



Avian Response to Grassland Management on Military Airfields

Project # 10-381

Background:

The primary management objective on airfield grasslands is to reduce the risk of bird/wildlife aircraft strikes, which can be both costly and catastrophic. At the same time, it is often both necessary and desirable to avoid negative impacts on endangered and threatened species. Little information is available in the scientific literature to guide these management decisions. Management practices on most military airfields are based largely on the assumption that vegetation between 7 to 14 inches high is least attractive to hazardous birds, and airfields are maintained at this height through regular mowing. Despite its wide adoption, this assumption has yet to be rigorously tested, and it is therefore not possible to say if maintaining airfields at shorter or taller heights might be more beneficial to air safety.



Canada Geese loafing on a runway at Westover Air Reserve Base, Massachusetts. Inset: Grasshopper Sparrow breeding at Joint Base McGuire-Dix-Lakehurst, New Jersey (photo: Kevin Karlson).

Damaging bird strikes typically involve common large-bodied or flocking species, such as Turkey Vulture (*Cathartes aura*), Canada Goose (*Branta canadensis*), and European Starling (*Sturnus vulgaris*), which may respond differently to management activities than grassland birds of conservation concern. North American grassland birds, including Grasshopper Sparrow (*Ammodramus savannarum*), Eastern Meadowlark (*Sturnella magna*), and Upland Sandpiper (*Bartramia longicauda*), typically do not pose a significant threat to aircraft, and have experienced significant population declines in recent decades due to

loss of habitat. Large grasslands associated with airports have become increasingly important for the conservation of these species as alternative habitats (such as agricultural grasslands) have been lost or degraded. Knowledge of how different species respond to different management regimes in airfield grasslands will have benefits for both air safety and conservation.

Objective:

This Legacy-funded study examined the effects of vegetation structure and management regimes on the abundance and distribution of birds on military airfields during spring and fall migration and the summer breeding season. We focused on how airfield mowing practices affect habitat use by both high-risk species and species of conservation concern. We also sought to determine the prevalence and patterns of bird activity near runways.

Summary of Approach:

We conducted transect bird surveys (line-distance sampling) and vegetation measurements in grassland habitats at three eastern U.S. military installations: Westover Air Reserve Base (Massachusetts), Joint Base McGuire-Dix-Lakehurst (Lakehurst section; New Jersey), and Naval Air Station Patuxent River (Maryland). We also recorded mowing activity at the three sites through cooperative agreements with management crews. Surveys were conducted every two weeks during fall migration in 2007, 2008, and 2010, and during spring migration and breeding season in 2008, 2009, and 2011. We used published sources to identify species with high conservation concern (based on conservation plans) and those of high strike risk (two different methods evaluated based on two published hazard rankings). Finally, we quantified potential bird strike risk at each site using bi-monthly behavioral observation of birds near runways.

Benefit:

This study aids military airfield habitat managers in their efforts to reduce the risk of bird strikes while providing knowledge of how these efforts will affect species of conservation concern. The study will inform managers which “problem” or “high strike risk” species are most active near runways, and how these species respond to grass height management and mowing regimes. Management of sensitive grassland species will similarly benefit from an increased understanding of their habitat requirements. Baseline abundance information for both



species groups can be used to track population trends over time. Study results suggest that the Department of Defense can simultaneously provide a conservation benefit while minimizing risk from problem species, and that an optimal management solution can be reached through a collaborative process.



Late-season mowing at Joint Base McGuire-Dix-Lakehurst, New Jersey.

Accomplishments:

The final year of this project was completed in July 2011. During the three years of the study, we recorded a total of 28,000 bird sightings during more than 2000 transect surveys. Models based on vegetation structure (height and composition) performed better than those based on mowing history. Results, generally, did not support the prevailing assumption that maintaining vegetation between 7 to 14 inches high is optimal from an air safety point of view.

Specifically, at Naval Air Station Patuxent River, in spring and summer, risky bird species decreased in abundance with increasing vegetation height from about 3 inches until about 20-25 inches, above which they leveled off or increased again. At Joint Base McGuire-Dix-Lakehurst and Westover Air Reserve Base in summer, a similar negative relationship between high risk bird abundance and vegetation height was also observed up to about 20-25 inches, for one of the two methods used to classify species as high risk. Using the other method revealed no significant increase or decrease in high risk species with increasing vegetation height. Species of conservation concern, conversely, were more abundant in taller vegetation during summer at all three bases.

Analysis of ca. 1400 behavioral observation surveys revealed that the composition of frequent runway-

crossing species varied somewhat among the sites and by season. These frequent crossers included mainly species classified as high risk (e.g., European Starling, Turkey Vulture, gulls [*Larus* spp.]), and no species of conservation concern.

The three airfields studied had markedly different existing management strategies. These ranged from maintenance of the entire airfield at 7 to 14 inches (Naval Air Station Patuxent River), to partial airfield mowing (Westover Air Reserve Base), to minimal mowing during the breeding season (Joint Base McGuire-Dix-Lakehurst). The differences in model results and species composition among our three study sites highlight the importance of tailoring individualized airfield vegetation management plans based on site-specific data. The data provided in this study can be used to inform decisions regarding modification of these management regimes, both to deter high collision risk species and to benefit species of conservation concern. It can also serve as baseline data, against which results can be measured.

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Bobolink (*Dolichonyx oryzivorus*) nest at Westover Air Reserve Base, Massachusetts.