***Project Title:*** Milwaukee Estuary Area of Concern Fish Population Target Refinement

***Project Applicant***: United States Geological Survey

***Contact Person***: Daniel Sullivan, United States Geological Survey, Wisconsin Water Science

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***Project Location:*** Milwaukee Harbor, Milwaukee River, Kinnickinnic River, and the Menomonee

River.

***Problem Statement:***

Relevance: The Milwaukee Estuary Area of Concern Beneficial Use Impairment “Degraded Fish and Wildlife Populations” was identified by the International Joint Commission in 1987. A comprehensive survey of relative population abundance of native fish species scheduled for 2014 will provide the opportunity to compare abundances prior to 1987 and will provide an understanding of the degree of improvement in fish populations. Ideally, an increase of all native fish populations would be evident. However, declines (or even increases) in the populations of some native fish species may be due to conditions external to the AOC. Therefore, identification of native fish species most indicative of improvements in the AOC will be advantageous and will allow fish population targets to be focused on those species most directly impacted by AOC activities rather than general conditions in Lake Michigan.

For the purposes of removal of this beneficial use impairment, specific native indicator species will include northern pike, greater redhorse, lake sturgeon, and walleye. Although these four species are thought to be broadly representative of fish of life histories and morphometry of various fish species, the direct correlation of their population success to those of other fish populations is not defined. In 2013, we will evaluate the list of originally captured native fish species to refine the list of species and acceptable increases in relatively density based on life history, ecology, and utilization of the AOC proper. Likely mechanisms of population level increases or decreases external to the AOC will be documented. The results of this evaluation will likely result in a less conservative but more precise targets with regard to species and relative densities.

While these two measures (focal species and all native species) provide an opportunity to examine relative population density in a temporal context, a spatial comparison to reference site is also necessary. To compare the Milwaukee AOC fish populations of native indicator species to reference sites we will rely on large river IBI scores collected in the sampling effort to commence in 2014. The methodology in the proposed 2014 effort above focuses on the relative abundance of fish populations within the estuary area of the Milwaukee River AOC. Therefore, the status of fish populations within the expanded AOC boundary are not necessarily reflected. Fish populations are expected to be considerably more robust within the expanded AOC boundary. However, to ensure that this circumstance is supported, we propose a review of existing fish population data for fish based IBI scores within the expanded AOC as part of the individual species evaluation. We will consider a mean value of “Fair” from at least 5 appropriate IBI scores that occur in at least 3 separate years to be evidence that fish populations are not substantially impaired within the expanded AOC boundary. If insufficient data are available, additional sampling may be required. Work proposed here will identify and summarize existing relevant IBI data in the area of the expanded AOC boundary, identify future data needs if present, and suggest sampling design for obtaining additional data if necessary.

***Proposed Work:***

1) Create an electronic database, in format compatible with WDNR SWIMS database (e.g. ACCESS or EXCEL), of Holey (1986) summary data and provide a review of relative population statusof all native fish species captured in the Holey 1986 survey with respect to life history, ecology, and utilization of the AOC.

2) Identify and summarize existing relevant IBI data within the expanded AOC area, identify future data needs if present, and suggest sampling design for obtaining additional data if necessary.

3) Provide summary information in the form of interim and final reports and present findings to the Milwaukee AOC Stakeholder Input Group, the Milwaukee Technical Advisory Committee, and Wisconsin DNR staff.

***Collaboration with partners:*** This proposal was developed with input from the Milwaukee Estuary

Fish and Wildlife Technical Team, which includes representatives from a variety of state, local, and federal agencies and nonprofit organizations. The Technical Team has endorsed this proposal and the provisions therein.

***Deliverables and Timetable:***

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| Timeframe | Task |
| October 2013 | -Development of the Quality Assurance Project Plan |
|  | -Enter Holey (1986) summary data into database format |
|  | -Submission of Holey (1986) database to WDNR |
| November 2013-January 2014 | -Develop species summaries (life history, ecology, and utilization of Milwaukee AOC) for each native species captued in Holey (1986) |
|  | -Develop recommendations for species inclusion as target species in Fish Population Beneficial Use Impairment assessment |
|  | -Quarterly update due November 1st, 2013 |
|  | -Summary and recommendations shared with AOC Fish and Wildlife Technical Team and WDNR |
| February-April 2014 | -Collect existing and relevant fish IBI data from the Milwaukee AOC (including expanded boundary) |
|  | -Quarterly update due February 1st, 2013 |
|  | -Summarize existing fish IBI data |
|  | -Summary of existing IBI data and recommentations for any necessary data collection shared with AOC Fish and Wildlife Technical Team and WDNR |
|  | -Final Report including species and fish IBI summaries and recommendations submitted to the WDNR April 31st, 2014 |
|  | -2013 grant ends April 30th, 2014 |

***Project Budget:***

-Staff time: 800 hours \* $30/hr = $24,000

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References

Holey, M.E. 1986. Milwaukee Harbor estuary fish survey and toxic substance evaluation 1983. Wisconsin Department of Natural Resources, 600 E. Greenfield Avenue, Milwaukee WI 53204.

Lyons, J., R.R. Piette, and K.W. Niermeyer. 2001. Development, validation, and application of a fish-based index of biotic integrity for Wisconsin’s large warmwater rivers. Transactions of the American Fisheries Society 130: 1077-1094.