

Appendix 2: Anuran Survey Methodology (2015)

Field Work

In order to assess the current condition of AOC biota, we started to identify information gaps during Phase I and determined that anurans (frogs/toads only) have only been surveyed in Great Lakes coastal wetlands within the LGB&FR AOC through USEPA-funded projects in which Howe and Giese participate, most recently the Great Lakes Coastal Wetland Monitoring Program (CWMP; 2011-2017; Uzarski et al. 2017; <http://www.greatlakeswetlands.org>). Small, inland, and fairly open wetlands (primarily dominated by herbaceous plants, such as cattails [*Typha* spp.]) within the LGB&FR AOC (e.g., along the Fox River) have not been recently surveyed for anurans using standardized methods. Under the guidance of Robert Howe and Amy Wolf, Erin Giese and Stephanie Beilke conducted field scouting and identified 13 locations (Figure 1, Appendix 2) within the LGB&FR AOC that trained UW-Green Bay students surveyed for anurans in the spring and summer of 2015. Once a point count location was established, Giese and Beilke filled out a Site Description form (one per location), which documents the location's name and geospatial coordinates, safe parking areas, dominant plants, compass bearing (used for repeatability of anuran and wetland bird surveys), property information, and any other helpful notes (Figure 2, Appendix 1.1).

Anurans were sampled using the same, widely accepted protocol used for the CWMP, namely a 3-minute, unlimited-distance point count, in which trained observers recorded all anurans heard regardless of how far away an individual was calling from the observer (Great Lakes Coastal Wetlands Consortium 2014, pp. 137-141, Uzarski et al. 2017). Numbers of individuals were either counted individually (if calls were not simultaneous), estimated (if some calls were simultaneous), or recorded as a "chorus" (when individuals could not be reliably estimated) on the point count form (Figure 2, Appendix 2). Point count locations were sampled between a half-hour after sunset and 4 h and surveyed three times throughout the spring and summer (mid-April through late June 2015) in order to detect different anuran species as they become active after hibernation. Visits were separated by at least 15 days and when minimum overnight temperatures were met for each visit (first: 5°C, second: 10°C, and third: 17°C). Surveys were conducted during relatively good weather conditions with minimal wind and precipitation. Basic weather information (e.g., cloud cover, wind), air and standing water temperatures, start time, compass bearing, noise level, and geospatial coordinates of point count locations were recorded at each survey.

Six UW-Green Bay students (advanced undergraduates or graduates) were trained on how to conduct anuran surveys on 23 and 26 March 2015. For safety purposes, surveys were conducted by a team of two students, in which one student conducted the survey itself and the other student collected basic weather information, helped with navigation, and collected geospatial coordinates of the point count locations. Students who conducted the anuran surveys were also required to pass the rigorous certification test, as is done for the CWMP (see QAPP section "Personnel, Special Training Requirements, or Certifications").

Data Entry

After the field season, two UW-Green Bay students double entered anuran data into a MS Excel spreadsheet created by Giese that employed data validation techniques to minimize data entry error; the two entries were subsequently compared to produce a final, high quality data set (see "Data Management" for more details on data entry). Accompanying metadata were later added.

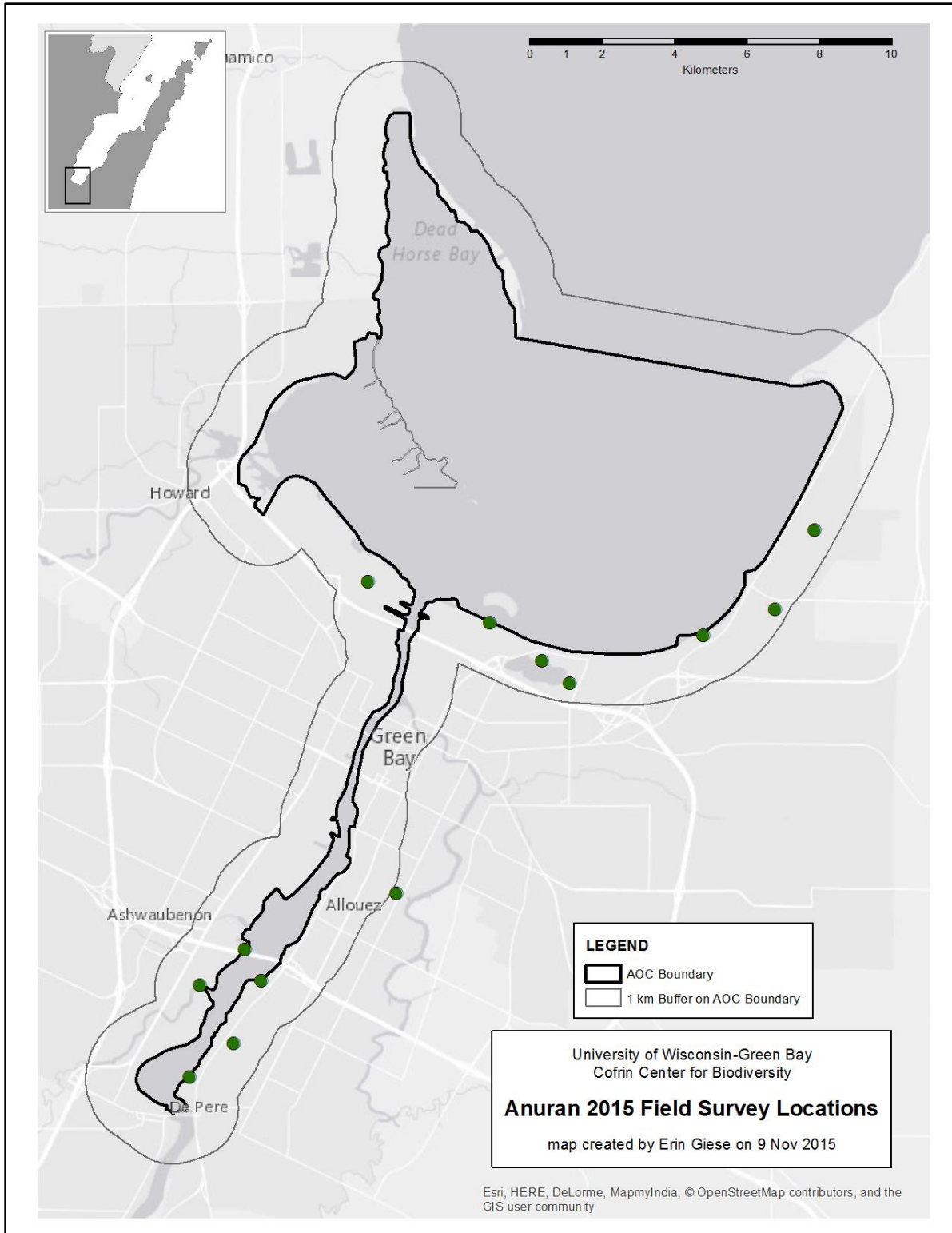


Figure 1. Point count locations ($n = 13$) positioned in open wetlands primarily dominated by herbaceous plants that were surveyed for anurans (frogs/toads only) in the spring and summer of 2015. They are located within 1 km of shoreline at Lake Michigan/Green Bay high water level of 177.2 m AMSL in the Lower Green Bay and Fox River Area of Concern (AOC) in Wisconsin. Note that one point is located just slightly outside this 1 km buffer in the village of Allouez (~100 m). Basemap sources: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community. Map created in ArcGIS 10.5 (Environmental Systems Research Institute 2016).

