

RESEARCH PROJECT SUMMARY

Project Title: Evaluating wetland-ecosystem health in the prairie pothole region of South Dakota using real-time nutrient dynamics of waterbirds.

Need: Despite decades of wetland and upland conversion to agriculture in South Dakota, these practices continue and may be accelerating, exacerbated by use of mechanized drain tiling that lowers ground-water tables and encourages production on traditionally marginal land. Consequences of conversion, such as sedimentation, basin consolidation, and hydrologic stabilization can gradually disrupt bottom-up processes in prairie wetlands (e.g., reduced invertebrate production). Conservation planning and management efforts require reliable information on the responses of birds to habitat loss and degradation for efficient allocation of resources and prediction of long-term consequences of management decisions. However, such information, broadly applicable, is often lacking or based on conjecture. Herein, we propose to address these information needs by implementing recently-developed techniques that allow waterbirds to serve as sentinel species and indicators of ecosystem health.

Objectives:

1. Use blood plasma-metabolites to evaluate “real-time” nutrient dynamics (i.e., lipid or protein accumulation or catabolism) of 2 sentinel waterfowl species (most likely blue-winged teal [*Anas discors*] and lesser scaup [*Aythya affinis*]) during spring across a gradient of landscape degradation in eastern South Dakota (e.g., from relatively intact wetland and upland systems to those with large-scale conversion and wetland loss).
2. Model metabolite dynamics as functions of large-scale landscape characteristics related to land use (e.g., percent cultivated) and wetland degradation (e.g., consolidation).
3. Examine abundance and distribution of waterfowl, waterfowl foods, wetland conditions, and watershed disturbance regimes within study blocks to understand factors influencing variation in the quality of wetlands used by sentinel species.

Study Location: Eastern South Dakota

Expected Completion: June 2016

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Funding:

Federal Aid to Wildlife Restoration, Study No. 7548, administered through South
Dakota Department of Game, Fish and Parks.