

## FINAL REPORT

### White Lake Area of Concern Habitat Restoration Project

#### **Assistance ID No.**

GL-00E00572-0

#### **EPA Project Officer**

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#### **Project Location**

White Lake Area of Concern, Muskegon County, Michigan  
HUC Code: 04060101-0904

#### **Brief Project Summary**

The Muskegon Conservation District, with the White Lake Public Advisory Council, implemented a comprehensive shoreline habitat restoration project in the White Lake Area of Concern to restore shoreline, wetland, and habitat corridors at ten sites surrounding White Lake. In total, 8,007 lineal feet of shoreline were restored, 38.16 acres of wetlands and aquatic habitat created/restored, 14.87 acres of riparian and upland habitat corridors were reconnected and restored, and 51,851 cubic yards of shoreline/marine debris were removed. Restoration goals for project were exceeded within allocated budget and successful completion of this project will delist two Beneficial Use Impairments, *Loss of Fish and Wildlife Habitat* and *Degraded Fish and Wildlife Populations*

## Project Description

The Muskegon Conservation District (District) and the White Lake Public Advisory Council (Council) completed the White Lake AOC Habitat Restoration Project for BUI Delisting to address the loss of shoreline and nearshore habitat. The Council, District, and the public and private partners involved in the project implemented habitat restoration at ten sites on the White Lake shoreline, restorations essential for delisting of the Area of Concern's two habitat related Beneficial Use Impairments: *Loss of Fish and Wildlife Habitat* and *Degradation of Fish and Wildlife*.

Prior to implementation the District and Council had developed targets and criteria for White Lake's eight Beneficial Use Impairments, including *Loss of Fish and Wildlife Habitat* and *Degradation of Fish and Wildlife Populations*, which were among those approved by the Michigan Department of Environmental Quality in May 2009. Building upon the White Lake Shoreline Management Plan, the District and the Council originally identified specific priority parcels for restoration, and summarized the data in a White Lake Shoreline Habitat Restoration Blueprint. The White Lake AOC Habitat Restoration Project selected seven sites for restoration to meet the needs of the BUI delisting; and completed restoration on six of those sites as part of this project. One of the original was removed during the project as the landowners were also in the midst of a redevelopment for the site and pulled out of the project because of possible design conflicts. However, with the funding from that original site, cost savings attributed to the bidding process, and implementation efficiencies the District was able employ four new sites were added. In total ten sites were restored, exceeding original restoration estimates and goals.



### Habitat Restoration Site Summary

<b>Occidental Chemical (43.387500 / -86.377192)</b>		
Wetland/Aquatic Acreage Restored: 10.2	Lineal Ft. of Shoreline Restored: 2343	Cu. Yds. Debris Removed: 20700
Riparian/Upland Acreage Restored: 7.6	Other:	
<b>Ravenswood (43.395870 / - 86.369589)</b>		
Wetland/Aquatic Acreage Restored: 3.46	Lineal Ft. of Shoreline Restored: 609	Cu. Yds. Debris Removed: 607
Riparian/Upland Acreage Restored: .18	Other: 497 lineal feet of sheet-pile seawall removed	
<b>Maple Beach (43.401480 / -86.359162)</b>		
Wetland/Aquatic Acreage Restored: 3.4	Lineal Ft. of Shoreline Restored: 240	Cu. Yds. Debris Removed: 2081
Riparian/Upland Acreage Restored: .05	Other:	
<b>Boat Launch - Shoreline (43.411548 / -86.357239)</b>		
Wetland/Aquatic Acreage Restored: 1.4	Lineal Ft. of Shoreline Restored: 620	Cu. Yds. Debris Removed: 532
Riparian/Upland Acreage Restored: .11	Other:	
<b>Boat Launch – Two Track (43.412875 / -86.359280)</b>		
Wetland/Aquatic Acreage Restored: 3.5	Lineal Ft. of Shoreline Restored: 440	Cu. Yds. Debris Removed: 9400
Riparian/Upland Acreage Restored: 0	Other:	
<b>Weathervane (43.414190 / -86.353223)</b>		
Wetland/Aquatic Acreage Restored: 2.7	Lineal Ft. of Shoreline Restored: 620	Cu. Yds. Debris Removed: 837
Riparian/Upland Acreage Restored: .2	Other:	
<b>Montague Dump (43.416812 / -86.351465)</b>		
Wetland/Aquatic Acreage Restored: 3.7	Lineal Ft. of Shoreline Restored: n/a	Cu. Yds. Debris Removed: 13302
Riparian/Upland Acreage Restored: .13	Other:	
<b>Causeway (43.412289 / -86351056)</b>		
Wetland/Aquatic Acreage Restored: 1.9	Lineal Ft. of Shoreline Restored: 1304	Cu. Yds. Debris Removed: 1030
Riparian/Upland Acreage Restored: 1.42	Other:	
<b>Svensson Park (43.396694 / -86.354822)</b>		
Wetland/Aquatic Acreage Restored: 4.1	Lineal Ft. of Shoreline Restored: 854	Cu. Yds. Debris Removed: 600
Riparian/Upland Acreage Restored: 3.78	Other:	
<b>Mill Pond (43.390389 / -86.356386)</b>		

Wetland/Aquatic Acreage Restored: 3.8	Lineal Ft. of Shoreline Restored: 977	Cu. Yds. Debris Removed: 2762
Riparian/Upland Acreage Restored: 1.4	Other:	
<b>TOTAL</b>		
Wetland/Aquatic Acreage Restored: 38.16	Lineal Ft. of Shoreline Restored: 8007	Cu. Yds. Debris Removed: 51851
Riparian/Upland Acreage Restored: 14.87	Other: 497 lineal feet of sheet-pile seawall removed	

### Project Relevance to the Great Lakes

This project is relevant to the overall restoration of the Great Lakes meeting each of the criteria and principles of the Great Lakes Restoration Initiative. It was supported by a scientific foundation (the White Lake Shoreline Habitat Restoration Plan) for habitat restoration needs in order to achieve strategic and measurable environmental outcomes based on the highest priorities for White Lake and the Great Lakes. The habitat restoration in this project was an acknowledged priority of the White Lake Remedial Action Plan and as such also advanced the ecological priorities of numerous state, regional and federal strategic Great Lakes AOC planning efforts; as well as efforts that will enable delisting, including Remedial Action Plans for Areas of Concern, the Lake Michigan Lakewide Management Plan, Michigan's GLRI 2010 Strategic Framework, the Great Lakes Regional Collaboration Strategy, and Michigan's Great Lakes Plan.

The work completed as part of this project will also promote long-term societal, economic, and sustainability goals for the White Lake Area of Concern by increasing fish and wildlife populations and improving aesthetics, which are key to the area's recreational and tourist economy. This initiative has also secured substantial public support through information and outreach efforts that took place as part of the project

### Education and Outreach Plan

An integral element of the White Lake Area of Concern Habitat Restoration Project was a comprehensive education and outreach strategy designed to ensure widespread public awareness of the restoration effort and its goal, delisting the two habitat-related Beneficial Use Impairments. To accomplish this, the Council, along with project partners and local stakeholders, promoted the initiative from beginning to end by implementing the following objectives:

- Hosting a ceremonial kickoff;
- Creating and disseminating a project display;
- Developing and distributing a project brochure;
- Sponsoring 3 public information/education meetings;
- Utilizing a project web site;
- Developing an e-newsletter and Facebook site;
- Providing 5 site tours;
- Coordinating 2 volunteer planting events; and
- Generating 5 press releases that led to multiple local media articles.

Key to the evaluation of the education and outreach plan was the development of a pre- and post-project survey. Overall, the final survey results (**attached**) indicate that education and outreach methods were appropriate to the White Lake area audience and increased local knowledge of fish and wildlife habitat issues. This also helped to provide for a significant increase in overall familiarity with the project and the

organizations involved, such as the Muskegon Conservation District and White Lake Public Advisory Council. In addition, the survey indicates that changes in behavior (use of native landscaping, removal of invasive species) have also occurred which may prove beneficial to White Lake's shoreline habitat. Some challenges remain. Negative viewpoints have been expressed regarding the changes made at one of the habitat restoration sites, the city of Whitehall's Svensson Park. These viewpoints may change as the City moves forward to implement further plans for the park, such as adding pathways, new play equipment, and picnic and viewing areas. It will also be important to continue education regarding the habitat restoration sites, to ensure the public is aware that up to five years may be necessary for the sites to be fully completed. The results of this final survey also indicate that ongoing education is necessary to ensure greater public knowledge of shoreline practices and their relationship to fishery and wildlife health.

### **Evidence of Ecological Restoration**

This project builds upon nearly two decades of scientific studies, research, assessments, planning and design work, as well as large-scale remediation and pollution control efforts in White Lake and the adjoining watershed. This project has implemented and will utilize a comprehensive long-term strategy to evaluate habitat restoration success in the White Lake Area of Concern through coordinating efforts with Bird Studies Canada's Marsh Monitoring Program. Bird Studies Canada has completed an initial report for the project generated through pre- and post-construction data (**attached**). The analysis employed a two-tiered approach to ensure that the habitat restorations have been effective and met the requirements for delisting of the two habitat related Beneficial Use Impairments. The first tier analysis utilized an Index of Biotic Integrity approach to rank the health of the site restorations as they relate to the biological health of the entire White Lake Area of Concern. To evaluate restoration of White Lake habitat as a whole, the second tier evaluated data, pre- and post-construction, for the entire Area of Concern, and compared it to similar sites throughout the region. The ongoing use of Marsh Monitoring Program data will be integral to monitor the long-term habitat restoration success, as this project will build upon 2006 monitoring and reporting by Bird Studies Canada on impairments for marsh habitats in the U.S. and binational Areas of Concern. The Muskegon Conservation District is currently seeking funding to implement long-term monitoring of project sites and track ongoing ecological recovery from restoration over the next 3-5 years.

### **Outcomes, Outputs, and Expected Results:**

Expected outcomes for the White Lake AOC Habitat Restoration Initiative for BUI Delisting include restoration and protection of wetland and wetland-associated uplands and aquatic and terrestrial habitats in the White Lake Area of Concern. The expected output from this project was overall improvement, protection, and restoration of aquatic, shoreline, and terrestrial habitat in a Great Lakes Area of Concern - White Lake; which it fully met. The project produced quantitative outcomes in the White Lake Area of Concern: job creation and improvement of the local economy, increased/ improved fish and wildlife habitat, removal of two of the Area of Concern's Beneficial Use Impairments, and increased community awareness. .

### **Job Creation and Improvement of the Local Economy**

The District continues to collect data from contractors regarding job creation from indirect monies; however the project created three new jobs and aided in retaining thirteen additional jobs (*based on direct project salary hours and federal business activity codes; not estimating indirect monies from grant funds allocated to business activity, i.e., material costs*), benefitting Muskegon County, which was experiencing a 16.9% unemployment rate and continued significant industrial losses due to the current recession. The long-term outcomes related to economics will be even greater with increased local business opportunities, improved ecosystem services for the community, and enhanced natural resource recreational opportunities that support tourism – a key business sector within the White Lake community. The greatest long-term socioeconomic benefit to accrue from this project will be the removal of the Area of Concern designation

for White Lake in 2013, eliminating a long-standing stigma that inhibits residential, industrial, and commercial growth. Further, according to a Brookings Institute report published in 2007 (*Healthy Waters, Strong Economy*), removal of the Areas of Concern designation will lead to increased property values.

### **Increased Fish and Wildlife Habitat**

The project encompassed restoration of shoreline, wetland, and habitat corridors at tens sites surrounding White Lake, resulting in 8,007 lineal feet of shoreline being restored, 38.16 acres of wetlands and aquatic habitat created/restored, 14.87 acres of riparian and upland habitat corridors were reconnected and restored, and 51,851 cubic yards of shoreline/marine debris were removed. These outcomes exceeded original estimates and goals for the project (restoration of 5,158 lineal feet of shoreline, creation of 35 acres of wetlands and aquatic habitat, reconnection and restoration of eight acres of riparian and upland habitat corridors, and removal of 27,134 cubic yards of shoreline / marine debris).

Throughout the project the greatest difficulty in ongoing success was in obtaining permits through the USACE. This process took significantly longer than expected even though initial project concepts were submitted through the standardized permit application process prior to initial submission of the GLRI proposal. Contradictory to these downfalls the District had significant success in reducing per site costs and expedited on the ground construction through the use of local contractors. Significant staffing by the District to undertake smaller components of restoration activities (exotic species control / removal) and continued on-site management also expedited work and limited cost overruns; both successful strategies which allowed for additional sites to be added to the overall scope of the project.

### **Removal of Two of the White Lake Area of Concern's Beneficial Use Impairments**

Successful completion of this project will achieve targets for removing the *Loss of Fish and Wildlife Habitat* Beneficial Use Impairment and delist the *Degraded Fish and Wildlife Populations* Beneficial Use Impairment with finalization of associated population surveys. Current research focused on delisting the fisheries related portions of the BUIs was conducted by Grand Valley State University Annis Water Resources Institute and was completed. The research demonstrated that fisheries habitat in White Lake is meeting delisting targets. Following final spring maintenance of habitat sites in 2013, and establishment of monitoring for habitat restoration sites, the District and Council will begin the documentation process for removal of the both fish and wildlife related BUIs.

### **Increased Community Awareness**

This project complements a 19-year effort to expand community awareness of the environmental factors that caused White Lake to be designated an Area of Concern in the mid-1980s. Because many of the historical problems that led to the designation stemmed from lack of public awareness, the Council (working with the District) has made education and public outreach a key priority for all of its programs. Interest in shoreline habitat restoration and water quality has also led to the City of Whitehall submitting and receiving funding for a companion proposal to this initiative. That City's project installed a "green street" along a key shoreline corridor that will directly benefit ongoing economic development, improve water quality, and ties directly to habitat restoration work in the area.

Lastly, this project also spurred additional funding from the National Oceanic and Atmospheric Administration to acquire key habitat parcels adjacent to the several of the habitat restoration sites. That project is ongoing.

### **Applicable Overarching Plans**

This initiative was part of the following plans that provide for protection and restoration of important Great Lakes placed-based efforts:

- The Lake Michigan Lakewide Area Management Plan: White Lake is a designated Area of Concern in Lake Michigan and its restoration and delisting is called for in this plan.
- Great Lakes Remedial Action Plans: White Lake is a Great Lakes Area of Concern, qualifying for the development and implementation of a Remedial Action Plan to address the removal of Beneficial Use Impairments.
- Michigan's Area of Concern Delisting Strategy: The habitat restoration activities encompassed in this initiative are priorities for the state's delisting strategy.
- White Community Action Plan (2005 Remedial Action Plan Update): White Lake as a designated Area of Concern and has eight related Beneficial Use Impairments, with developed targets and goals. Fish and Wildlife BUI goals have been established through scientific analyses and development of the White Lake Shoreline Management Plan.

### **Budget**

*Completed and filed with ASAP.gov office in Las Vegas. All project funds expended and applicable match documented. District continues to receive in-kind match from project partners and will integrate within District documentation as reference.*

### **Attachments**

- Outreach and Education – Final Survey Report
- Bird Studies Canada – Initial Project Evaluation
- Photo Documentation of Restoration Site Work (*Will be mailed to EPA Project Officer due to size of high resolution photo files*).