

Selection of Geographical Units of Interest within the Lower Green Bay and Fox River Area of Concern

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Project:

Lower Green Bay and Fox River AOC Habitat Restoration Plan and Path Toward Delisting

Purpose:

With funding from the U.S. Environmental Protection Agency (DUNS#: 782431803), a team of researchers from the University of Wisconsin-Green Bay (principal investigators Dr. Robert Howe and Dr. Amy Wolf) is leading an effort to write a plan that leads to the delisting of two beneficial use impairments within the Lower Green Bay and Fox River Area of Concern (LGB&FR AOC; Fig. 1), namely the loss of fish and wildlife habitat and degradation of fish and wildlife populations. In order to collect and organize information known on LGB&FR AOC biota, the team divided this larger region into two smaller study units called “regions” and “project areas.” The team’s step-by-step process for making these divisions is outlined in this document. The UW-Green Bay team who made these divisions consisted of the following people: Dr. Robert Howe, Dr. Amy Wolf, Erin Giese, Michael Stiefvater, Stephanie Beilke, and Kimberlee McKeefry. These regions and project areas are used and referenced in the LGB&FR AOC Biota Database.

Selection:

The LGB&FR AOC encompasses the following geography: “the last seven miles of the Fox River from the De Pere Dam to the mouth and extends into lower Green Bay up to an imaginary line crossing the bay from Long Tail Point to Point au Sable” (<http://dnr.wi.gov/topic/greatlakes/greenbay.html>; Fig. 1). The UW-Green Bay team divided the LGB&FR AOC into five geographical regions of interest: “East Shore,” “Lower Bay,” “Bay of Green Bay,” “Fox River,” and “West Shore” (Fig. 2). Regions were selected based on simple geography so that each region consisted of areas that may share relatively similar habitat features. The “Lower Bay” region includes the southern shoreline of Green Bay and stretches in between the “East and West Shore” regions, which are made up of their respective shorelines. The “Fox River” region contains the portion of the LGB&FR AOC from the mouth of the Fox River to the De Pere Dam, as well as the East River watershed.

Each region was further divided into a total of 15 project areas (Fig. 3). Project areas were determined by relative proximity to special areas of conservation interest, such as parks and natural areas. All project areas are adjacent and non-overlapping so that any given point along the shoreline or within one of the waterways of the LGB&FR AOC will belong within a single project area.

The boundaries of project areas were determined using GIS data (file name: “sumrel5x5971.shp”), which were provided by Dr. Terry Brown from the University of Minnesota-Duluth’s Natural Resources Research Institute on 14 October 2014 and subsequently given to

the Cofrin Center for Biodiversity's Senior Research Specialist, Erin Giese. Dr. Brown and other Great Lakes environmental indicator researchers use these watershed units for all current coastal wetland-related indicator research and recommended that the UW-Green Bay team use them for their purposes. This GIS file organizes all of the Great Lakes shoreline into individual watershed units (WU) represented as polygons. Each polygon is represented by a number, and within the LGB&FR AOC, the numbers range from 1451-1481. The UW-Green Bay team selected adjacent polygons that they determined best represented each project area.

Exceptions to the watershed polygon representation include the "Bay of Green Bay" region and the "Long Tail Point" project area. The "Bay of Green Bay" region includes the water and islands of the Bay, which were not defined by the GIS file. Special project areas within the "Bay of Green Bay" include the pelagic zone (open waters of the Bay), islands (including man-made islands and the Cat Island causeway), and the mouth of the Fox River. "Long Tail Point" also was not included in the GIS file, so a new polygon was constructed in GIS (there is no existing WU number). The final project areas and regions are stored in file "AOC_GeoUnits20141027.shp," which was created by Stephanie Beilke.

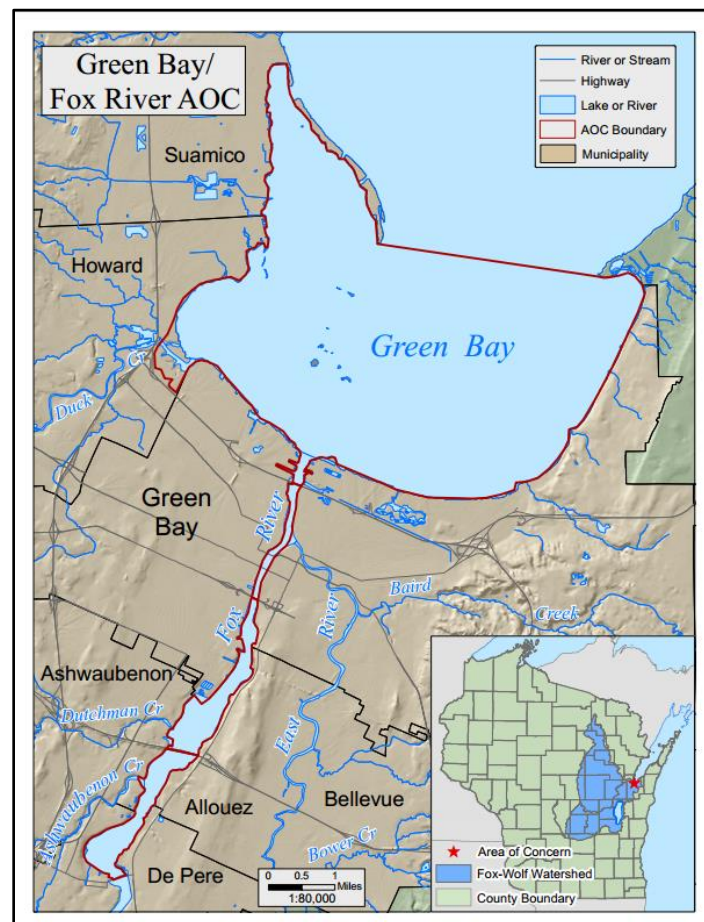


Figure 1. Boundaries of the Lower Green Bay and Fox River Area of Concern located in northeastern Wisconsin (image downloaded from: http://dnr.wi.gov/topic/greatlakes/documents/FoxGBAOC_Gen.pdf).

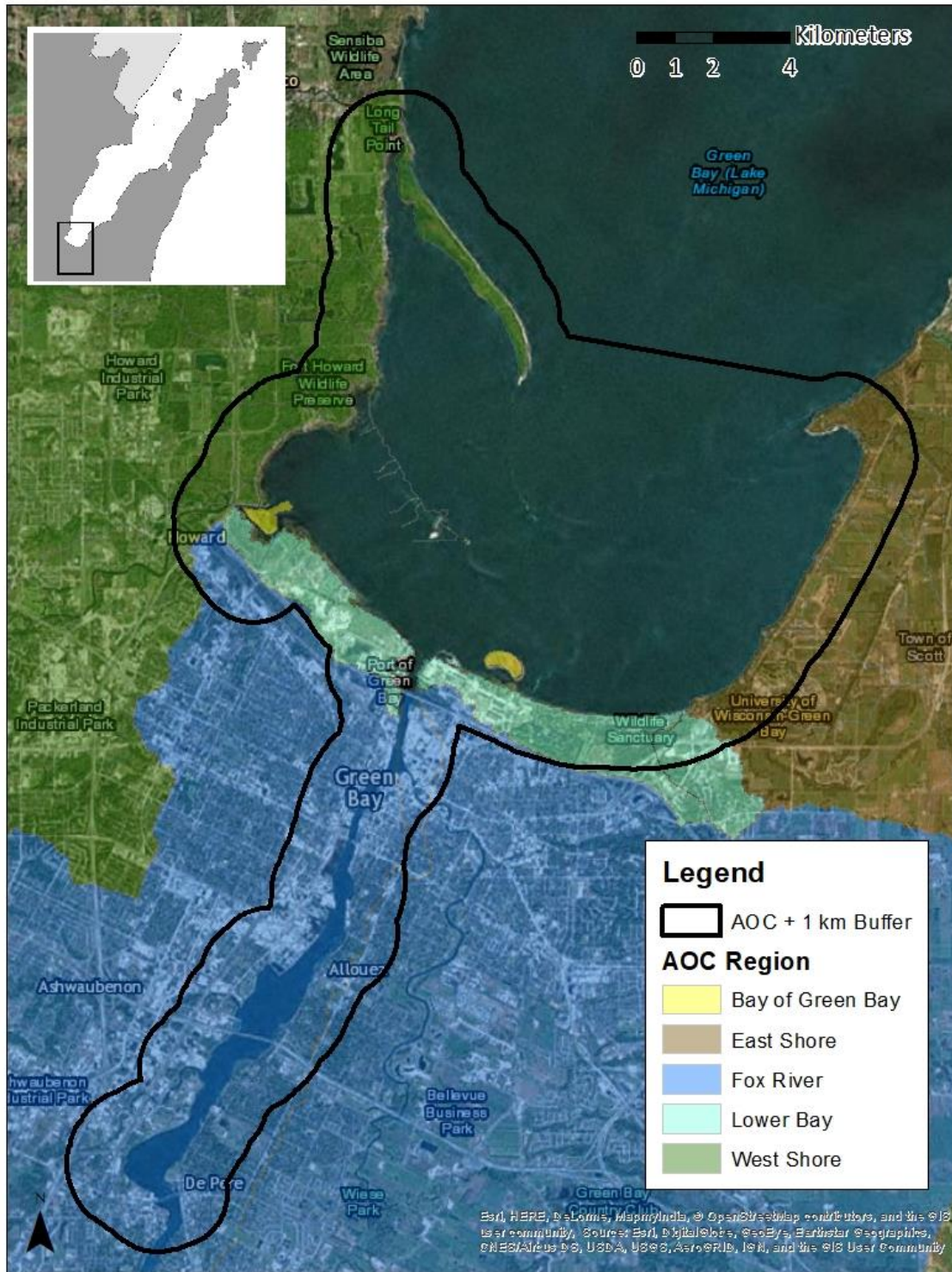


Figure 2. Five geographical regions within the Lower Green Bay and Fox River Area of Concern (LGB&FR AOC). Excluding the “Bay of Green Bay,” each region extends inland up until the 1 km buffer (thick black line) of the LGB&FR AOC boundary (Fig. 1). Note that in addition to islands, the “Bay of Green Bay” also consists of the pelagic water zone of the Bay.

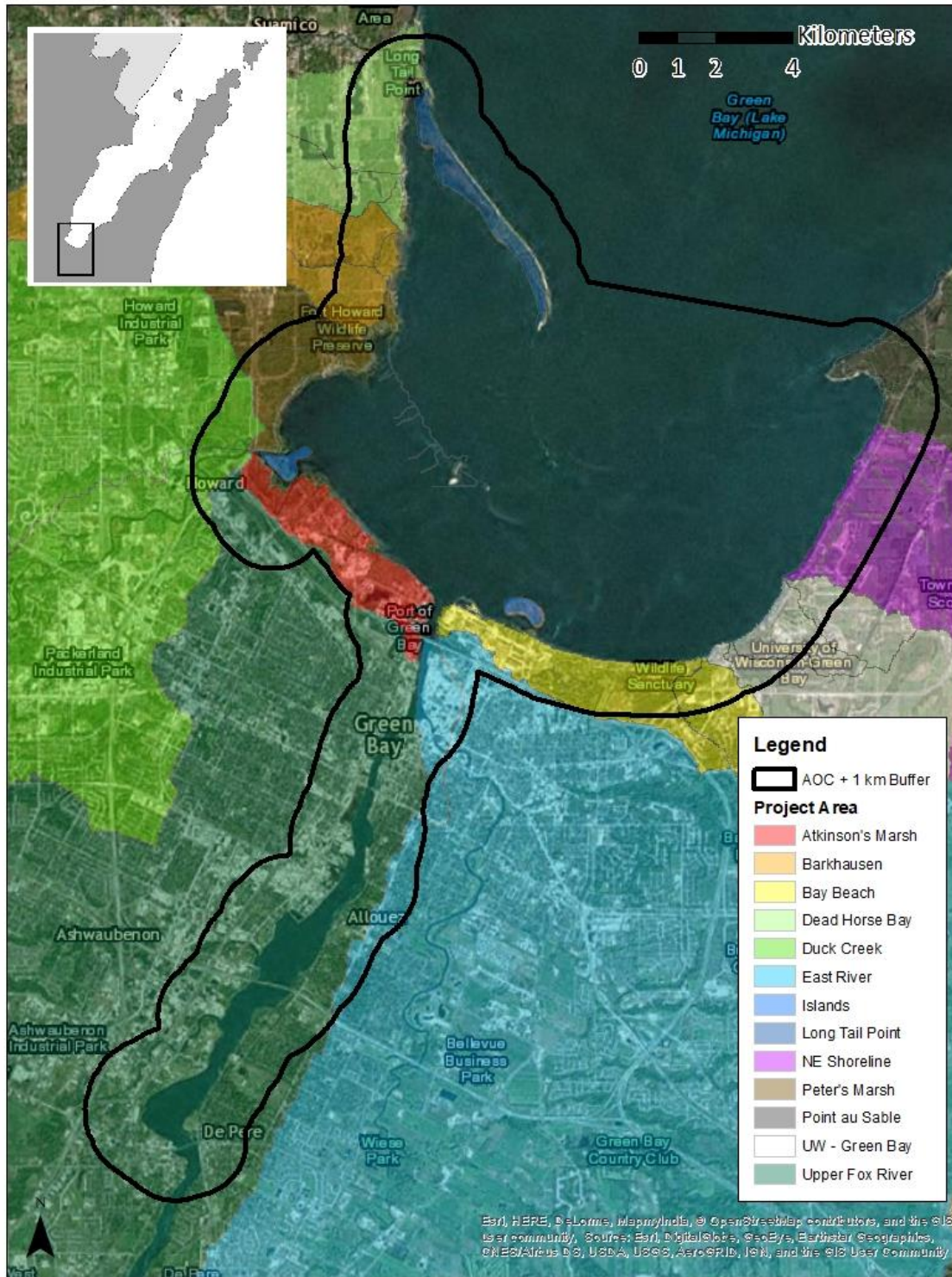


Figure 2. Fifteen project areas within the Lower Green Bay and Fox River Area of Concern (LGB&FR AOC). Excluding the “Pelagic Zone” and “Islands,” each project area extends inland up until the 1 km buffer (thick black line) of the LGB&FR AOC boundary (Fig. 1). The “Pelagic Zone” is simply the water area, or pelagic zone, of the lower “Bay of Green Bay.” The “Mouth of Fox River” is the small opening of the Fox River where the river meets the lower Bay.

Below is a list of all regions (I-V), project areas (a-e), and watershed units (if applicable):

- I. "East Shore"
 - a. "Point au Sable"
 - i. WU 1479-1481
 - b. "Northeast Shoreline"
 - i. WU 1473-1478
 - c. "UW-Green Bay"
 - i. WU 1469-1472

- II. "Lower Bay"
 - a. "Bay Beach"
 - i. WU 1467-1468
 - b. "Atkinson's Marsh"
 - i. WU 1463

- III. "Bay of Green Bay"
 - a. "Pelagic Zone"
 - b. "Islands"
 - c. "Mouth of Fox River"

- IV. "Fox River"
 - a. "East River"
 - i. WU 1465-1466
 - b. "Upper Fox River"
 - i. WU 1464

- V. "West Shore"
 - a. "Duck Creek"
 - i. WU 1461-1462
 - b. "Peter's Marsh"
 - i. WU 1457-1460
 - c. "Barkhausen"
 - i. WU 1454-1456
 - d. "Dead Horse Bay"
 - i. WU 1451-1453
 - e. "Long Tail Point"