

Low Incidence of Cowbird Parasitism of Grassland Birds on Illinois Airports

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ABSTRACT

Grassland birds have shown more consistent population declines than any other ecological group of birds in North America. Population declines have in part been attributed to high nest parasitism by brown-headed cowbirds (*Molothrus ater*). Parasitism rates for grassland birds appear to be variable depending on the surrounding landscape. This study investigated the frequency of parasitism by brown-headed cowbirds of grassland bird nests on seven small, rural airports in east-central Illinois. We expected to find high parasitism rates on these small airports which are typically bordered by fragmented woodlots and agricultural fields, which provide abundant perch sites and food resources for cowbirds. Of the 118 nests found, representing 6 species, only 2 (1.7%) of the nests were parasitized and neither of the 2 nests fledged cowbird young. This is a low rate compared to other studies on grassland birds. This study indicates that cowbird parasitism may not affect grassland bird reproduction on small, rural airports in Illinois.

Key Words: cowbird parasitism, grassland birds, rural airports

INTRODUCTION

The brown-headed cowbird (*Molothrus ater*) is an obligate brood parasite that has recently increased in abundance due to extensive anthropogenic fragmentation and modification of the landscape which has led to the exploitation of more host species (Brittingham and Temple 1983, Johnson and Temple 1990). Population growth of cowbirds has caused dramatic increases in parasitism rates (Brittingham and Temple 1983). Most of these increases involved new host species, characteristically found in forest-agriculture ecotones (Gates and Gysel 1978). Surprisingly, there is little information available on rates of

grassland bird parasitism (Elliott 1978) and the impact cowbirds have on grassland bird productivity.

Reported parasitism rates on grassland birds vary between species ranging from 81.8% for lark sparrows (*Chondestes grammacus*) to 6.9% for western meadowlarks (*Sturnella neglecta*) with intermediate levels (45.2%) for horned larks (*Eremophila alpestris*) (Hill 1976). Parasitism of grasshopper sparrows (*Ammodramus savannarum*) is rare (Elliott 1978), and both eastern and western meadowlarks are categorized as infrequent hosts (Friedmann, 1963). Zimmerman (1983) found that 84.8% of 235 prairie nests [primarily dickcissels (*Spiza americana*)] were parasitized. Camp and Best (1994) documented 50% parasitism for species nesting along roadsides. There is, however, a trend for higher parasitism rates on grassland birds that nest near wooded edges (Gates and Gysel 1978, Johnson and Temple 1990).

Small, rural airports are typically characterized as open grassland suitable for nesting by grassland birds (Crossman 1989, Kershner and Bollinger 1996, Vickery et al. 1994), and in Illinois are generally bordered by both fragmented woodlots and agricultural fields (pers. obs). Adjacent woodlots provide abundant perch sites, and agricultural fields provide food resources for cowbirds (Brittingham and Temple 1983, Gates and Gysel 1978). The objectives of this study were twofold; 1) to test our hypothesis that high rates of cowbird parasitism occur on grassland birds nesting on small, rural airports, and 2) to measure the impact of parasitism on grassland bird productivity. We predicted that grassland birds nesting on these airport grasslands would have high parasitism rates because all airports used in this study were less than 100 ha of grassland habitat and linear in shape, essentially creating edge habitat, and were completely bordered by a combination of woodlots and agriculture fields as close as 5 m from the airport edge.

METHODS

The study was conducted at 7 airports in 7 counties in east-central Illinois: Clark, Coles, Crawford, Douglas, Edgar, Macon, Richland counties (Kershner and Bollinger 1996). We searched for nests of grassland birds twice a week at each airport (see Kershner and Bollinger 1996 for detailed methods). When found, a nest was marked and visited every three days to monitor outcome. Nests with cowbird eggs or young were especially noted to determine the effect of parasitism on host reproduction.

RESULTS

Only 2 of 118 nests found on airport grounds (1.7%) were parasitized (Table 1). A parasitized red-winged blackbird (*Agelaius phoeniceus*) nest was abandoned, while a horned lark nest failed to fledge the single cowbird young.

The red-winged blackbird nest was found with 3 host eggs and 1 cowbird egg. Of the 4 eggs in the nest only the cowbird egg hatched. On the next visit to the nest, the 2-3 day old cowbird was found dead in the nest and 1 of the 3 host eggs was broken; the remaining 2 host eggs were undisturbed. Neither adult was present, and the remaining eggs never hatched. This nest was classified as abandoned, cause unknown.

The horned lark nest was found with an adult incubating 2 host eggs, and 1 cowbird egg. Three days later the nest still contained the 2 host eggs, but the cowbird egg could not be located. The nest was monitored until both eggs hatched and both young fledged.

DISCUSSION

The most reasonable explanation for the missing cowbird egg is that the adults may have ejected the egg from the nest, although Hill (1976) provides evidence that horned larks are tolerant of cowbird parasitism. We believe this is the first report of horned larks rejecting cowbird eggs. Our data indicate that for small, rural airports in Illinois surrounded by woodlots and agricultural fields, cowbird parasitism rates are relatively low compared to other grassland systems. Parasitism appears to have little impact on grassland bird productivity on airports in East-central Illinois.

The low parasitism rates for the Illinois sites may be a consequence of the significantly greater proportion of fragmented forest tracts compared to other Great Plains states (i.e., Kansas $z=2$, $P= 0.02$; Nebraska $z=2.35$, $P= 0.009$), which have fewer scattered woodlots adjacent to grasslands (Illinois Dept. Nat. Resour. 1996, U.S. Forest Service 1996). These scattered woodlots may be more attractive to cowbirds than grassland areas because cowbirds may be more successful finding host nests and fledging young in forest tracts compared to finding well-concealed, ground-nesting grassland bird nests. If this is true, cowbirds should parasitize woodland species more than grassland species in Illinois. Cowbirds would parasitize grassland birds more in the Great Plains because of the relatively small amount of forested areas, making grassland birds more readily available than woodland birds.

When given the opportunity, cowbirds should parasitize woodland species more than grassland species because woodland birds are evolutionary disadvantaged compared to grassland birds. Grassland host species have had long ancestral experiences with cowbird parasitism and are much less receptive to parasitism than new host species of the forests which have little experience with cowbird parasitism (Hill 1976, Mayfield 1965). Besides being less receptive to parasitism, ground nests are usually well-concealed and hard to find compared to most forest bird nests. Even in woodlots, Robinson (1992) found a tendency for cowbirds to select above-ground nests over ground nests. Furthermore, fledging success for cowbirds in grassland bird nests may often be low [i.e., 5.8% fledging success with eastern meadowlarks (*Sturnella magna*) and 7.1% fledging success with grasshopper sparrows; Elliot 1978] especially when compared to the fledging success of cowbirds in forest nesting species. Grassland species may be more likely to expel cowbird eggs or abandon nests with cowbird eggs, thus reducing cowbird fledging success, than some forest species (Hill 1976, Zimmerman 1983). The combination of multiple, available forest hosts and the evolutionary advantage of grassland species may be the driving mechanism for reduced parasitism rates on small, rural airport grasslands in Illinois.

ACKNOWLEDGMENTS

We would like to thank the Eastern Illinois University Council for Faculty Research and the Illinois Academy of Sciences for funding this research. Nancy Keyth provided valuable field assistance.

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Table 1: Species found nesting on airport grasslands in east-central Illinois with the number of nests found and the number parasitized by brown-headed cowbirds.

Species	nests found	nests parasitized
Eastern meadowlark (<i>Sturnella magna</i>)	76	0
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	12	0
Savannah sparrow (<i>Passerculus sandwichensis</i>)	12	0
Red-winged blackbird (<i>Agelaius phoeniceus</i>)	11	1
Song sparrow (<i>Melospiza melodia</i>)	4	0
Horned lark (<i>Eremophila alpestris</i>)	3	1
Total	118	2

