A. Title Page

Publication of Wildlife Monograph entitled "Habitat Use, Behavior, and Community Structure of Migratory Wetland Birds in the Rainwater Basin"

Final Report

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B. Restatement of problem researched or creative activity

The purpose of this grant was to fund the publication of a paper written by the principal investigator as a Wildlife Monograph entitled "Habitat Use, Behavior, and Community Structure of Migratory Wetland Birds in the Rainwater Basin." Publication of original research is essential to increasing the knowledge within the scientific community. Publications enhance the stature and reputation of the university they are affiliated with and are used as a means of evaluating individual faculty member's scholarly activity.

C. Brief review of the research procedure utilized

I submitted a manuscript to the Wildlife Society for publication as a Wildlife Monograph, which is currently under review. The manuscript represents the culmination of original research that I and several colleagues conducted over 3 years, investigating the habitat use, behavior, and community structure patterns of wetland birds during migration. When published, this grant will partially funding to publication costs of the Wildlife Monograph.

D. Summary of findings

Wildlife Monographs are a unique series of publications, presenting substantial, focused scientific investigations pertaining to the knowledge and management of wildlife. They offer results from major studies, including definitive synthesis and cohesive treatment of the topic. My research represents one of the only studies examining the importance of habitat use and wetland management on migration stopover sites for migratory wetland birds.

The manuscript was submitted to The Wildlife Society on 17 August 2007, reviewers were assigned on 24 August 2007 and is currently under review. I anticipate receiving a decision on whether the manuscript will be published in December 2007. If published, Arkansas Tech Faculty Development Grants will receive recognition as a major funding source of the publication .

E. Conclusions and recommendations

In conclusion, overall publication costs for a Wildlife Monograph are paid by the authors and are approximately $10,000. This grant partially funds ($3,000) the publication of the Monograph, pending its acceptance. Other financial support comes from the Rainwater Basin Joint Venture,

which has already contributed $5,000 towards publication costs, while Texas Tech University has contributed $2,000.

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Detailed Status Information

Manuscript #	2007-361
Current Revision #	0
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Title	HABITAT USE AND COMMUNITY STRUCTURE OF MIGRATORY WETLAND BIRDS IN THE RAINWATER BASIN
Running Title	Stopover Ecology of Wetland Birds During Migration
Manuscript Type	Wildlife Monograph
Special Section	N/A
Corresponding Author	Elisabeth Brennan (Arkansas Tech University)
Contributing Authors	Loren Smith , Mark Vrtiska , Theodore LaGrange
	Staging areas and migratory stopovers of wetland birds often function as geographic bottlenecks; entire populations within a flyway can be affected by the quality and quantity of available wetland habitat at stopover sites. This common dependence among migratory wetland bird species on staging sites has major implications for wetland conservation and restoration, especially at stopover sites that have undergone severe rates of destruction. Although approximately 90% of playa wetlands in the Rainwater Basin (RWB) region of south-central Nebraska have been destroyed, the region still provides essential stopover habitat for up to 10 million waterfowl each spring. In an effort to guide wetland restoration and conservation efforts, our objectives were to determine local (within wetland and immediate watershed) and landscape level factors influencing abundance and diversity of wetland birds during spring migration at RWB playas. Moreover, we evaluated community patterns and species associations to assess importance of assembly rules in structuring wetland bird communities during migration and how they may influence conservation and management strategies. We surveyed 36-40 playas biweekly in the RWB and observed approximately 1.6 million individual migratory wetland birds representing 72 species during 3 spring migrations 2002-2004. We tested hypotheses about how local and landscape variables influenced species richness and abundance of geese, dabbling ducks, diving ducks, and shorebirds. Wetland area had a positive influence on goose

Abstract

abundance in all years, whereas percent emergent vegetation and hunting pressure had negative influences. Models predicting dabbling duck abundance were variable among years; however, number of wetlands within 5 km consistently had a positive influence on dabbling duck abundance. Area of cropland within 10 km of a wetland had a positive influence on dabbling duck abundance in years with low precipitation (2002 and 2003), whereas percent cover of wetland vegetation positively influenced dabbling duck abundance in the wetter year (2004). Wetland area and percent of vegetation composed of inner marsh (drawdown and aquatic bed species) were positive predictors of diving duck abundance. Shorebird abundance was positively influenced by wetland area and area of agricultural land within 10 km. Total species richness was positively influenced by wetland area and negatively influenced by water depth. Species richness was also highest in wetlands with intermediate levels of vegetation.

Spatial and temporal species co-occurrence patterns of geese, dabbling ducks, diving ducks, and shorebirds were evaluated using null model analysis. Goose species co-occurred less often than expected in all years of the study, suggesting that goose species avoided each other during migration. Co-occurrence patterns among dabbling ducks were not different than expected by chance in all years, however, when evaluated at a weekly scale, dabbling ducks co-occurred less often than expected during weeks of peak migration (high abundance), indicating that dabbling duck species spatially segregated at high densities. Diving ducks co-occurred less often than expected in 2002 and 2004 but not in 2003, suggesting that diving duck species avoided one another during migration when wetland availability was low. Shorebird species co-occurred less often than expected in all years, suggesting that shorebirds were spatially segregated during migration, regardless of wetland availability. The majority of association values among lesser snow geese (Chen caerulescens) and dabbling species were positive, indicating that dabbling ducks are not avoiding wetlands with snow geese, a concern for waterfowl managers. However, we frequently observed snow geese and dabbling ducks using different microhabitats within a wetland, which could indicate that species associations and co-occurrence patterns are occurring at a finer spatial scale than measured in this study.

Wetland conservation in the RWB should focus on providing playa complexes for migratory birds, particularly dabbling ducks, in order to increase available habitat used by birds during migration. In addition, allowing playas to go through natural hydrologic cycles should promote intermediate levels of emergent vegetation, which will increase use by dabbling ducks, shorebirds, and wading birds, while discouraging snow goose use of these wetlands. Spring snow goose hunting, especially in low precipitation years, caused a re-distribution of geese and dabbling ducks to non-hunted wetlands as well as decreasing dabbling duck feeding opportunities. Therefore, this practice should be evaluated in terms of its overall effect on the avian community and not only the potential to reduce snow goose populations. During dry years, flooding temporary and seasonal wetlands and closing them to hunting could offset effects of hunting on non-target species by providing protected feeding areas. In addition, the ability to quickly and accurately assess

	wetland availability at migration stopover sites will be crucial to making the best possible management decisions on if, where, and when to distribute water in this highly modified landscape.
Associate Editor	Dr. Eric Hellgren
Keywords	community structure, habitat use, migration, Nebraska, Rainwater Basin, wetland birds
Duality Of Interest	No, there is no duality of interest that I should disclose, having read the above statement.

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All Reviewers Assigned	24th August 07 09:59:17
Under Review	17th August 07 18:42:32
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