**Lower Green Bay and Fox River Area of Concern Habitat Restoration Plan and Path Toward Delisting**

**GL-00E01312 sub 4**

**Wisconsin DNR / USEPA Project Report #11**

**(1 July – 30 September 2017)**

3 October 2017

**UW-Green Bay Project ID:** 144-PRJ93PU

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**Project Objectives:**

1. Assess the current status of the fish and wildlife habitat in the AOC;

2. Identify specific opportunities for protection, restoration, and rehabilitation of fish and wildlife habitat in the AOC and contributing watershed and secondarily identify opportunities to reduce excessive nonpoint pollution potentially impacting fish and wildlife;

3. Develop monitoring protocols for measuring the status of fish and wildlife habitat in the AOC;

4. Establish quantitative targets for de-listing the AOC with respect to two wildlife-related beneficial use impairments (BUIs).

**Progress summary:**

Significant progress was made during this quarter in all three major aspects of the project – fieldwork, data analysis/synthesis, and outreach. Amy Wolf and James Horn led field efforts to identify and map beds of submerged aquatic vegetation in lower Green Bay and the Fox River, including a subcontract with Christopher Houghton for sonar analysis of Deadhorse Bay. This work enabled us to obtain closer looks at the overall habitat condition of many areas under high water condition (contrasting with 2015 field surveys, during which lake levels were much lower). SAV beds, like waterfowl concentrations from the fieldwork of Tom Prestby, are being digitized and added to the project GIS database under Erin Giese’s guidance. Mike Grimm (TNC) conducted additional fieldwork on areas along the East River and Duck Creek. Based on these surveys and other sources of information about potential fish breeding locations, we expanded the AOC project area to include a larger stretch of the East River, extending to Dickinson Road (County G). We also added a larger portion of lower Duck Creek. These areas – technically part of the watershed focus of The Nature Conservancy – are added to the general analysis because of their potential direct importance to AOC population sand habitats.

We implemented a significant change in the analytical framework during early late August and September. Previously, the assessment/de-listing tool was designed to provide quantitative de-listing targets for 1) populations of species or species groups and 2) “priority areas,” most of which were large and encompassed a mosaic of habitat types. The new framework replaces the priority areas with individual habitat types, thus aligning more closely with the specific BUI involving fish and wildlife habitat. This change was precipitated by our internal discussion about methods for objectively measuring and monitoring the condition of the priority areas. The new focus on habitat types has important implications for the delisting process. Not only does it improve the objectivity of our proposed scoring system, but it also opens restoration opportunities to all areas in the AOC, not just the list of identified priority areas. Of course, we expect that most future restoration measures will occur in the priority areas (that is where the best habitats remain), but the new framework is more flexible. The list of priority areas will resurface in our specific project recommendations. The success of these projects will influence the de-listing status not by qualitative estimates of site condition but by the impact of the project on measurable conditions of populations or habitats.

Stakeholders continue to be important contributors to the project. All 3 PIs attended a “Science Summit” on the Green Bay ecosystem on July 18-20. Discussions included important topics for the AOC, including sessions on habitat, critical species, climate change, population monitoring, and water quality. On August 3rd, we presented our de-listing framework (prior to revision) to the AOC Technical Stakeholders, and on September 28 Howe and Giese presented an update to U.S. GLRI Agencies (USEPA, Army Corps of Engineers, Wisconsin DNR) in Milwaukee. Howe also has participated regularly in meetings with a Green Bay Restoration Team involving researchers from UW-Green Bay (Matt Dornbush, Kevin Fermanich Amy Carrozzino-Lyon), UW-Extension (Pat Robinson) and Ducks Unlimited (Brian Glenzinski). He and Wolf also have been part of the Green Bay Blueprint Project led by Betsy Galbraith of the US Fish and Wildlife Service.

**Funding:** *(Numbers below are tentative and my change based on final analysis by Grant Controller Jeffrey Selner)*

Overall project expenditures currently total $441,408 from the total project budget of $464,052.

One invoice from The Nature Conservancy of $56,983 was paid during this quarter, leaving

10.12% ($20,616) of TNC’s adjusted subcontract budget of $203,719 yet to be invoiced.

With the TNC transfer of $14,870 (see Progress Report #10), the revised UWGB budget is now $234,333. As of 1 October, the UWGB portion of the main project had spent $232,305, or 99.1% of the adjusted budget. The remaining amount for the UWGB portion of the main project budget (not including the amendment) is only $2,028 (0.9%).

UWGB costs for the quarter totaled $12,723, including summer salary for Amy Wolf ($7,267), fringe benefits ($3,125), travel and travel-related expenses ($436), supplies ($337), and indirect costs ($1,559).

A separate report describing progress and budget will be submitted for the waterfowl/plant biodiversity amendment. In order to simplify budget reporting and to reflect the reality of when the work was performed, we have left expenses for waterfowl field surveys by Tom Prestby in this original AOC project budget. Waterfowl surveys are consistent with (although significantly adding to) the original goals and work plan of the project. Analysis of the waterfowl and plant biodiversity “hotspot” surveys by Wolf (non-cash match), Giese, and Horn will be included in the amendment budget (reported separately). In other words, nearly all of the funds in the original project budget have been spent, so remaining UWGB expenses will mainly be covered by the balance remaining in the amendment budget.

**Deliverables and Work Accomplishments:**

Draft versions of nearly all UW-Green Bay project deliverables other than the final report and explanatory narratives are now completed. Major elements of the final report already have been written, but completion of the report and accompanying materials obviously will be the focus of our work during the next quarter.

**Problems Encountered:**

No serious problems have been encountered during this reporting period.

**Planned Tasks / Deliverables During Next Quarter:**The main emphasis now is completion of the final report and development of specific deliverables, including maps, web site, and information databases. We will continue to work with TNC biologists to integrate the two elements of this project. We also will continue to discuss and articulate monitoring metrics that will be recommended for assessing the current and future condition of AOC habitats and species/species groups. These metrics will be incorporated into the assessment/de-listing framework.

Ongoing collaboration with TNC’s watershed component of this project will continue, with significant efforts to merge these approaches into a single, comprehensive strategy for de-listing.

**Appendix 1.** Summary of AOC Meetings between 1 July and 30 September 2017 (Written by Erin Giese on 2 October 2017).

* **5 July 2017**
	+ Attendees: UW-Green Bay
	+ Purpose: Planned for upcoming submergent aquatic vegetation (SAV) summer field mapping and inventory with Dr. Amy Wolf, Dr. Jay Horn, Dr. Bob Howe, Erin Giese, Colton Tanner (undergraduate student), and Maria Otto (undergraduate student).
* **13 July 2017**
	+ Attendees: UW-Green Bay, Wisconsin Department of Natural Resources (WDNR), U.S. Environmental Protection Agency (EPA), and The Nature Conservancy (TNC)
	+ Purpose: Discussed setting targets for the two fish and wildlife beneficial use impairments (BUI) in preparation for upcoming Lower Green Bay and Fox River Area of Concern (AOC) Technical Stakeholder’s Meeting (3 Aug 2017).
* **28 July 2017**
	+ Attendees: UW-Green Bay
	+ Purpose: Discussed how to digitize SAV beds using ArcGIS with Wolf, Horn, Howe, Giese, Tanner, Otto, and Cody Becker (undergraduate; GIS student employee).
* **2 August 2017**
	+ Attendees: UW-Green Bay

Purpose: Wolf, Horn, and Giese met to spatially document where there are stretches of shoreline that do not have any SAV.

* **3 August 2017**
	+ Attendees: UW-Green Bay, WDNR, TNC, and many local stakeholders
	+ Purpose: Howe, Wolf, and Giese presented their latest update at this WDNR’s AOC Technical Stakeholder’s Meeting. They reviewed how to use their AOC Fish and Wildlife Assessment Tools, presented recommended BUI delisting targets, and generated discussion with local stakeholders.
* **8 August 2017**
	+ Attendees: UW-Green Bay and TNC
	+ Purpose: Howe, Wolf, and Giese met with TNC’s Nicole Van Helden, Mike Grimm, and Nick Miller to discuss how to integrate TNC’s watershed work into UW-Green Bay’s efforts. Miller presented TNC’s online, statewide GIS tool and discussed how this tool could be tailored to the AOC Project.
* **9 August 2017**
	+ Attendees: UW-Green Bay and TNC
	+ Purpose: Grimm met with Howe, Wolf, and Giese to discuss how or if TNC should add important watershed sites into UW-Green Bay’s AOC priority areas.
* **11 August 2017**
	+ Attendees: UW-Green Bay

Purpose: Digitized SAV beds using ArcGIS with Wolf, Horn, Howe, Giese, Tanner, and Becker.

* **18 August 2017**
	+ Attendees: UW-Green Bay

Purpose: Weekly update meeting with Howe, Wolf, and Giese.

* **18 August 2017**
	+ Attendees: UW-Green Bay

Purpose: Digitized SAV beds using ArcGIS with Wolf, Giese, Tanner, and Becker.

* **25 August 2017**
	+ Attendees: UW-Green Bay

Purpose: Digitized SAV beds using ArcGIS with Wolf, Giese, Tanner, and Becker.

* **28 August 2017**
	+ Attendees: UW-Green Bay

Purpose: Howe, Wolf, and Giese worked on building their AOC Fish and Wildlife Habitat Assessment Tool.

* **13 September 2017**
	+ Attendees: UW-Green Bay
	+ Purpose: Weekly update meeting with Howe, Wolf, and Giese.
* **20 September 2017**
	+ Attendees: UW-Green Bay and WDNR
	+ Purpose: Howe, Wolf, and Giese met with WDNR’s Vic Pappas and Donalea Dinsmore in order to prepare for the U.S. Great Lakes Restoration Initiative (GLRI) Agencies and WDNR’s Areas of Concern Meeting (27-28 September 2017). Pappas invited UW-Green Bay to present an overview of their proposed AOC Fish and Wildlife Assessment Process at this meeting.
* **22 September 2017**
	+ Attendees: UW-Green Bay

Purpose: Howe, Wolf, and Giese designed a diagram that visually explains the AOC Fish and Wildlife Assessment Process.

* **27 September 2017**
	+ Attendees: UW-Green Bay
	+ Purpose: Weekly update meeting with Howe, Wolf, and Giese.
* **28 September 2017**
	+ Attendees: UW-Green Bay, U.S. EPA, WDNR, and others
	+ Purpose: Howe and Giese presented an overview of their proposed AOC Fish and Wildlife Assessment Process.