8	3.7	1.6	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	3.1
Unknown forbs	2.8	0.0	3.1	2.5	3.3	7.8	3.3	10.3	3.7	11.1	33.3	1.9	0.0	8.1
Sunflowers	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	2.6	0.0
Evening primrose	0.0	0.0	11.6	0.0	1.6	2.5	1.9	0.0	44.4	0.0	44.4	3.8	5.2	8.4
Smooth brome	0.0	6.2	13.1	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Orchard grass	0.0	0.0	1.5	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trees	0.0	12.5	2.3	24.7	11.6	7.8	1.0	3.4	0.0	0.0	0.0	23.1	23.6	13.4
Bindweed	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Curled dock	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.0
Broad-leaved cattail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0
Common ragweed	0.0	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.1
Goldenrod	0.0	9.3	1.5	0.0	1.6	0.0	0.0	6.9	0.0	0.0	0.0	0.0	5.2	0.8
Timothy	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Fenceline	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Fenceposts	0.0	0.0	0.0	3.7	0.0	2.5	1.4	0.0	0.0	0.0	0.0	1.9	0.0	0.8
Signs	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trail markers	0.0	0.0	0.0	0.0	8.3	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0
Powerline tower	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0
Cement posts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0
Wooden stakes	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Telephone wires	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5

^a Total number of birds observed during 3 counts along transects in each habitat type by species is given in parentheses. We observed no grasshopper sparrows in mixed grass fields. Sample sizes for Henslow's sparrows (N=6) and dickcissels (N=5) were too small to include. Dickcissels (5) occurred only in grass/forb fields, with a frequency of 60% on shrubs and 40% on evening primrose. Henslow's sparrows (6) occurred only in grass/forb fields, with a frequency of 16.7% each on ground, brome, goldenrod, yellow sweet clover, asters, and unknown forb.

Table 2. Song perch use (percentage), perching height, and singing height^a for 7 grassland bird species^b in northern Illinois, June-July 1987.

Henslow's sparrow (N=9)		Dickcissel (N=11)		Bobolink N=14)		Grasshopper sparrow (N=16)	
Queen-Anne's-Lace	33.3	Shrubs	18.2	Goldenrods	42.8	Bull thistle	18.8
White sweet clover	22.2	Evening primrose	18.2	Multiflora rose	21.4	Evening primrose	12.5
Yellow sweet clover	11.1	Wild lettuces	9.1	Common milkweed	14.3	Sow thistle	12.5
Dogbane	11.1	Asters	9.1	Shrubs	7.1	Shrubs	12.5
Multiflora rose	11.1	Queen-Anne's-Lace	9.1	Wild lettuces	7.1	Common milkweed	12.5
Orchard grass	11.1	Bull thistle	9.1	Wooden stake	7.1	Fallen tree top	6.2
		Goldenrods	9.1			Goldenrods	6.2
Perch height	132.6 (24.3)	Sow thistle	9.1	Perch height	126.7 (43.8)	Wild lettuces	6.2
Singing height	89.6 (12.5)	Unknown forbs	9.1	Singing height	115.3 (31.1)	Fescue	6.2
		Perch height	152.9 (29.1)			Perch height	108.4 (23.4)
		Singing height	145.4 (34.1)			Singing height	97.3 (21.1)
Savannah sparrow (N=24)		Eastern meadowlark (N=28)		Red-winged blackbird (N=34)			
Multiflora rose	20.8	Shrubs	32.1	Shrubs	17.6		
Canada thistle	16.7	Multiflora rose	14.3	Dogbane	11.8		
Shrubs	12.5	Trees	14.3	Trees	11.8		
Goldenrods	12.5	Common milkweed	14.3	Burdock	11.8		
Trees	8.3	Trail markers	7.1	Goldenrods	8.8		
Evening primrose	8.3	Dogbane	3.6	Multiflora rose	5.9		
Common mullein	4.2	Canada thistle	3.6	Sunflowers	5.9		
Posts	4.2	Bull thistle	3.6	Evening primrose	5.9		
Wild lettuces	4.2	Telephone wire	3.6	Asters	5.9		
Sow thistle	4.2	Unknown forbs	3.6	Common milkweed	5.9		
Unknown forbs	4.2			Giant ragweed	2.9		
		Perch height	219.1 (204.8)	Bull thistle	2.9		
Perch height	141.9 (86.4)	Singing height	202.5 (198.2)	Unknown forbs	2.9		
Singing height	116.9 (41.3)						
				Perch height	191.1 (96.1)		
				Singing height	176.5 (37.2)		

^aMean (SD) for perch height and singing height (cm). Birds usually did not choose the top of the perch for singing.

^bNumber (N) of individual birds observed is in parentheses.

Appendix I. Scientific names of plant species used as perches by grassland birds in northern Illinois, May-June 1987.

Common name	Scientific name	Common name	Scientific name
Grasses			
Meadow fescue	<i>Festuca elatior</i>	Broad-leaved cattail	<i>Typha latifolia</i>
Orchard grass	<i>Dactylis glomerata</i>	Queen-Anne's-lace	<i>Daucus carota</i>
Smooth brome	<i>Bromus inermis</i>	Common mullein	<i>Verbascum thapsus</i>
Reed canary grass	<i>Phalaris arundinacea</i>	Common milkweed	<i>Asclepia syrica</i>
Timothy	<i>Phleum pratense</i>	Aster	<i>Aster</i> spp.
		Thistle	<i>Cirsium</i> spp.
		Sunflower	<i>Helianthus</i> spp.
Forbs			
Yellow sweet-clover	<i>Melilotus officinalis</i>		
Common ragweed	<i>Ambrosia artemisiifolia</i>		
Field bindweed	<i>Convolvulus arvensis</i>		
Hedge birdweed	<i>C. sepium</i>		
Common sow thistle	<i>Sonchus oleroceus</i>		
Dogbane	<i>Apocynum medium</i>		
Curled dock	<i>Rumex crispus</i>		
Wild lettuce	<i>Lactuca canadensis</i>		
Evening primrose	<i>Oenothera biennis</i>		
Goldenrods	<i>Solidago</i> spp.		
