

**WDNR Office of the Great Lakes AOC Capacity Grants 2014
Scope of Work**

Project Title: Habitat Management for Migratory and Breeding Birds at the Cat Island Restoration Project

Applicant Names: Robert Howe, Tom Prestby, and Amy Wolf

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Congressional District: Eighth

Employers Identification Number (EIN number): 39-1805963

DUNS Number: 782431803

Project Location: Lower Green Bay and Fox River AOC-

The project will contribute to the Cat Island Restoration Project located within the Lower Green Bay Area of Concern (AOC) in Brown County, Wisconsin (Figure 1). Additional shoreline sites in the Lower Fox River and Green Bay AOC will be sampled in order to provide a context for assessing the regional significance of the Cat Island project.

Problem Statement:

The multi-million dollar Cat Island Restoration project in lower Green Bay represents one of the most ambitious habitat restoration projects in the entire Great Lakes. When finished, three artificial barrier islands will enhance 1,400 acres of wetland/aquatic habitat in the delta of Duck Creek, a major tributary draining an increasingly urbanized landscape. The Cat Island system will be formed over decades with dredge materials from the Green Bay navigation channel, re-establishing islands that were important features of the lower Green Bay ecosystem until they disappeared in the 1970's.

Field surveys during 2013 have documented a remarkable capacity for this system to attract and support migratory shorebirds, terns, gulls, herons, egrets, and even winter migrants. Guided by the 2013 Upper Mississippi Valley/Great Lakes regional shorebird conservation plan, Tom Prestby conducted standardized shorebird and tern surveys at 12 sites in lower Green Bay, WI from April through October 2013. By far the most productive site was the Cat Island restoration foundation, where Tom observed 4 tern species and 30 shorebird species, including the endangered Piping Plover (*Charadrius melodus*) and other species listed as “high peril” or “continental concern.”

Proposed Work:

Our project will use information from the 2013 and 2014 field surveys to provide long term recommendations for habitat management at the Cat Island restoration project. Specifically, we will address the following questions? 1) What specific habitat features (water depth, substrate type, shoreline topography) are most important for migratory shorebirds and colonial water birds such as terns, herons, and egrets in lower Green Bay? 2) What habitat features and specific locations are used by nesting shore birds and colonial water birds at the newly constructed Cat Island facility? 3) How do different bird species (including gulls, cormorants, and pelicans) interact at the Cat Island facility and nearby shoals and islands? 4) How does the presence of humans (including birdwatchers) affect bird activities at the Cat Island facility? 5) Where is the best location for an observation platform for visitors? (Where will safe access to birds be greatest while simultaneously avoiding significant disturbance to nesting birds?)

Information from the proposed monitoring project will help document the Cat Island Project’s contribution to the delisting of several Beneficial Use Impairments (BUI’s) in the Lower Fox River and Green Bay AOC, including: 1) degradation of fish and wildlife populations, 2) loss of fish and wildlife habitat, and 3) degradation of aesthetics. In the latter case, aesthetics and local ecotourism opportunities may be improved significantly by the development of recreational opportunities for birdwatchers and nature enthusiasts in lower Green Bay. The 2012 Remedial Action Plan Update for the Lower Green Bay and Fox River Area of Concern lists the Cat Island Restoration as a “key project” for addressing the loss of fish and wildlife habitat BUI. The proposed monitoring effort will help assess the success of this ambitious restoration initiative.

Shorebirds will be sampled using a modified version of the standard International Shorebird (ISS) protocol, essentially a series of unlimited-distance counts from a georeferenced shoreline location where a significant area of potential habitat is visible. Counts at 6 specific points on the Cat Island causeway will be conducted no less than twice per week. Locations of target species will be mapped in order to document critical areas of bird use and potential effects of human disturbance. Surveys will start when ice and snow melt exposes potential shorebird habitat (sand, rock, or mud) and will persist through June 10 for spring migration. Fall migration counts will begin in early July and will end in mid-November. These dates correspond with typical shorebird arrival and departure dates in central Wisconsin (eBird 2012, Robbins 1991). Duration of counts is not specified by the ISS protocol, but start time and end time will be recorded for each visit. Even if no target birds are present at a site, observers will remain at each point count for a minimum of 20 minutes.

All shorebirds, terns, and nesting water birds observed from the survey points will be recorded, along with distance and direction from the observer. Any arrival or departure by individuals or groups will be noted to the minute. Flyovers and flybys will be recorded but these birds will not be included in the analysis unless they had been clearly disturbed from feeding or resting areas by the observer. Terns flying but actively feeding are an exception and will be counted and included in analysis. A high quality spotting scope (30x power or greater) will be used in all cases to help identify species.

Habitat and microhabitat variables will be evaluated during each survey. Bird locations will be classified as rocky shore, sandy beach, sand bar, upper beach, dry mud, wet mud, mud-water film (1-2cm), shallow water (2-8cm) and deep water (8+cm) (Skagen & Knopf 1994). Water depth will be estimated by evaluating how much of the bird's legs are under water compared to average leg length for that species. Multiple pictures will be taken during each site-visit to monitor changes in exposed substrate and vegetation. Relevant cover types will be digitized into a GIS layer for subsequent analysis.

Data will be analyzed with a generalized linear model using both categorical and continuous predictor variables. The goal of this analysis will be to identify site attributes that are important for feeding, nesting, and resting by migratory shorebirds in Green Bay and to describe temporal variation in the abundance of migrants. Landscape habitat variables will be evaluated using GIS and will be incorporated into statistical models. The data analysis will help guide the management plan for the Cat Island Restoration Project by identifying important habitat features and describing species interactions that affect use of these habitats. Comparisons of data in 2013 and 2014 will illustrate how birds use the structure in the absence of construction activities, which ceased in 2013. We will collaborate with the Cat Island Advisory Committee and local agencies such as the Wisconsin DNR and USFWS to develop cost-effective strategies for monitoring, managing, and enhancing conditions for nesting and migratory water birds, including shorebirds.

Collaboration with partners: Collaborators on this project will include scientists and policy-makers from the Brown County Port & Resource Recovery Department, UW Sea Grant Institute, Wisconsin Department of Natural Resources, US Fish and Wildlife Service, and US Army Corps of Engineers.

Timetable: Monitoring data will be collected from July 2014 through November 2014, adding to preliminary data collected during 2013 and April-June 2014. Funding for the spring (and possibly early summer) field work in 2014 will be provided by the Cofrin Center for Biodiversity at UW-Green Bay. Prestby will meet with faculty supervisors Howe and Wolf regularly during the study period.

Milestones:

1. Start date July 1, 2014 (planning meeting, June 2014)
2. Field surveys July 1, 2014 – November 1, 2014
3. Progress report December 31st, 2014
4. Final report with recommendations ... May 15, 2015

Deliverables: The December progress report and the final report for this project will include details about 1) a description of study sites and methods, including modifications from the proposed protocol and identification of field personnel, 2) a summary of the total numbers and distributions of sample counts (including maps), 3) a summary of the total numbers of species and individuals recorded, and 4) analysis of spatial and temporal changes in shorebird counts during the study period, including comparisons with previous data collected earlier during 2013 and 2014. A comprehensive description of this and additional information and discussion will be part of Tom Prestby's Master's thesis in the Environmental Science and Policy Graduate Program at the University of Wisconsin-Green Bay. We also expect to submit the results for publication in peer-reviewed scientific journals and to present a summary of findings at professional meetings and workshops. Digital photos also will be included as part of the final report. All data and metadata will be stored at the Data Management Center of UW-Green Bay's Cofrin Center for Biodiversity.

Any reports, poster presentations, and publications developed as part of this funded project will acknowledge the Wisconsin DNR, the Lower Fox River and Green Bay AOC Habitat and Biota Subcommittee, and the US EPA's Great Lakes Restoration Initiative (GLRI).

Project Budget:

Budget Category	Cost
Student Hourly (\$12/hr x 440 hrs) 50% from July 2014 through November 2014	\$5,280.00
Student fringes (3%)	\$158.40
Travel to and from sampling sites	\$600.00
Total Direct Costs	\$6,038.40
Indirect Costs (15% x salaries + fringes)	\$815.76
Total Costs	\$6,854.16