GREAT LAKES RESTORATION

Celebrating our Accomplishments
Celebrating the Future in Southeast Michigan

October 18, 2013
The Henry Ford

Rouge River ~ Detroit River ~ Clinton River ~ River Raisin ~ St. Clair River ~ Huron River ~

GREAT LAKES RESTORATION
October 18, 2013
The Henry Ford

Hosted by:

Alliance of Rouge Communities
OURS TO PROTECT
Working together, restoring the river

Cover photos:

Top row from left to right: The Clinton River in Rochester Hills, the St. Clair River looking at the Huron Light Ship at Pine Grove Park in Port Huron and the Huron River at the Hudson Mills Metropark in Dexter (photo credit: Huron River Watershed Council).

Bottom row from left to right: The Rouge River at the Lower Rouge Trail in Canton, the Detroit River in Detroit and the River Raisin in Monroe.

Additional copies of this document can be downloaded from the Alliance of Rouge Communities website at: www.allianceofrougecommunities.com

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Great Lakes Restoration

Celebrating the Accomplishments and Looking to the Future in Southeast Michigan

Southeast Michigan is home to a diverse group of organizations that have proactively restored the river ecosystems around which they live and work. Five areas - the Rouge River, the Detroit River, the Clinton River, the River Raisin, and the St. Clair River are designated as Areas of Concern (AOC) because of their history of contamination. The restoration of these historically contaminated areas, as well as the region in general, have been led by numerous watershed groups, such as the Huron River Watershed Council, the Clinton River Watershed Council, Friends of the Rouge, the Alliance of Rouge Communities, various Public Advisory Councils (PACs) and stakeholders such as Macomb County, Wayne County, the City of Detroit, the Great Lakes Commission and SEMCOG.

This book celebrates the remarkable restoration accomplishments that have occurred in the river systems of Southeast Michigan over the past few years and renews our commitment to continuing such efforts into the future. In the pages of this book, these watershed groups and other stakeholders will share information on the variety of ecological restoration efforts that have been completed or are being completed. These stories will emphasize some of the larger-scale Great Lakes Restoration Initiative (GLRI) projects funded through the U.S. Environmental Protection Agency, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Forest Service and others.

Partners in this endeavor include:

- City of Monroe Commission on the Environment for the River Raisin AOC
- Michigan Office of the Great Lakes
- Alliance of Rouge Communities
- Rouge River National Wet Weather Demonstration Project
- Rouge River Advisory Council
- Clinton River Watershed Council
- Huron River Watershed Council
- Southeast Michigan Council of Governments
- National Oceanic and Atmospheric Administration
- Great Lakes Restoration Initiative
- Friends of the Detroit River
- Detroit River Public Advisory Council
- Alliance of Downriver Watersheds
- The Nature Conservancy
- Friends of the Rouge
- River Raisin Partnership
- The Stewardship Network
- St. Clair River Bi-National Public Advisory Council
- Legacy Land Conservancy
- Lenawee Conservation District
- United States Geological Service
- Wayne County Department of Public Services
- Great Lakes Commission

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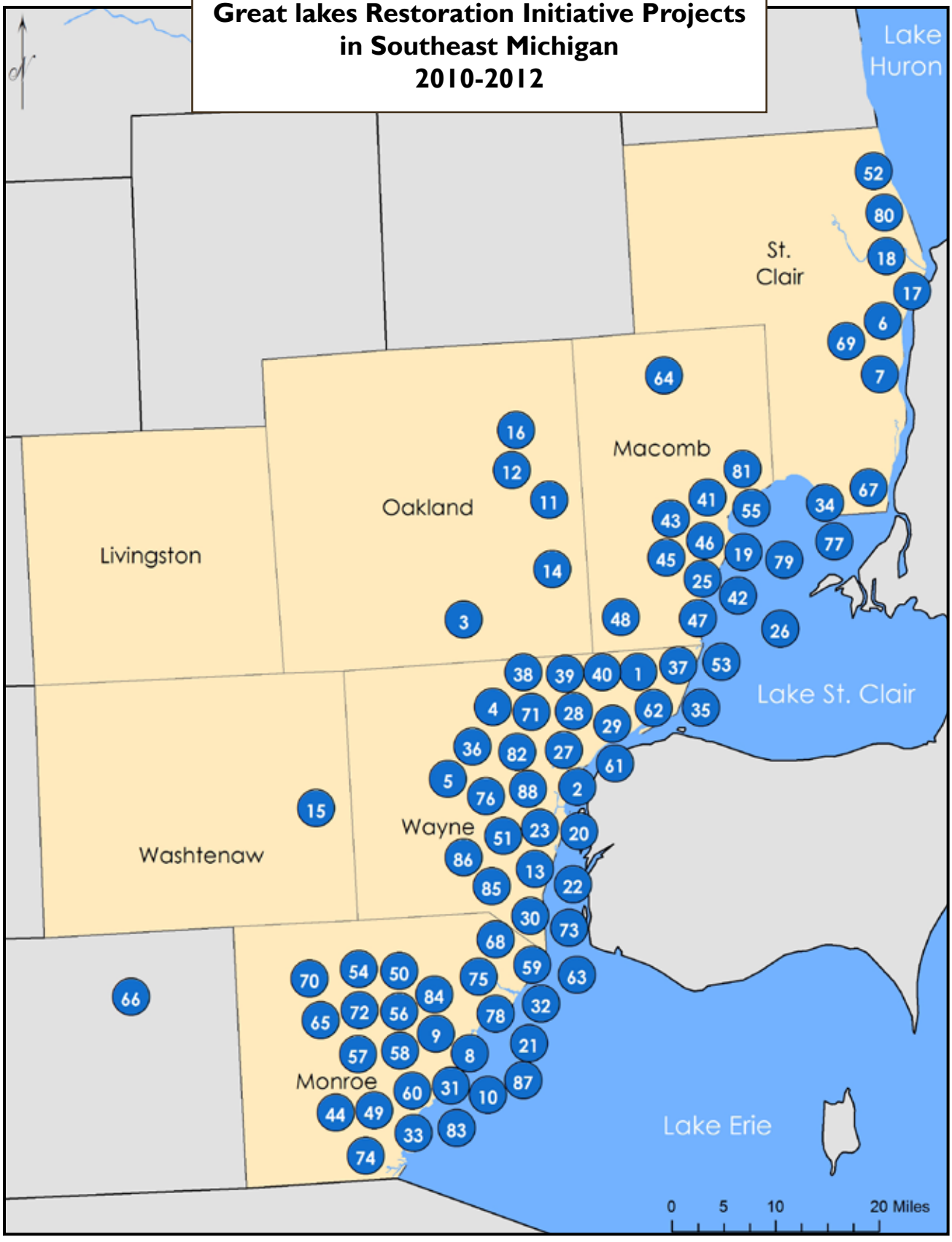


NOTE: This map, along with the table on page 4 and 5, reflects projects from just the first three years of the GLRI – 2010, 2011 and 2012. It also reflects primarily on-the-ground projects or projects with a site-specific element. There are additional projects, not included, that focus on capacity/program management for state agencies, monitoring, research, public education, etc. These are important projects, but don't lend themselves to a "point on a map." Also, the points are approximate and may reflect the location of the project or the location of the implementing agency or organization. Finally, in some cases a single "project" may include multiple sites but the map includes just a single point for each project.

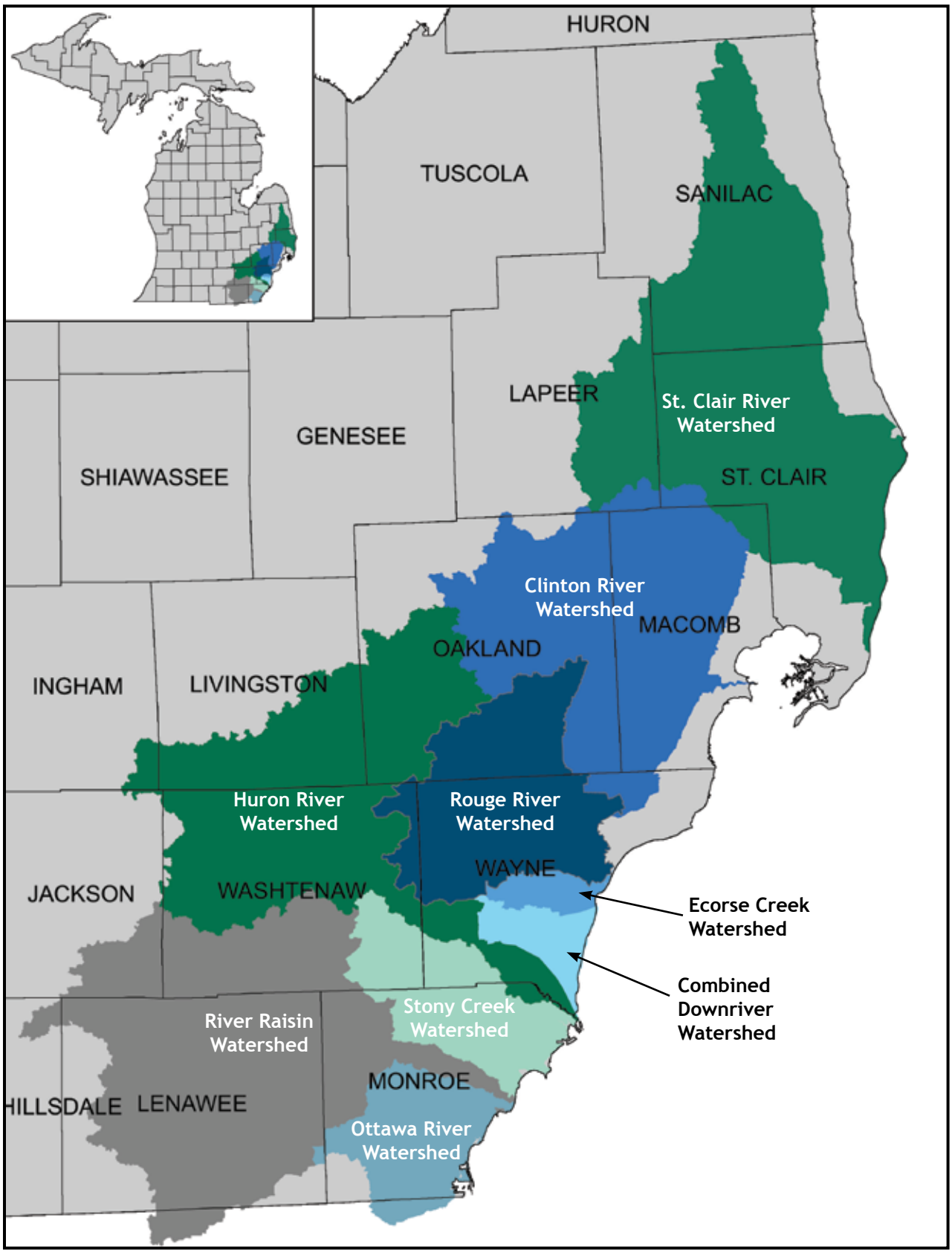
Map Number Key for Great Lakes Restoration Initiative Projects in Southeast Michigan 2010-2012

Map Number	Project Title	Recipient Org. or Lead Agency	GLRI Award	Fiscal Year	Funding Agency
1	Marine Debris Removal and Prevention on Belle Isle	Alliance for the Great Lakes	$50,000	2012	NOAA
2	Restoring Community Trees in Urban Watershed	Alliance of Rouge Communities	$374,980	2011	USFS
3	Danvers Pond Dam Removal and Stream Restoration	Alliance of Rouge Communities	$499,254	2010	U.S. EPA
4	Transforming the Rouge AOC from Mowed Down to Grown Up	Alliance of Rouge Communities	$648,750	2010	U.S. EPA
5	Wayne Road Dam Removal and Habitat Improvement	Alliance of Rouge Communities	$1,000,000	2011	NOAA
6	St. Clair River AOC Living Shorelines Project	City of Marysville	$1,500,000	2010	U.S. EPA
7	Chrysler Beach Stormwater Improvements	City of Marysville	$500,000	2012	U.S. EPA
8	Restoring Lake Erie Fish Passage, River Raisin AOC	City of Monroe	$1,266,400	2010	U.S. EPA
9	Installation of Fish Passage Structures at Four Dams Along the River Raisin in Michigan	City of Monroe	$200,000	2012	U.S. EPA
10	St. Clair River AOC - Habitat and Wildlife Restoration	City of Port Huron	$1,296,700	2010	U.S. EPA
11	Avon Creek Restoration	City of Rochester Hills	$192,857	2010	USFWS
12	Paint Creek Restoration Project	City of Rochester	$750,000	2012	Sustain Our Great Lakes
13	Elias Cove Fish Habitat Native Plantings	City of Trenton	$14,286	2010	USFWS
14	Restoring Fish Passage in the Red Run Headwaters	City of Troy	$985,000	2012	NOAA
15	Water Street: Phytoremediation and Reforestation Initiative	City of Ypsilanti	$159,682	2010	USFS
16	Clinton River AOC: Paint Creek Dam Removal	Clinton River Watershed Council	$706,588	2010	U.S. EPA
17	Upper St. Clair River Shoreline Habitat Restoration Projects	Community Foundation of St. Clair County	$250,000	2011	USFWS
18	Upper St. Clair River Habitat Restoration	Community Foundation of St. Clair County	$2,000,000	2012	USFWS
19	Eliminating E. Coli Sources Impacting Beach Closures	County of Macomb	$254,406	2011	U.S. EPA
20	Develop & Implement a closure plan for the Grassy Island Unit of the Detroit River	Dept. of Int.-U.S. Fish and Wildlife Service	$149,700	2011	USFWS
21	Restoration of the Common Tern Population in the Detroit River International Wildlife Refuge	Dept. of Int.-U.S. Fish and Wildlife Service	$55,000	2010	USFWS
22	Early Warning Program to Detect and Identify Contaminants of Emerging Concern	Dept. of Int.-U.S. Fish and Wildlife Service	$10,290	2012	USFWS
23	Investigate & Plan Remedy for Grassy Island, Detroit River	Dept. of Int.-U.S. Fish and Wildlife Service MN	$2,800,000	2010	USFWS
24	Fish Habitat Enhancement Strategies for the Huron-Erie Corridor	Dept. of Interior-U.S. Geological Survey MI	$2,300,000	2010, 2011	USGS
25	Nowcast models for beach closure predictions at Metro Beach, Mount Clemens and Memorial Beach in St. Clair Shores	Dept. of Interior-U.S. Geological Survey MI	$2,250,000	2010, 2011, 2012	USGS
26	Fish Habitat Enhancement Strategies for the Huron-Erie Corridor	Dept. of Interior-U.S. Geological Survey MI	$3,100,000	2010, 2011, 2012	USGS
27	Fordson Island Oxbow Restoration and Debris Removal Program	Detroit Wayne County Port Authority	$144,377	2010	NOAA
28	Greening of Detroit	Detroit's Dendroremediation Model Project	$473,020	2011	USFS
29	Forest Restoration at Detroit Refuge Gateway	Downriver Community Conference	$113,700	2011	USFS
30	Coastal Restoration at the Refuge Gateway and Humbug Marsh	Downriver Community Conference	$500,000	2011	Sustain our Great Lakes
31	Ford Marsh Coastal Wetland Enhancement	Ducks Unlimited	$335,658	2012	NOAA
32	Pointe Aux Peaux Coastal Wetland Restoration and Fish Passage	Ducks Unlimited, Inc.	$192,653	2010	U.S. EPA
33	Dusseau Wetland & Lakeplain Prairie Restoration, Erie, MI	Ducks Unlimited, Inc.	$284,477	2010	U.S. EPA
34	Anchor Bay/St. Clair Flats Phragmites Control and Education	Ducks Unlimited, Inc.	$974,037	2010	U.S. EPA
35	Detroit River AOC Habitat Enhancement - South Fishing Pier	Friends of the Detroit River	$497,634	2010	U.S. EPA
36	Detroit River AOC Habitat Restoration - US Steel Site	Friends of the Detroit River	$1,200,000	2010	U.S. EPA
37	Detroit River AOC Habitat Restoration - Blue Heron Lagoon	Friends of the Detroit River	$1,428,994	2010	U.S. EPA
38	Planning and Beginning Reforesting of Detroit Using Strategic Ecological and Environmental Analysis	Greening of Detroit	$320,000	2010	USFS
39	Detroit's Dendroremediation Model Project	Greening of Detroit	$500,000	2010	USFS
40	Emerald Ash Borer Reforestation Initiative	Greening of Detroit	$750,000	2010, 2012	USFS
41	Reducing the Impact of Stormwater on Metro Beach	Huron Clinton Metropark Authority	$1,000,000	2011	U.S. EPA
42	Reducing the Impact of Stormwater at Lake St. Clair Metropark (Metro Beach)	Huron-Clinton Metropolitan Authority	$1,500,000	2011, 2012	U.S. EPA
43	Black Creek Marsh	Huron-Clinton Metropolitan Authority	$221,000	2012	NOAA
44	Upper River Raisin Riparian Protection Program	Legacy Land Conservancy - MI	$103,954	2012	NRCS

Map Number Key for Great Lakes Restoration Initiative Projects in Southeast Michigan 2010-2012

Map Number	Project Title	Recipient Org. or Lead Agency	GLRI Award	Fiscal Year	Funding Agency
45	Clinton River Spillway and Fish Habitat Restoration	Macomb County	$350,000	2011	NOAA
46	Clinton River AOC - Lake St. Clair Coastal Marshland Restoration	Macomb Co. Dept. of Planning & Economic Dev.	$1,492,500	2010	U.S. EPA
47	Household Hazardous Waste Great Lakes Shoreline Collection	Macomb County Health Department	$250,000	2010	U.S. EPA
48	Illicit Discharge Elimination Program Facility Dye Testing	Macomb County Health Department	$250,000	2010	U.S. EPA
49	Reducing Sediment and Nutrients Entering the Western Lake Erie Basin	Michigan Department of Agriculture	$265,980	2012	U.S. EPA
50	Targeted Efforts for Reducing Sedimentation in the River Raisin Watershed Using BMP Auctions	MI Depart. of Agriculture and Rural Development	$438,033	2010	
51	Grassy Island Disposal Facility	MDEQ	$47,000	2010	USFWS
52	Michigan Beaches-St. Clair County Health Department	MDEQ	$162,874	2010	U.S. EPA
53	Michigan-Expanded Lake St. Clair-Erie Beach Testing-Source Tracking	MDEQ	$171,025	2010	U.S. EPA
54	The River Raisin Nitrate TMDL Reduction Project	MDEQ	$741,857	2010	U.S. EPA
55	Black Creek Sedimentation and Phosphorus Reductions	MDEQ	$947,000	2010	U.S. EPA
56	River Raisin Wetland Enhancement and Habitat Evaluation	MDNR	$1,350,000	2010	U.S. EPA
57	William C. Sterling State Park Marsh and Prairie Restoration	MDNR	$1,500,000	2010	U.S. EPA
58	River Raisin Area of Concern	MDNR	$570,000	2012	U.S. EPA
59	Pointe Mouillee Coastal Wetland Restoration & Dike Rehabilitation	MDNR	$489,838	2010	USFWS
60	Nutrient Reduction in the River Raisin and Lake Erie	MDEQ	$350,000	2012	U.S. EPA
61	Restoring Native Fish SPawning Habitat in the St. Clair River Delta in the St Clair River Area of Concern	Michigan Sea Grant	$890,232	2010	NOAA
62	Restoring Fish Spawning Habitat in the Detroit River	Michigan Sea Grant	$799,226	2012	Sustain Our Great Lakes
63	Green Marina Education and Outreach Project	Michigan Sea Grant/University of Michigan	$558,610	2010, 2011	U.S. EPA
64	Developing TMDL Implementation Plan for Coon Creek	Michigan State University	$202,628	2010	U.S. EPA
65	Conservation Treatment on 2.8 acres of working lands in the Ottawa-Stony watershed	Natural Resource Conservation Service (1 landowner contract)	$1,540	2011	NRCS
66	Conservation Treatment on 2389.9 acres of working lands in the Raisin watershed	Natural Resource Conservation Service (18 landowner contracts)	$1,159,470	2011	NRCS
67	Lake St. Clair Partners are Ready to Implement	Southeast Michigan Council of Governments	$279,806	2010	U.S. EPA
68	Restoring the Lake Erie Corridor through Green Streets	Southeast Michigan Council of Governments	$500,000	2010	U.S. EPA
69	Howe-Brandymore Stream Restoration Project	St. Clair County Drain Commissioner	$121,429	2010	USFWS
70	Community Collaboration to Protect Important Wetland Habitat	Stewardship Network	$124,840	2011	Sustain our Great Lakes
71	Detroit's EAB Reforestation Initiative	The Greening of Detroit	$500,000	2010	USFS
72	Oak Openings Inter-Agency Restoration Team (OH & MI)	The Nature Conservancy	$434,594	2011	Sustain our Great Lakes
73	Detroit River-Western Lake Erie CWMA and Phragmites Control	The Nature Conservancy	$534,689	2011	U.S. EPA
74	Erie Marsh Preserve Coastal Wetland Restoration	The Nature Conservancy	$2,581,696	2010	NOAA
75	Estral Beach, MI	U.S. Army Corps of Engineers	$50,000	2010	USACE
76	Upper Rouge River Restoration, MI (1135)	U.S. Army Corps of Engineers	$50,000	2011	USACE
77	St. Clair River & Lake, St. Clair, MI	U.S. Army Corps of Engineers	$135,000	2011	USACE
78	Monroe Harbor, Raisin River, Monroe, MI	U.S. Army Corps of Engineers	$150,000	2010, 2011	USACE
79	Clinton River/Anchor Bay	U.S. Army Corps of Engineers	$400,000	2010, 2011	USACE
80	CAP 206 - Doe Creek Restoration, MI	U.S. Army Corps of Engineers	$25,000	2012	USACE
81	GLFER - Salt River Marsh Coastal Habitat Restoration	U.S. Army Corps of Engineers	$75,000	2012	USACE
82	GLFER - Ford Estate Dam Fish Passage, MI	U.S. Army Corps of Engineers	$200,000	2012	USACE
83	"Strategic" Navigation Dredging - River Raisin Strategic Navigation Dredging	U.S. Army Corps of Engineers	$1,181,900	2010, 2011, 2012	USACE
84	River Raisin AOC Great Lakes Legacy Act Contaminated Sediment Remediation	USEPA-Great Lakes Legacy Act & State of MI	$5,600,000	2012	U.S. EPA and MI
85	Detroit River Area of Concern-Trenton Channel Contaminated Sediment Remedial Investigation and Feasibility Study	USEPA-Great Lakes Legacy Act and BASF Corp. and Arkema Corp.	$200,000	2010	U.S. EPA
86	Rouge River AOC Contaminated Sediment Site Characterization	USEPA-Great Lakes Legacy Act & State of MI	$50,000	2010	U.S. EPA
87	River Raisin AOC Contaminated Sediment Site Characterization	USEPA-Great Lakes Legacy Act & State of MI	$60,000	2010	U.S. EPA
88	Toxics Reduction within the Rouge & Detroit River AOCs	Wayne County - Dept. of Public Services	$500,000	2011	U.S. EPA

Southeast Michigan Watersheds



Alliance of Rouge Communities

The Alliance of Rouge Communities (ARC), is a non-profit voluntary public watershed entity currently comprised of 34 municipal governments (i.e. cities, townships and villages), three counties (Wayne, Oakland and Washtenaw), Henry Ford Community College, University of Michigan-Dearborn, the Wayne County Airport Authority and the following Cooperating Partners: Friends of the Rouge, Cranbrook Institute of Science, Wayne State University, Southeastern Oakland County Water Authority, Rouge River Advisory Council and The Henry Ford.

The purpose of the ARC is to provide an institutional mechanism to encourage watershed-wide cooperation and mutual support to meet water quality permit requirements and to restore beneficial uses of the Rouge River to the area residents.

Founded in 2005, the ARC is funded by membership dues from local governments and supported by grants. The ARC and its partners work cooperatively to meet water quality requirements mandated by the state's storm water permit and to restore beneficial uses to the Rouge River such as canoeing, fishing and other recreational activities.

The ARC has received more than $3 million in federal and state grants to create habitat, improve fish passage, restore tree canopy and monitor water quality improvements. Another $2.8 million has been received by ARC members from the Rouge River National Wet Weather Demonstration Project to fund projects for stream bank restoration, green infrastructure, educational activities, recreational enhancements and infrastructure improvements to prevent sewage from going into the river.

Other activities conducted by the ARC include:

- **Permit Compliance Activities:** Water quality monitoring which helps gauge the health of the river.
- **Public Education:** More than 3,000 rain barrels have been sold by the ARC to residents to promote the re-use of storm water. More than 100 trees have been planted by Rouge River Watershed public and private schools participating in the Green Schools Program. Thousands of tree seedlings have been distributed to schools and to residents at community events. More than 2,000 trees have been planted in ARC communities to replace trees lost to the Emerald Ask Borer.
- **Elimination of Pollutant Sources:** The ARC and the Counties coordinate Illicit Discharge Elimination efforts that have successfully eliminated millions of gallons of sewage from the Rouge River.
- **Green Infrastructure:** A campaign that installs native plant grow zones in ARC member communities and institutions, such as schools. To date 30 grow zones have been installed in the watershed.

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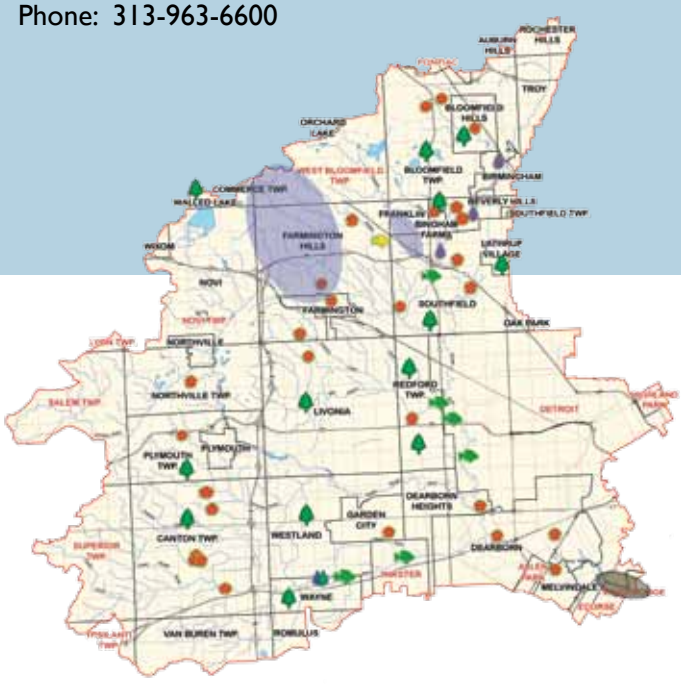


Danvers Pond Dam Removal and Stream Restoration

Farmington Hills, MI

FUNDING SOURCE: Rouge River National Wet Weather Demonstration Project (Rouge Project), Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: City of Farmington Hills, Alliance of Rouge Communities

BUDGET: $531,000, $32,000 match

START/END DATE: 2008 - 2012

The Danvers Pond Dam Removal and Stream Restoration Project is located on city-owned property at Pebble Creek, a tributary of the Main Rouge River. This project consisted of the finalization of the design and construction contract documents, permitting, and construction of the Danvers Pond Dam removal, the construction of a naturalized water course and restoration of the floodplain. Prior to implementation of the project, the dam acted as a barrier to fish passage as well as promoted the accumulation of sediment within the pond, which contributed to the degradation of the creek.

The goals of the project were to create and improve habitat and increase water quality in the creek while making progress toward eliminating the Benthos and Fish and Wildlife Habitat Beneficial Use Impairments (BUIs) for the Rouge River Area of Concern (AOC). The project also aimed to fulfill local and subwatershed goals by improving the quality of the ecosystem and restoring approximately two acres of habitat for fish and terrestrial wildlife.

With the removal of the dam, two acres of woodland and wetland habitat were restored and preserved, and 283 linear feet of naturalized stream channel was created which improved habitat conditions for fish and wildlife using the Pebble Creek stream corridor. Additionally, the removal of the dam and the enhancements to Pebble Creek now allows unencumbered fish passage for Pebble Creek, which is approximately 6.5 miles, and creates a natural buffer of native vegetation between developed private property and the stream corridor.

Wayne Road Dam Removal and Habitat Improvement

Wayne, MI

FUNDING SOURCE: Rouge River National Wet Weather Demonstration Project (Rouge Project) and National Oceanic and Atmospheric Administration (NOAA)

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities

BUDGET: $1.03 million, $50,857 match provided by ARC and $6,693 match provided by Environmental Consulting & Technology, Inc.

START/END DATE: 2010 - 2013

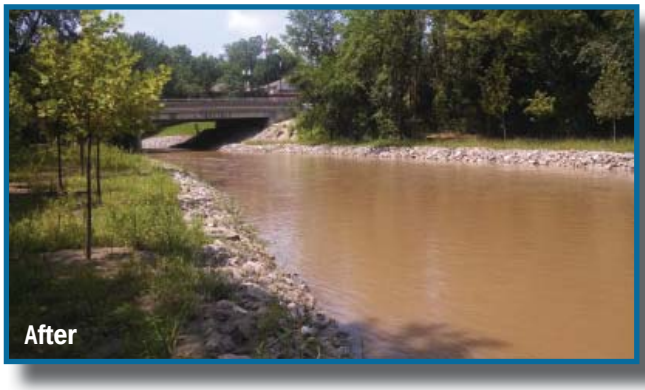
The Wayne Road Dam, which was owned by Wayne County Parks, was located in the City of Wayne on the Lower Branch of the Rouge River which flows through Superior, Salem, Canton, Van Buren and Plymouth townships and the cities of Wayne, Westland, Romulus, Garden City, Inkster, Dearborn Heights and Dearborn before joining the Main Branch of the Rouge River. The river hosts a variety of fish in the vicinity of the dam, including trout in upstream areas and a variety of warm water species. (e.g., smallmouth bass, northern pike, walleye, sunfish) downstream of the dam. The dam removal provided fish passage which enhanced fish communities in the Lower Rouge River by reconnecting the Lower Rouge River to the Detroit River and Lake Erie ecosystem.

Prior to implementation of the project, the dam acted as a barrier to fish passage as well as promoted the accumulation of sediment and debris behind the dam, which contributed to the degradation of the reach of river. Removal of the Wayne Road Dam was a priority project for the Rouge River Advisory Council in order to implement the 2008 Delisting Targets for Fish and Wildlife Habitat and Population Beneficial Use Impairments for the Rouge River Area of Concern. The ARC proposed the project to aid in the advancement of the Rouge River AOC delisting efforts.

The implementation of the project has improved the riparian corridor and hydrologically reconnected approximately 123 miles of river and tributaries to the Great Lakes system for the first time in over a century. The river hosts a variety of fish species in the vicinity of the dam, including variety of warm water species (e.g., smallmouth bass, northern pike, walleye, suckers, darters, minnow, sunfishes). All of these species have been benefitted as a result of the implementation of this project. Rock structures and bank stabilization improved fish and wildlife habitat, benefiting key aquatic species and natural communities. Great Lakes aquatic and terrestrial habitats were restored and protecting by re-connecting the river to the Great Lakes system.

Under a Wayne County Rouge Program Office grant, the Engineering Design and State MDEQ Permit were completed in 2011. Construction and monitoring of the project was completed under a 2011 National Oceanic and Atmospheric Administration (NOAA) grant. The NOAA-funded project removed the dam and restored fish passage. In addition to the removal of the dam the project removed an in-stream island downstream of the dam and reconstructed a more stable single flow channel with bankfull benches, installed an engineered riffle/boulder cascade to protect existing infrastructure and facilitate fish passage, and provided for bank stabilization. Extensive public education with local communities and City of Wayne residents was also conducted by ARC Staff and Friends of the Rouge.


Before


After

Transforming the Rouge River Area of Concern from Mowed Down to Grown Up

Rouge River Watershed, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities

BUDGET: $648,750, $191,591 match provided by Wayne County, City of Southfield, ARC and the Erb Family Foundation

START/END DATE: October 2010 - June 2013

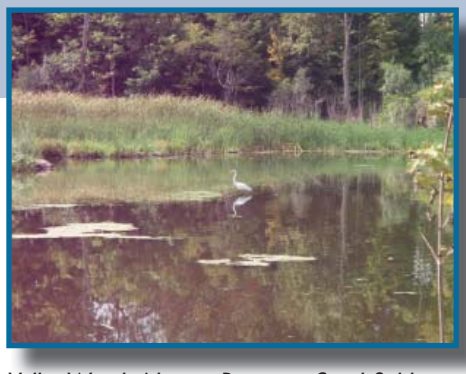
The goals of the Transforming the Rouge project were to create and improve habitat while making progress toward eliminating the Benthos and Fish and Wildlife Habitat Beneficial Use Impairments (BUIs) for the Rouge River Area of Concern (AOC).

The following activities were conducted during this project:

- Seven acres of wetlands at the Valley Woods Nature Preserve in Southfield were improved by removing invasive species, re-introducing plant diversity and restoring wetland hydrology.
- Controlled burns of mowed turf grass and prairie were conducted at 10 acres in Detroit's Eliza Howell and Rouge parks. They were both re-seeded with native plants.
- Fifteen acres of managed turf grass was converted to native plant grow zones along Wayne County's Lower Rouge Parkway (Venoy Road and Inkster Road locations and in Lola Valley Park (Redford Township).

This project included a public education component to educate the residents living around the grow zone areas and the Valley Woods Nature Preserve as well as pre and post- construction benthics macroinvertebrate sampling conducted by Friends of the Rouge and Wayne County.

This project has increased focus on the benefits of native areas and habitat. A Detroit Public Schools program by a local stewardship group expanded from two classrooms to 10 classrooms in Detroit's Rouge Park since the prairie was restored in 2012 and students visit the restored prairie throughout the school year to document seasonal changes. Wild turkeys and coyotes were observed in Rouge Park in 2012 and a Blue Heron rookery is thriving in Rouge Park. At the Valley Woods Wetlands in Southfield, increased wildlife usage - whitetail deer, great blue herons and coyotes - have been observed. Since the native areas were restored, there is an increase in butterflies in Detroit's Eliza Howell and Rouge parks and there are more butterfly and bird watching events at Eliza Howell Park. Sensitive stoneflies have been observed hatching in the channelized portion of the lower portion of the Rouge Main Branch, downstream of three of the Transforming the Rouge projects



Valley Woods Nature Preserve, Southfield

Black Swallowtail on butterfly milkweed in Rouge Park, Detroit

Wayne County's Lower Rouge Parkway

Rouge Oxbow Restoration Project Phase III

Dearborn, MI

FUNDING SOURCE: Rouge River National Wet Weather Demonstration Project (Rouge Project), State of Michigan Clean Michigan Initiative (CMI), National Oceanic and Atmospheric Administration (NOAA) and Ford Motor Company

ENTITY RECEIVING FUNDING: Rouge Project, The Henry Ford, Wayne County, Alliance of Rouge Communities

BUDGET: $3.7 million to date, $500,000 match

START/END DATE: 2002 - Ongoing

The Rouge Oxbow Restoration Project is located at The Henry Ford adjacent to the Rouge River in Dearborn, Michigan. The main objective of the Rouge Oxbow Restoration Project is to enhance the ecological viability of the oxbow channel while providing interpretive and educational opportunities.

The project has been completed in phases over the last 10 years. The initial work provided restoration of the Oxbow wetlands similar to riverine wetlands common in southeast Michigan rivers. The restoration provided a 2,200 ft. channel that varies in width from 15 to 50 feet and depths of three to six feet, with some deeper holes for fish habitat. The channel is surrounded by three acres of submergent and emergent wetland systems that provide habitat for various fish and aquatic species. Aquatic habitat was enhanced by appropriate placement of woody material and submergent plant species in and near deeper pool areas with plants. The wetland transitions to 10 acres of existing and proposed upland woodlands and open areas and planted with various native tree, shrub, grass and wildflower species. Plant species were chosen to reflect historic southern Michigan riverine wetland and floodplain systems, as well as including species that were utilized by the indigenous people (primarily Potowatomi and Chippewa) for food, medicinal and cultural materials.

As part of another phase the eastern end of the Oxbow was opened back up to the river and a current NOAA grant to the Alliance of Rouge Communities will start the process of providing the final open cut to the river. The past and proposed modifications to the riverbank include bioengineering techniques, riparian habitat creation, and slope stabilization. Of equal importance is the construction of appropriate hydraulic structures at the oxbow channel inlet and outlet that breach the existing earthen berm (behind the concrete-lined channel) and provide an open hydraulic connection that can withstand the high velocities associated with flood flows and will contain the 100-year storm. These "open cuts" restore a connection for benthic macro-invertebrates, amphibians, birds, fish and small mammals. Benefits to bass, channel catfish and bowfin will be provided by the development of the created lacustrine habitat

The Oxbow restoration has and will continue to provide a unique opportunity within The Henry Ford to provide passive recreational and educational opportunities. The structure of activities at The Henry Ford provides a forum for experiencing a variety of natural ecosystems. Passively, the restoration efforts can be viewed from the rail cars on the passenger railroad as well as from observation and trail areas on the upland area interpretive displays. Educational opportunities also exist with the close proximity of the Henry Ford Academy in the village. Students and educators may elect to participate in monitoring the growth and success of the restoration project.

Office of the Great Lakes

Michigan's Office of the Great Lakes (OGL) participates in policy development and implements programs to protect, restore and sustain our region's most precious natural resource. The office collaborates with diverse state, national and international partners to support sustainable use of these coastal resources, coordinate restoration of severely degraded areas, manage water quality and quantity, prevent aquatic invasive species and engage in emerging issues.

We are committed to our Great Lakes mission to ensure a healthy environment, strong economy and high quality of life. Our work is divided into three main program areas: the Areas of Concern Program, the Coastal Zone Management Program and the Great Lakes Coordination Program.

Areas of Concern Program – The Great Lakes Water Quality Agreement identifies 14 areas on or near Michigan's Great Lakes coast that possess serious water quality problems. Each Area of Concern (AOC) suffers from Beneficial Use Impairments such as fish consumption advisories, restrictions on dredging, wildlife habitat issues and others. OGL and local stakeholders have collaborated to create Remedial Action Plans to guide restoration efforts. Now, OGL, local Public Advisory Councils and federal partners are working together to implement these plans, systematically restoring beneficial uses and eventually de-listing these AOCs once and for all.

Coastal Zone Management Program – Michigan's Coastal Management Program was developed under the federal Coastal Zone Management Act. The program assists organizations in protecting and enhancing coastal areas, funds studies related to coastal management and helps to increase recreational opportunities in Michigan's Great Lakes coastal area. For example, the program has directed National Oceanic and Atmospheric Administration funding to projects to improve public access, restore historic areas, increase awareness of beach hazards, preserve unique habitat and more.

Great Lakes Coordination Program – The Great Lakes Coordination Program helps to manage the state's participation in the shared management of the Great Lakes. A primary duty of staff has been to assist in the development and implementation of Lakewide Action and Management Plans (LAMPs) for the lakes. The purpose of the LAMPs is to reduce loadings of critical pollutants and provide a strategy to protect and restore beneficial uses impacted in the waters of each Great Lake. The Program also coordinates between LAMP and domestic planning and implementation efforts to ensure actions are undertaken in a manner that support Michigan's Great Lakes protection and restoration priorities.

In addition to these programs, OGL staff also participate in inter-agency policy development on topics such as aquatic invasive species, water use and ballast water reporting. The office has also been involved in emerging issues including facilitating the 2012 Council of Great Lakes Governors summit on Mackinac Island and emergency dredging efforts due to low Great Lakes water levels. OGL represents the state of Michigan in a number of inter-state and international organizations that develop and implement policies to protect the Great Lakes, including the Great Lakes Compact. Each year, OGL releases a State of the Great Lakes report summarizing the most important issues facing the lakes in our state.

Jon Allan, Director
Office of the Great Lakes

Friends of the Rouge

Friends of the Rouge (FOTR) is a non-profit organization whose mission is to promote restoration and stewardship of the Rouge River ecosystem through education, citizen involvement and other collaborative efforts, for the purpose of improving the quality of life for the people, plants and animals of the watershed. The Rouge River Watershed is an Area of Concern located in metropolitan Detroit, Michigan. Founded in 1986, FOTR works to promote its mission through hands-on activities that engage the general public and students in restoring and monitoring the watershed.

FOTR accomplishes its mission through five major programs. Rouge Rescue is the flagship cleanup event held annually in the spring. Several thousand volunteers participate each year at 25-50 sites and remove tons of garbage and invasive plants as well as planting hundreds of native plants. The Rouge Education Project engages thousands of K-12 students in assessing the health of the river through water quality monitoring. River Restoration educates landowners in practices that improve water quality through workshops and hands-on planting days. The Benthic Macroinvertebrate Monitoring Program engages volunteers in collecting data on the health of the river to assess restoration progress. The Frog and Toad Survey engages local residents in calling surveys to connect them to local wetlands.

FOTR is a clearinghouse for information about the Rouge River, collaborates with other organizations on projects and research, promotes recreation on the river, etc. As the river has gotten cleaner, FOTR is in the initial stages of planning a Rouge River Water Trail.

FOTR is governed by a fifteen member board of directors elected by the membership. The staff consists of an operations director, three program managers and one assistant program manager. Part-time assistant positions are hired as funding allows. There are three regular office volunteers, several hundred members and thousands of volunteers. FOTR's offices are located on the University of Michigan-Dearborn campus.

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Fordson Island Oxbow Restoration and Marine Debris Removal

Dearborn, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI), National Oceanic and Atmospheric Administration (NOAA)

ENTITY RECEIVING FUNDING: Detroit Wayne County Port Authority (DWCPA)

BUDGET: $144,377 NOAA funds, match provided by DWCPA $14,760, FOTR $2,749, and AKT Peerless and other contractors $127,327

START/END DATE: June 2010 - September 2012

Fordson Island is a six acre island located in the industrialized Main Stem of the Rouge River, created in 1917 by straightening and channeling. The island and its oxbow contain some of the few remaining natural habitats in this portion of the Rouge River. Abandoned by residents in the late 1980s, the island and oxbow were left littered with over 20 abandoned boats and other marine debris.

Restoring Fordson Island was identified as a priority project in the 2008 Rouge River Area of Concern Delisting Targets for Fish and Wildlife Habitat and is a long term goal of the Gateway Project, a partnership of local industry and other institutions focused on this stretch of the river. Friends of the Rouge became interested in cleaning up the oxbow after organizing an annual kayak trip in 2007.

In 2009, FOTR partnered with the DWCPA and others to seek funding sources. The DWCPA was awarded NOAA's Community-based Marine Debris Removal Program for the project which was managed by its consultant AKT Peerless. This was the first project to be funded in the Great Lakes under this grant source. The goal of the project was to initiate the restoration of the onshore and offshore habitat through the removal of abandoned boats and debris from the oxbow channel and near-shore of Fordson Island.

The debris removal proved to be more difficult than expected. The project was delayed due to winter weather and an additional permit that was not expected. The removal finally began in May 2011. It was a complex operation with a marine hauling company onshore and an emergency response boat in the water ready to respond in case of spills. In total, 122 metric tons of debris (including 21 boats) and 365 cubic yards of small shoreline debris were removed, cleaning up over 500 feet of native shoreline. Abandoned fuel tanks were found in two boats, which were contained and removed. Four volunteer cleanup days were held with over 100 volunteers assisting in removing more debris and two additional boats onshore.

To monitor the success of the project, benthic macroinvertebrate, photo and fish surveys were conducted before and after. Benthic macroinvertebrate scores increased following the cleanup. The number of species of fish as well as the total number increased following the cleanup. One of the target species not seen on the initial survey was found on the follow-up fish survey: a northern pike. Benthic macroinvertebrate monitoring will continue through Friends of the Rouge's Benthic Macroinvertebrate Monitoring Program.

The project is part of a larger vision of a natural island in the midst of an industrial area that will be used for passive recreation. This was the first completed project for the Great Lakes Region with that program.

Wayne Road Dam Removal and Habitat Improvement, Outreach and Education

Wayne, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI), National Oceanic and Atmospheric Administration (NOAA), Rouge River National Wet Weather Demonstration Project (Rouge Project)

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities (ARC)

BUDGET: $1.03 million, FOTR portion of budget was $10,000, $50,857 match provided by ARC

START/END DATE: November 2010 - July 2013

The Wayne Road Dam, located in the City of Wayne on the Lower Branch of the Rouge River, was removed through a NOAA GLRI grant in 2012 to restore fish passage and reconnect 17 miles of the Lower Rouge River to Lake Erie. Friends of the Rouge provided the Outreach and Education for the grant and focused on paddling to connect the community to the river.

Because this project would remove the only major impediment to paddling on the entire Lower Branch, FOTR decided to explore the potential for paddling from Canton Township, upstream of the dam, to the confluence of the Lower with the Main Branch in Dearborn - a total of 19.17 miles. The Lower Branch of the Rouge River is the only one of its four branches that has consistently high enough water levels to make paddling a realistic possibility, mainly due to the discharge of treated water from the Ypsilanti Wastewater Treatment Plant.

The 19.17 mile route was difficult due to the large number of fallen trees blocking the river. FOTR recruited six seasoned, experienced canoeists who had already been working on opening a route in Wayne. One of the expeditioners was also a reporter who publicized the trip before and after and gave Facebook updates as the trip progressed. The Canoe Expedition was held on October 7-9, 2011. The group encountered 171 logjams large enough to have to exit their boats to get around, lots of wildlife, and a beautiful river with great hidden potential.

Following the Expedition, a Logjam Opening Class was held for municipalities along the route and other interested volunteers. Thirty-five people from five municipalities attended the workshop who then used their skills to work on opening a giant logjam during a field trip. Two additional work days in the river were held and a public canoe trip was organized in the fall of 2011 and 2012. The 2012 trip received so much media attention that 49 people participated and were able to canoe the river without the dam impeding their travel.

The Canoe Expedition and the publicity it received through this project sparked renewed interest in a river long thought too polluted to paddle. The City of Wayne has embraced the river and is organizing its first Rouge-a-Palooza, a river-focused festival in Goudy Park where the dam once stood, complete with a canoe race, canoe trip, rubber duck race, food trucks, displays and bands. A paddling concession has opened on nearby Newburgh Lake with plans for regular trips on the Lower Branch. The initial stages of planning for a Water Trail have begun with an asset inventory slated for late 2013.

Transforming the Rouge AOC from Mowed Down to Grown Up - Benthic Macroinvertebrate Monitoring

Rouge River Watershed, MI

FUNDING SOURCE: Erb Family Foundation, U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Friends of the Rouge, Alliance of Rouge Communities

BUDGET: Erb Family Foundation Grant $80,000; GLRI grant $648,750, $191,591 match provided by Wayne County, City of Southfield, ARC and the Erb Family Foundation

START/END DATE: October 2010 - June 2013

The Transforming the Rouge AOC from Mowed Down to Grown Up project restored riparian corridor, wetlands, and upland habitat in the Rouge River Watershed to advance the removal of the benthos Beneficial Use Impairments (BUI) in the Rouge River Area of Concern. Monitoring of in-stream benthic macro-invertebrate communities was conducted by FOTR, Wayne County staff and volunteers. During the term of the Transforming the Rouge Project, over 719 volunteers participated in the Rouge River watershed macro-invertebrate monitoring with up to 57 sites being sampled in a single monitoring event. A total of eleven sensitive aquatic insect families were collected in the Rouge River Watershed during this time frame. Three of the 11 sensitive aquatic insect families were found for the first time during these monitoring efforts. Although the limited post-project data and other site considerations makes it difficult to correlate the differences in monitoring site scores and trends, with the implementation of the Transforming the Rouge restoration project sites; post-project spring benthic monitoring scores appear to be improving in three of the four subwatersheds associated with the Transforming the Rouge restoration sites. This includes the Main 1-2, the Upper and the Main 3-4. Given more time and additional grow zone investment, these Rouge subwatersheds will also likely realize significant improving trends in their benthic communities as seen in the Middle 1 and Middle 3 subwatersheds, where monitoring data trends are improving significantly where oldest and most extensive grow zones are located.

Spring Data Trend 2001-2013			
Subwatershed	Slope	*p*-value	Significant Trend
Main 1-2	0.5911	0.0026	yes, improving
Upper	0.0761	0.7557	no trend
Johnson Creek	1.0221	0.0017	yes, improving
Middle 1	1.1575	0.0006	yes, improving
Middle 3	1.2307	0.0470	yes, improving
Lower 1	0.3508	0.2734	no trend
Lower 2	-0.0186	0.9655	no trend
Mian 3-4	0.0455	0.9632	no trend
Fall Data Trend 2001-2012			
Subwatershed	Slope	*p*-value	Significant Trend
Main 1-2	-0.3444	0.3077	no trend
Upper	-0.5050	0.0328	yes, declining
Johnson Creek	0.9977	0.0098	yes, improving
Middle 1	0.5993	0.0307	yes, improving
Middle 3	0.7317	0.0336	yes, improving
Lower 1	0.2381	0.4506	no trend
Lower 2	-0.5526	0.2605	no trend
Main 3-4	-1.4883	0.1591	no trend

Sampling the Sump Drain in a tributary of Johnson Creek

Benthic identification

Rouge River Advisory Council

The Rouge River Advisory Council (RRAC), formerly the Rouge River Remedial Action Plan (RAP) Advisory Council, was founded in 1993 to advise the Rouge River Remedial Action Plan Team on RAP issues. Work on "The Rouge River Strategy" was started in October 1985. It later became the Rouge River RAP, and was completed and adopted by stakeholders in 1989. The RAP describes actions needed to clean up and preserve the Rouge River, and sets out a 20-year plan to accomplish these goals. Michigan's RAP process requires that the RAP be updated every two years. A technical group known as the "RAP Team" was formed in 1993 to revise the RAP.

Responsible for advising the MDEQ on the update and implementation of the Rouge RAP, the RRAC formed a number of subcommittees to deal with more specific issues such as habitat destruction, nonpoint source pollution (such as storm water runoff), on-site sewage disposal, public education, contaminated sites, and headwater land use. They also act as liaison with the public at large and with interest groups to ensure that there is adequate public participation in the RAP process.

The mission of the RRAC is to assist in the attainment of the goals of the RAP by enhancing public awareness and education concerning RAP issues, providing a mechanism for the participation of all interested parties, seeking broad-based support for the RAP update, assisting in implementation of the Rouge RAP, and independently evaluating progress toward the goal of restoring designated uses and delisting the Rouge River watershed as an Area of Concern.

In 2008, the RRAC developed the Delisting Targets for Fish and Wildlife Habitat & Population Beneficial Use Impairments (BUIs) for the Rouge River Area of Concern (Delisting Document).

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SPAC Representative: Bill Craig
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Area of Concern Coordinator: Jennifer Tewkesbury
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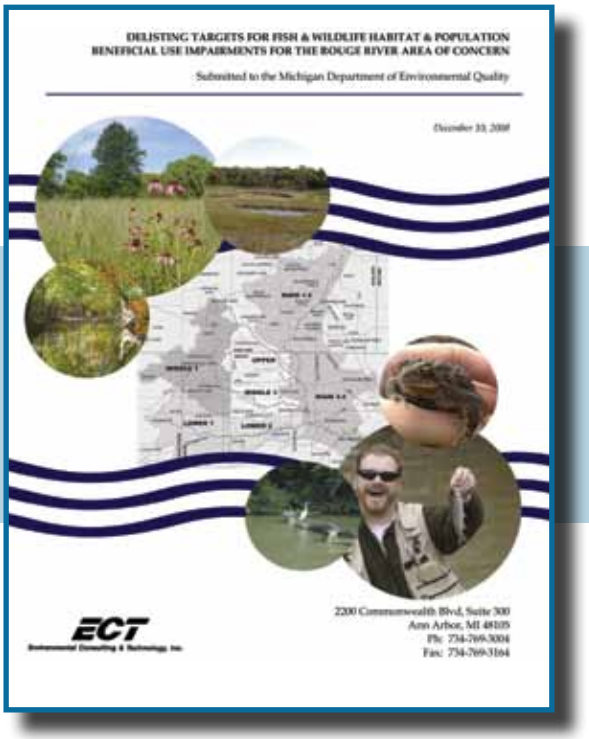

DELISTING TARGETS FOR FISH & WILDLIFE HABITAT & POPULATION BENEFICIAL USE IMPAIRMENTS FOR THE ROUGE RIVER AREA OF CONCERN

Submitted to the Michigan Department of Environmental Quality

December 10, 2008

ECT

Rouge River Watershed Initiatives

Rouge River Watershed, MI

FUNDING SOURCE: Great Lakes Commission - Statewide Public Advisory Council

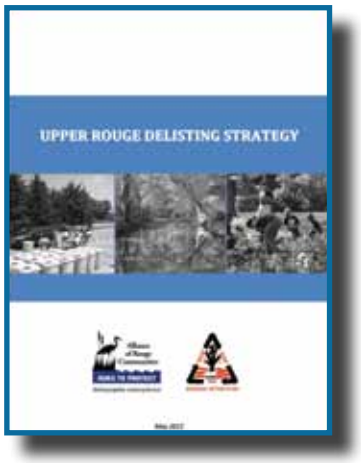
ENTITY RECEIVING FUNDING: Alliance of Rouge Communities

BUDGET: $132,084 (four grants)

START/END DATE: October 2010 - June 2014

RRAC has worked in partnership with the ARC on the following grant-funded initiatives:

GREEN CORRIDORS IN THE ROUGE RIVER WATERSHED (2010): The ARC received Statewide Public Advisory Council (SPAC) funding from the Great Lakes Commission (GLC) to create a process to strengthen stakeholder partnerships and develop proposals for RAP projects and activities in 2010. The funding would also allow the ARC and RRAC to pursue joint funding opportunities to implement green infrastructure restoration activities within public properties along the major branches of the Rouge River AOC as listed in the 2008 Delisting Document.



DEVELOPING A COORDINATED EFFORT TO ADDRESS ROUGE AOC BUIs (2011): The ARC received SPAC funding from the GLC to build on the work it accomplished by completing the following tasks: 1) Improve and refine the Rouge River AOC Delisting Strategy developed under the previous PAC grant, 2) Create a Subwatershed Delisting Strategy Template for the Rouge Upper Subwatershed to illustrate the community projects, the areas to install Rouge AOC priority projects, such as tree planting and grow zones, their location, expected storm water reduction impacts and any project gaps that may exist, and 3) Coordinate activities in the Rouge AOC.

RRAC FACILITATION AND ROUGE RIVER REPORT CARD UPDATE (2012): The ARC received SPAC funding from the GLC to fund activities to re-build RRAC and facilitate RRAC meetings and general business activities in the Rouge River Area of Concern (AOC). These activities include re-establishing a larger active membership list, revising the By-Laws, holding RRAC meetings and year end officer elections, the development of a Rouge River AOC five year vision statement and establishing an RRAC website. The RRAC will also use PAC funds to build on the work it has accomplished in the past several years by completing the following tasks: 1) Prepare a Lower Branch Rouge River Delisting Strategy consistent with the Rouge River Delisting Strategy as well as the Rouge River Watershed Management Plan and 2) Develop a Rouge River Watershed Beneficial Use Impairment (BUI) Report Card to illustrate and communicate progress toward BUI removal.

FACILITATION AND PROMOTION OF THE ROUGE AOC PRIORITY PROJECTS (2013): The ARC received SPAC funding from the GLC: to continue to re-build RRAC and facilitate RRAC meetings and general business activities in the Rouge River Area of Concern (AOC) and to prepare detailed project sheets which include improved cost estimates of Rouge AOC priority projects.

RRAC website

Wayne County Department of Public Services, Water Quality Management Division

The Water Quality Management Division works to protect and restore Wayne County's rivers, lakes and streams through the advancement of a holistic watershed management approach. The Division partners with communities, businesses, residents and others to reduce discharges of storm water, combined sewer overflows, and sanitary sewer overflows to the County's waterways. Activities include detection and correction of illicit sewer connections, public education, water pollution management projects, and stream bank stabilization and habitat protection/restoration efforts.

The Water Quality Management Division also manages the County's Rouge River National Wet Weather Demonstration Project, a 20-year national demonstration of a watershed approach to pollution control and natural resource management.

The Division also provides specialized engineering services for capital improvements and other requirements of the County's wastewater and storm water systems.

Public education

Transformation of turf grass to native plant grow zones in Wayne County Parks and properties

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Installation of trees on Wayne County properties

Stream and outfall surveys

Rouge River National Wet Weather Demonstration Project (Rouge Project)

Rouge River Watershed, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) and funding from watershed communities

ENTITY RECEIVING FUNDING: Wayne County with subgrants to local communities and agencies

BUDGET: $540 million, match of $190 million from communities and partners. Wayne County awarded 290 subgrants to watershed communities and agencies to complete $430 million in Rouge River restoration projects

START/END DATE: 1992 - May 2014

THE ROUGE RIVER PROJECT
A WORLD CLASS EFFORT
BRINGING OUR RIVER BACK TO LIFE

The Rouge River Watershed covers 466 square miles of southeast Michigan and is home to more than 1.3 million people in parts of Oakland, Wayne and Washtenaw counties. The watershed's 48 communities comprise a diversity of land uses from the urbanized areas of Detroit, Livonia and Southfield to the developing areas of Troy, Canton Township and Novi, to the rural areas of Salem, Superior and Van Buren townships.

The Rouge Project provided a unique opportunity to demonstrate that a cooperative, locally-based watershed-wide approach to restoring and protecting an urban river system could achieve faster and more cost-effective environmental results than a traditional approach. This river restoration effort was supported by federal grant funds which allowed innovative pollution control strategies to be demonstrated and the success of the holistic cooperative approach to be documented.

The early focus of the Rouge Project was on the control of combined sewer overflows (CSOs) in the watershed. Although control of pollution from CSOs was identified as a major priority, There is a clear inter-relationship of the pollution sources within a watershed that demands an inter-related approach to a solution in order to achieve water quality standards and associated designated uses within a watershed. The project focus became more holistic to consider the impacts from all sources of pollution and receiving water use impairments under a watershed management approach. A piecemeal approach of focusing only on sources of pollution or a group of sources will not achieve the desired results nor will it achieve the acceptance of the residents of the watershed.

Inkster CSO basin

The Rouge River National Wet Weather Demonstration Project is an unqualified success, using any of several measures of achievement. Major progress has been made in the control of pollution being discharged to the Rouge River. For example, CSO pollutant loads to the river have been cut by 90 to 100 percent during most events. In previous years certain water quality standards were violated most of the time at many places in the watershed. Now, the majority of the waters in the Rouge River watershed meet many standards.

Coupled with water quality improvements in the Rouge River, the ecosystem health continues to improve as well, as demonstrated by increased sightings of fish and wildlife along the river each year since 1999. Improvements in the water quality and removal of contaminated sediment in Newburgh Lake in 1998 resulted in the lifting of the fish consumption advisory in 2003 for some species of fish in the lake. This is the first time fish caught in the Rouge River system have been safe for consumption in decades.

Equally important was our effort to reclaim the water course itself. Like most urban rivers, years of flashy hydrology have severely eroded the watercourse making it wider, flatter, sediment laden, and devoid of sustaining habitat. These efforts were led by the communities who took responsibility for the large scale projects like bank stabilization and reshaping the water course. This included a variety of projects that relied on research performed across the country. Thus there are examples of channel improvements, rock wing walls, restored pool and riffles, and the whole array of modifications that help support fisheries and the biology that supports it.

Bank stabilization

The use of green infrastructure techniques across the watershed is primarily intended to address the river's flashiness. Green infrastructure techniques are sometimes referred to as Low Impact Development (LID) techniques. But "green infrastructure" is a broader term representing application in all areas, including new developments, redevelopment and existing properties. It is this last application that is the primary focus of green infrastructure implementation in the Rouge River Watershed. Green infrastructure employs principles such as preserving and re-creating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat storm water as a resource rather than a waste product.

Rain garden

The Rouge Project has supported projects such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing green infrastructure principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, green infrastructure can maintain or restore a watershed's hydrologic and ecological functions.

Bell Creek, Redford Township

Streambank stabilization in Firefighters Park

Pike caught in Newburgh Lake

Restoration of Existing Wayne County Grow Zones

Middle Branch of the Rouge River, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities with Wayne County as partner

BUDGET: $35,200

START/END DATE: 2012 - 2013

This project was part of the GLRI-funded project Transforming the Rouge project which created and improved habitat while making progress toward eliminating the Benthos and Fish and Wildlife Habitat Beneficial Use Impairments (BUIs) for the Rouge River Area of Concern (AOC).

Wayne County DPS contracted with Niswander Environmental, LLC, to develop and implement a short-term restoration strategy and long-term invasive species management plan. Short-term restoration efforts included the burning and/or herbicide treatment of 11.1 acres of grow zone at 13 different locations along the Middle Rouge River. These efforts will also be implemented at Wayne County Grow Zone sites within the Rouge River Watershed (approximately 40 acres at 20 locations) under the long-term plan invasive species management plan which began in 2013 independent of GLRI grant funding.

Prescribed burn for restoration of grow zone, Hines Drive south of Six Mile

Prescribed burn for restoration of grow zone, Waterford Bend, Hines Park

Prescribed burn for restoration of grow zone, Sumac Point, Hines Park

Wayne County Grow Zone Installation

Wayne County, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities with Wayne County as partner

BUDGET: $235,000, match of $74,830 provided by Wayne County

START/END DATE: 2012 - 2013

This project was part of the GLRI funded project Transforming the Rouge which created and improved habitat while making progress toward eliminating the Benthos and Fish and Wildlife Habitat Beneficial Use Impairments (BUIs) for the Rouge River Area of Concern (AOC).

This project was located in the Upper and Lower branches of the Rouge River AOC at 3 locations:

- Lola Valley Park along the Upper Rouge River,
- Inkster Combined Sewer Overflow Retention Treatment Basin (CSO RTB) along the Lower Rouge River
- Venoy Park along the Lower Rouge River.

Wayne County contracted with Michigan Wildflower Farm to install 15.4 acres of newly constructed native plant grow zone adjacent to the Lower and Upper branches of the Rouge River. The Lola Valley Grow Zone is 8.3 acres of wet to mesic seed mix. Several small areas, up out of the floodplain and visible from Beech Daly Road, were planted with one quart potted native plants including yellow and purple coneflower, wild bergamont and black-eyed susan, and were seeded with a prairie seed mix (0.5 acres). Along the Lower Rouge River, 6.6 acres of turf grass was converted to native plant grow zones at Venoy Park (4.0 acres) and adjacent to the Inkster CSO retention treatment basin (2.6 acres).

New 2.6 acre grow zone at Inkster CSO RTB along Lower Rouge River

New 8.3 acre grow zone in Lola Valley Park along the Upper Rouge River

New four acre grow zone in Venoy Park along Lower Rouge River

Toxics Reduction within the Rouge River and Detroit River AOC

Wayne County, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Wayne County Department of Public Services, Water Quality Management Division

BUDGET: $500,000, match of $299,200

START/END DATE: September 2011 - September 2013

The project focused on the prevention of toxic substances being released into the Rouge River Area of Concern (AOC), the Detroit River AOC and subsequently the Western Lake Erie Basin. As home to the "Motor City," Wayne County has a significant number of commercial and industrial businesses that utilize chemicals targeted by the Great Lakes Bi-National Toxics Strategy and/or the EPA Chemical Action Plans. These businesses have a likelihood of mishandling toxics due to the presence of these materials on their properties. In addition, these two AOCs are highly urbanized and are heavily populated resulting in the generation of the largest volume of household hazardous waste (HHW), electronic waste (E-waste) and unwanted medications by county in the state of Michigan. Reductions in discharges of toxic substances were accomplished via two main efforts:

- Aggressive Promotion of E-Waste Collection and multiple HHW (including unwanted medication) Collection Events hosted by Wayne County; and
- Commercial and Industrial Facility Toxic Reduction Investigations to prevent the discharge of toxics and other pollutants into the Rouge and Detroit River AOCs.

The Toxics Reduction project worked towards several of the long-term goals as well as more immediate objectives of the Great Lakes Restoration Initiative Action Plan (Focus Area 1: Toxic Substances and Areas of Concern): Remove Beneficial Use Impairments (BUIs)within the Rouge and Detroit River AOCs.

The project collected over 1.5 million pounds of household hazardous waste, more than 500,000 pounds of E-waste and more than 7,000 pounds of unwanted medicines. Over 13,000 vehicles delivered HHW at eight collection events during the project period. Correction of improper connections, discharges and illicit discharge identified during commercial and industrial facility inspections will eliminate the discharge of over 1.5 million gallons of polluted water per year to the Detroit and Rouge River AOCs.

Wayne County Household Hazardous Waste Collection Day

Illicit connection discharging soapy water to a storm sewer

Restoring the Lake Erie Corridor Through Green Streets Project

Canton Twp. and Van Buren Twp., MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Wayne County with SEMCOG as a partner

BUDGET: $100,000, match of $45,696

START/END DATE: October 2010 - November 2013

Approximately seven acres of mowed turf grass was converted to deep-rooted native grasses, wildflowers and shrubs to reduce and filter polluted storm water runoff. These new grow zones were established within County road rights-of-way along Morton Taylor Road (Canton Township) and within the Ecorse Road boulevard (Van Buren Township). Storm water catch basins were also raised to increase infiltration and reduce the volume of polluted storm water entering open water courses during small storm events.

Grow zone, Morton Taylor Rd. (south of Ford Road), Canton Twp.

Grow zone, Ecorse Road (west of Beck Road), Van Buren Twp.

Wayne County Urban Watershed Tree Plantings

Wayne County, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI) - U. S. Department of Agriculture Forest Division

ENTITY RECEIVING FUNDING: SEMCOG and Alliance of Rouge Communities with Wayne County Department of Public Services

BUDGET: $237,027, match of $57,804 from partners

START/END DATE: 2011 - Ongoing

This project will install an anticipated 1,470 trees (685 to date) within Wayne County road rights-of-way, public works yards and park properties tributary to the Rouge River and Detroit River AOCs. Tree plantings will help replace trees lost to the emerald ash borer as well as reduce polluted storm water runoff, improve the urban tree canopy, reduce energy consumption and reduce air pollution within priority urban areas within Wayne County.

Tree planting at Eureka Road and John Dingell Drive in Romulus

Tree planting at Outer Drive and Warren Avenue in Detroit

Tree planting at Huron River Drive (west of Jefferson Avenue) in Brownstown

Tree planting at Pelham Road (north of Wick Road) in Allen Park

City of Monroe Commission on the Environment & Water Quality

The River Raisin in Southeast Michigan provided the backdrop for some of the most pivotal points in Michigan history. The area hosted a battle in the War of 1812, which so inspired American revolutionaries that "Remember the River Raisin!" was their rallying cry as they drove the British from Michigan forever.

Years later, a different revolution would come to the banks of the Raisin – the Industrial Revolution. New industries sprang up in the Monroe Port area, forever changing the face of our beloved watercourse. Today, the River Raisin AOC is part of a new restoration revolution, which looks to heal this historic site, and provide new habitat restoration projects for the birds, fish, wildlife, and people who find themselves drawn to its running waters.

In 1987, the River Raisin was designated a Great Lakes Area of Concern, with polychlorinated biphenyl (PCB) contaminated sediment the primary issue. Nine Beneficial Use Impairments (BUIs) were identified for the Raisin AOC, and after significant work only six BUIs remain.

Over the past two decades the River Raisin Remedial Action Plan Public Advisory Council (PAC) has been working tirelessly on restoring the River Raisin. The PAC is nested under the City of Monroe Commission on the Environment (COTE), making it possible for the City of Monroe to be an AOC grantee. COTE members have served as the Public Advisory Council on the many River Raisin Remediation Projects over the past 25 years, with the remediation of the PCB-contaminated sediments in the River as our top priority. Commissioners are very excited with the prospect of the final PCB Remediation occurring in 2014, as this EPA project should remove three more BUIs, placing us well on our way to delisting.

Old factory on River Raisin

The River Raisin PAC/COTE has been working seamlessly with the USEPA, MDEQ, NDNR, USACE and the City of Monroe since 1987 to implement programs designed to remediate all nine of the Beneficial Use Impairments and ultimately de-list the River Raisin as an Area of Concern.

Many recent projects have been funded throughout the River Raisin to address the Loss of Fish and Wildlife Habitat and Degradation of Fish and Wildlife Populations BUIs, with great results, but three large scale habitat projects were specifically designed to compensate for the loss of Habitat in our AOC. The projects include, Sterling Island Habitat Restoration, Sterling State Park Projects and Fish Passage (Phase I and Phase II).

All together, these Habitat Restoration Projects drew nearly $7 million in funding from the Great Lakes Restoration Initiative and more than $17 million from EPA and DEQ. This investment provides extraordinary benefits to the River Raisin's plant and animal inhabitants, as well its human neighbors and visitors.

Our sincere hope is that, with the crescendo of this restoration revolution, the Raisin will shed its AOC designation, providing a new reason for people everywhere to "Remember the River Raisin!"

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Sterling Island Habitat Restoration

Monroe, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI), Michigan Department of Environmental Quality (MDEQ)

ENTITY RECEIVING FUNDING: City of Monroe

BUDGET: $500,000

START/END DATE: December 2011 - June 2013

Sterling Island has experienced significant erosion and has been identified as a contributor of sediment that has impaired aquatic habitat downstream. The Sterling Island Habitat Restoration was specifically listed as a project required for the removal of the Degradation of Fish and Wildlife Populations and Loss of Fish and Wildlife Habitat BUIs in the River Raisin AOC.

The goals of the project were to:

- Control bank erosion to reduce sediment contributions that impair habitat downstream; and,
- Provide shallow water and refuge habitat within the river.

Through study of existing data, on-site measurements, and analyses it was found that river flow velocity, even during extreme flood events, is relatively low at Sterling Island. Therefore, the erosion at Sterling Island cannot be attributed to river flow. Instead, it appears that wave action and ice scour were the primary mechanisms causing erosion. Observations of ice jams at the head of the island and moving along the streamward edge of the island were reported by local officials. During ordinary high water events wave action caused primarily by prevailing winds (boating is not common while ice is still on the river) caused ice to scour the bank. During the ice-free period, wave action from prevailing winds and recreational boating caused constant scour of the bank during ordinary high water events as well as lower events due to wave run-up. Due to the constant action (i.e. moderate intensity, long duration scour) during prolonged water levels at or near the ordinary high water elevation vegetation was not able to establish low on the bank face and the tree/shrub root structure was not controlling the erosion.

Understanding the cause of the erosion, led to the proposed design: A rock deflector and longitudinal stone toe are proposed to provide protection of the existing bank against river flows, wave action, ice flows and Lake Erie seiches. Grading at the upstream point of the island (and installation of timber steps) was proposed to provide controlled access to the water to prevent erosion caused by pedestrian foot traffic. In addition to providing protection of the existing banks by deflecting flow and ice, the rock deflector will provide aquatic habitat benefits, including a rock-substrate spawning area and basking area for waterfowl and turtles. Lastly, the rock deflector improves angler access to the River Raisin fishery. Angler foot traffic was the primary cause of bank erosion at the head of the island.

Sterling State Park Projects

Monroe, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Michigan Department of Natural Resources

BUDGET: $3.42 million

START/END DATE: November 2010 - December 2013

William C. Sterling State Park is situated on the Lake Erie shoreline just north of the River Raisin. The mouth of the River Raisin historically formed a large delta of wetlands extending from downtown Monroe to the Lake Erie shoreline. These wetlands supported unique natural landscapes called Great Lakes marshes and lakeplain prairies, which in turn provided critical habitat for many species of animals, including birds, reptiles, amphibians, fish, and other aquatic life. Most of the historical wetlands on the western Lake Erie shoreline, including the River Raisin delta, have been lost through many years of development and agriculture. Wetland restoration projects at Sterling State Park were identified by the Public Advisory Committee as required for the removal of the Degradation of Fish and Wildlife Populations and Loss of Fish and Wildlife Habitat Beneficial Use Impairments in the River Raisin Area of Concern.

The goals of the Sterling State Park projects were to:

- Restore 18 acres of emergent and submergent Great Lakes marsh and 32 acres of lakeplain prairie
- Repair dikes and install water control for 310 acres of marsh to provide much needed stopover habitat for shorebirds and to facilitate invasive plant control
- Control invasive phragmites (Phragmites australis) in north River Raisin delta wetlands on approximately 1,100 acres of public and private land for 3-5 years
- Collect baseline data and monitor wetland communities and key species in the north River Raisin delta wetlands

All construction and earthmoving work related to the first two goals was complete by December 2012. Phragmites control and mapping were successfully implemented at Sterling State Park and on 12 adjacent landowners' properties in 2011, 2012, and 2013. Baseline mapping of all wetlands within the project area was completed in 2011. Monitoring data were collected on shorebird and fish populations in 2011 (pre-restoration) and are planned to be collected again in 2014 (post-restoration).

Wetland restoration construction

Water control structure installed by DU and MDNR staff

Fish Passage Phase 1/Phase 2

Monroe, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI), Michigan Department of Environmental Quality (MDEQ)

ENTITY RECEIVING FUNDING: City of Monroe

BUDGET: $2.96 million, $100,000 match

START/END DATE: August 2012 - 2013

The River Raisin has a rich history and was once renowned for its natural resources like the American lotus, its rich fish populations and excellent hunting. Early Native American inhabitants knew the river as "Nummasepee" or "River of Sturgeon".

1933 dam construction

Prior to 1930 sewage from our community was conveyed to the River Raisin and just discharged. In 1933 the City constructed six low head dams in the Raisin. This so-called Beautification Project was built to house new sanitary sewers bringing wastewater across the River to our new (at the time) Wastewater Treatment Plant. Needless to say, this much needed public works project blocked the migration of fish, and created stagnant backwaters behind the dams. Because of this activity, the sturgeon that lent its name to our River, are no longer found in Monroe.

Recent restoration efforts have taken action to restore the once thriving waters of the River Raisin. The City of Monroe River Raisin Fish Passage Project aims to reconnect Lake Erie to the lower 23 miles of the river, allowing passage of fish, canoes, and kayaks, and will help compensate for the loss of fish and wildlife habitat and degradation of fish and wildlife populations in our AOC.

By late 2012 Phase I reopened 3.5 miles of river through the hart of downtown Monroe, by the removal of two low-head dams and the installation of rock arch rapids at two locations in the City. Providing fish and other aquatic organisms access to parts of the river otherwise inaccessible for the better part of the last century. Today, people have reported sighting eagles and osprey hunting in restored areas, ducks and geese have found a new home and folks fish the area every day.

Phase II construction started in September 2013, and will reconnect and additional 19.5 river miles by installing two rock arch rapids, constructing a small channel adjacent to Waterloo Dam and cleaning out Grape Mill Race. Phase II completion date - end of 2013.

Low-head dam removal

Phase II construction

Rock arch rapids installed

PCB Sediment Remediation

Monroe, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI), Great Lakes Legacy Act

ENTITY RECEIVING FUNDING: City of Monroe

BUDGET: $17.3 million

START/END DATE: April 2012 - November 2013

In 1987, the River Raisin was designated a Great Lakes Area of Concern with PCBs in sediment the primary chemical of concern. In 1997, Ford Motor Company removed 20,000 cubic yards of highly PCB-contaminated sediment from the AOC, under USEPA order. From 1998-2002, the USEPA and MDEQ conducted post-remediation sediment monitoring, finding that high levels of PCBs remained. PCB contamination caused the following Beneficial Use Impairments (BUIs): Restrictions on Fish/Wildlife Consumption, Bird/Animal Deformities/Reproduction Problems and Restrictions on Dredging. To address these BUIs, the Great Lakes Legacy Act Agreement on April 3, 2012, provided $17.3 million for the remediation project.

The USEPA Contaminated Sediment Remediation Project includes excavation of a portion of the Sterling State Park Confined Disposal Facility (CDF) and then using it to dispose of PCB-contaminated sediment from the AOC. First a mechanical dredge removed approximately 3,000 cubic yards of the most highly contaminated material, transferred it to the adjacent Ford Motor Company property, and processed it for disposal at a licensed landfill in Wayne County, Michigan, about 35 miles north of the site. Next, a hydraulic dredged sucked the remaining 80,000 cubic yards of PCB-contaminated sediments from the river bottom and pumped them to the CDF for final disposal. The use of the CDF required the removal of an equal volume in order to preserve the capacity of the CDF for future navigation channel maintenance. Prior to removal, test at the CDF confirmed that 112,000 cubic yards of CDF material was inert and the material was excavated, dewatered, and stockpiled at the Ford property site for future use.

Dredging equipment

Dredging equipment

Alliance of Downriver Watersheds

The Alliance of Downriver Watershed (ADW) members have been formally and informally working together for several years to manage the area's water resources on a watershed basis and to comply with federal regulations regarding the discharge of storm water. The ADW is a permanent watershed organization formed under Public Act 517 of the Public Laws of 2004. The ADW was formed in January 2007 and consists of 23 public agencies in the Ecorse Creek, Combined Downriver, and Lower Huron River Watersheds in southeast Michigan. The agencies and communities that comprise the ADW believe there are substantial benefits that can be derived by joining together and cooperatively managing the rivers, lakes, and streams within the watersheds and in providing mutual assistance in meeting state water discharge permit requirements of the members.

Together, the ADW members work to help meet NPDES permit requirements including:

- Advanced Illicit Discharge Elimination Investigations
- Public Education Efforts
- Public Participation Efforts
- Stream Monitoring
- Training Opportunities
- Progress Report Assistance
- Audit Assistance

The ADW's approach of collaborative storm water management also provides the following benefits:

- Cost sharing and reduction through a watershed approach.
- Regular meetings with Michigan Department of Environmental Quality (MDEQ) representatives allows ADW members to discuss the latest permit news and any problems/solutions with surrounding local government representatives.
- Local governments come together as a single voice and have the ability to influence higher decision-making.
- Since the formation of the ADW, the team has secured nearly $1.5 million in federal and state grants to implement nearly $2.3 million in water quality improvement projects in the downriver watersheds.

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Chair: Mark Gahry
Brownstown Township

Secretary: Bill Turner
City of Lincoln Park

Vice Chair: Brian Arp
City of Gibraltar

Sunrise at Pointe Mouillee in Ecorse Creek

Photo credit: Mike Grosso, Outlaw Photo

Green Infrastructure Campaign within the Alliance of Downriver Watersheds

Wayne County, MI

FUNDING SOURCE: Michigan Department of Environmental Quality (MDEQ) Clean Michigan Initiative Clean Water Fund and MDEQ Federal 319 Non-point Source Grant

ENTITY RECEIVING FUNDING: Alliance of Downriver Watersheds

BUDGET: $774,800, $456,400 match

START/END DATE: 2009 - Ongoing

Over the past five years, the ADW has implemented a green infrastructure (GI) campaign to help reduce the amount of runoff reaching the Ecorse, Frank & Poet, Blakely, Brownstown creeks and the Lower Huron River. The ADW has completed a land cover survey to establish a baseline of impervious area coverage in the watershed and designed and installed 12 GI projects. This included 5.7 acres of grow zone and 2,200 feet of riparian buffer at 10 locations including three schoolyard habitats and 28,500 square feet of green roofs at two schools within the ADW.

The ADW has also sold more than 225 rain barrels to area residents, and conducted several educational workshops focusing on the use and maintenance of native plants, grow zones and rain gardens.

The ADW has also assisted schools in taking part of the State of Michigan's Green School Program which encourages all public and private schools to administer energy-saving and environmental activities. This assistance included the distribution and planting of 100 school yard trees and 4000 seedlings to numerous schools and at events throughout the watershed.

Frank & Poet Creek – Riparian Grow Zone in Trenton - photo credit: Robert Burns, Friends of Detroit River

Riparian Grow Zone in Trenton

The Stewardship Network

The Stewardship Network connects, equips and mobilizes people and organizations to care for lands and waters in their communities. We train, develop, and support a vibrant group of conservation leaders – both volunteer and professional – as the foundation for collaborative conservation across North America. We build the capacity of partner organizations and individuals through the development of model conservation projects and implementation of landscape-scale region-wide initiatives. We help volunteer leaders and organizations tap into The Network's wealth of knowledge and experience in conserving and protecting our native lands using scientifically based, field-proven conservation techniques and applying technology-based platforms to link these efforts across time and distance.

Our collaborative model is unique in the conservation world, as we ask the critical question "what do you need?" The Stewardship Network is not driven by single species objectives nor presented on a scale so large as to be meaningless to those on the ground who are able to make lasting impact. Rather, we tailor our support to each individual community's needs.

Stewardship Network Clusters
Clusters increase communication and resource-sharing among people in a targeted geographic area. Clusters serve as subnetworks on a scale that allows frequent face-to-face interaction and informal conversation.

What do Clusters do?
Clusters have two main areas of focus: 1) on the ground conservation action and planning, and 2) educating community members in conservation issues, techniques and other relevant topics. With assistance from Network staff and partners, each cluster focuses on local conservation issues and plans to address those concerns through implemented action. The Cluster also provides unique education opportunities through events, workshops, activities and on-line networking to shares ideas, information, skills and resources to enable local groups to increase their capacity to care for local natural areas. The Cluster members, with support and input from Network staff, determines the activities it engages in.

"The Stewardship Network is the UP and COMING conservation organization with the right trajectory"
--John Curry, National Fish and Wildlife Federation

Who participates in Clusters?
Participants in Clusters typically include:

- Area land conservancies/trusts
- Parks departments
- Other local government units, such as municipal and township staff
- Corporate landowners
- Private businesses
- Individual volunteer stewards and landowners
- Non-Profit organizations
- Other organizations and individuals interested in protecting natural areas

As a 501(c)3 nonprofit with a strong record of transformational change leadership, The Network is dedicated to facilitating on-the-ground conservation, stewardship, and education.

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"The return on our investment of time in The Stewardship Network is enormous. The increased number and quality of volunteer hours is a direct result of our participation in the Network"
--Ray Fahlsing, Parks and Recreation Division, MI Department of Natural Resources

Community Collaboration to Protect Important Wetland Habitat

Highland, Rose, Springfield, Napoleon, Norvell and Manchester Townships, MI

FUNDING SOURCE: National Fish and Wildlife Foundation – Sustain Our Great Lakes

ENTITY RECEIVING FUNDING: The Stewardship Network

BUDGET: $124,840 grant , $523,627 match

START/END DATE: February 2010 - September 2013

This project impacted over 148 acres in two priority headwaters regions in southeast Michigan. The Stewardship Network worked with partners – organizations, private landowners, staff, and volunteers – to achieve the project goals. This project treated invasive species and restored natural habitats in areas that include rare and imperiled natural communities and/or nine different species of concern, 1000 feet of shoreline and a half mile of riparian corridor. In both the Headwaters and Raisin Clusters, Stewardship Network partners worked together to treat invasive species, which present the greatest threat to ecosystem health and to species of concern.

The key lesson learned by implementing the Community Collaboration to Protect Important Wetland Habitat project is a re-iteration of the amazing ability of local people and organizations to work together to enact positive environmental change. This project enabled The Stewardship Network to expand our impact with local partners in both the Raisin and Headwaters Cluster, where The Stewardship Network has facilitated community conservation for over a decade. In both Clusters, project partners worked together in a variety of ways to make this project successful. This included volunteer sharing, tool and equipment sharing, institutional financial framework support, training, expertise, mapping, and more.

In both Clusters, this project focused holistically on treating invasive species in key project areas. To truly make a difference with invasive species, control efforts cross property lines and involve many people and organizations. Most property owners want to do what's best for their land, but they don't know what to do. This project enabled Cluster partners to bring resources to help private and institutional landowners control invasive species on their property and engaged others who are now actively working to restore ecological health to their land. Through The Stewardship Network's Cluster structure, this project positively impacted 147 acres of wetland habitat spread across a variety of partner properties. The Stewardship Network further developed local leadership to successfully engage local landowners in a lasting and meaningful way.

Participants in a workshop organized by The Raisin Cluster of The Stewardship Network learning about the importance and impact of restoration

The globally imperiled fen ecosystem responding to the restoration and management done by The Stewardship Network with funding from Sustain Our Great Lakes

River Raisin Partnership

The purpose of the River Raisin Partnership (RPP) is to implement land and water protection and stewardship projects in the River Raisin Watershed, along with associated public outreach, consistent with the River Raisin Watershed Management Plan. The RRP serves as a coordinating body for ongoing public and private land and water protection and stewardship efforts, ensuring the highest possible level of cooperation and communication, and the least possible amount of overlap in the work of partner organizations.

In 2009, Legacy Land Conservancy, the River Raisin Watershed Council, the Raisin Valley Land Trust, The Stewardship Network, The Nature Conservancy, Washtenaw County Parks and Recreation, and YMCA Storer Camps submitted a proposal to the Michigan Department of Environmental Quality for a nonpoint source pollution grant. These groups agreed that they would work toward achieving tasks in the proposal, and implementing other tasks recommended in the River Raisin Watershed Management Plan, regardless of the outcome of the grant proposal.

The groups were awarded the grant and began work on it together in October, 2010. Since then, the RRP has grown to bring many more partners to the table, all with a commitment to direct land and water protection and stewardship. Partners now also include: the Lenawee Conservation District and Michigan Agriculture Environmental Assurance Program, Michigan Nature Association, Washtenaw Conservation District and the Michigan Department of Environmental Quality. These groups and the charter members continue to work collaboratively in setting priorities and implementing conservation work in the River Raisin Watershed, in addition to pursuing and receiving additional grants for that work.

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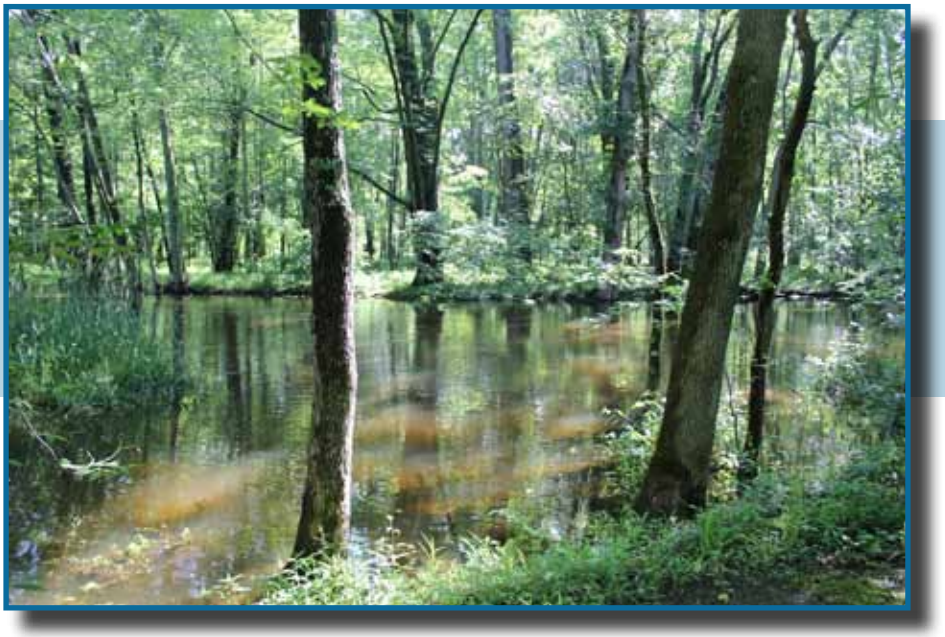

River Raisin Riparian Protection Project

Upper River Raisin, Iron Creek and Goose Creek Subwatersheds, MI

FUNDING SOURCE: Michigan Department of Environmental Quality (MDEQ) 319 Grant

ENTITY RECEIVING FUNDING: Legacy Land Conservancy on behalf of the River Raisin Partnership

BUDGET: $267,635 grant , $270,638 match

START/END DATE: October 2010 - March 2014

This broad-scale partnership involves a wide variety of community stakeholders in understanding and taking responsibility for their watershed. Conservation and protection of water resources takes place at several levels, from individuals seeking information on household practices, to large scale landowners looking to undertake long term stewardship and protection efforts.

The project has facilitated workshops to provide information and assistance to farmers, home owners, and other land owners about practices that can be implemented on their riparian lands for the conservation and protection of water quality. Workshops have covered diverse topics including: land and water connections, wetlands, developing land management plants, prescribed burns and the control of invasive species, and the benefits of conservation easements.

Visits to demonstration projects where land management practices for healthy waters are being implemented have been linked to the workshops. Examples of high-quality wetland landscapes, active restoration and invasive species removal were highlighted by visits to sites including YMCA Storer Camps (Napoleon Township, Jackson County), Leonard Preserve (Manchester, Washtenaw County), and the Iron Creek Properties (Manchester Township, Washtenaw County and Norvell Township, Jackson County). A survey is in progress to monitor the effects of increased awareness of the connections between land use and water quality in the project area.

A fall scene on the Trachet conservation easement

Grant partners are also working with landowners to implement conservation easements, permanently protecting land critical to high water quality. A conservation easement is a voluntary agreement entered into by a private landowner and a qualified organization that permanently restricts development on the subject property. Grants like this one help compensate landowners for their choice to keep their land in a natural condition that helps support high water quality.

For example, Ron and Susan Trachet have protected a 168-acre Norvell Township, Jackson County property with help from this grant. The property is located in the headwaters of the River Raisin and directly contributes to the river's water quality. Thirty-eight acres of the land are a floodplain for the Manchester Drain that empties into the River Raisin at Buss Road. With its varied landscape, the parcel offers habitat for a range of flora and fauna, including critical habitat or the endangered Indiana Bat, which has been studied extensively on the site. Other wildlife observed at the site includes the Massasauga Rattlesnake and Blanding's Turtle, along with deer and pheasants that inhabit the grazing area.

Two additional conservation easements are underway in the project area, and will benefit from this grant's funding. One property has significant natural areas directly on the River Raisin and one of its tributaries. Another property hosts upland and wetland areas which drain to Iron Creek. The conservation easements on these properties assure they will function to keep the River Raisin clean without the impairments of development.

River Raisin Riparian Protection Project Phase II

Upper River Raisin, Iron Creek and Goose Creek Subwatersheds, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Legacy Land Conservancy on behalf of the River Raisin Partnership

BUDGET: $103,954

START/END DATE: October 2012 - October 2015

This project works to permanently reduce sediment loads in the River Raisin Watershed by layering agricultural sediment reduction Best Management Practices (BMPs) with conservation easements. BMPs include planted filter strips and riparian buffers designed to remove sediment from agricultural runoff. Establishing conservation easements can shift these traditional BMPs from temporary measures dependent on the landowner to permanent features of the landscape. Seen as an extension of a 319 Clean Water grant received by the River Raisin Partnership, this project targets three subwatersheds with high percentages of agricultural land where efforts to preserve natural land cover already exists, contributing to an aggregate solution to high sediment loads in the Lake Erie Basin.

Through outreach and education efforts, grant partners will expand the use of sediment-reducing BMPs under the Environmental Quality Incentives Program (EQIP) in the project area; maximize use of funding from the USEPA's GLRI for expanded EQIP efforts in the River Raisin watershed; and increase farmland easement applications to the Washtenaw County Natural Areas Preservation Program.

Project partners and local government officials discuss how farmland best management practices and conservation easements affect water quality in the River Raisin, with hosts from Alber Orchard.

Western Lake Erie Basin Michigan Agriculture Environmental Assurance Program; Water Quality Workshops and Bay Sails

Throughout Michigan

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI), Michigan Department of Agriculture and Rural Development

ENTITY RECEIVING FUNDING: Bay Sail Appledore Tall Ships through a subgrant from Grand Valley State University

BUDGET: $291,721

START/END DATE: 2011 - 2013

The Michigan Agriculture Environmental Assurance Program (MAEAP) is an innovative, proactive program that helps farms of all sizes and all commodities voluntarily prevent or minimize agricultural pollution risks. MAEAP was developed by a coalition of agricultural farmers, commodity groups, state and federal agencies, and conservation and environmental groups. While the Michigan Department of Agriculture is the verifying agency, MAEAP is not a government or regulatory program, but rather a partnership effort.

MAEAP teaches farmers how to identify and prevent environmental risks and work to comply with state and federal environmental regulations. MAEAP offers areas of concentration known as systems: the Farmstead System addresses environmental risks of the entire farmstead; the Cropping System primarily focuses on cropping activities; and the Livestock System focuses on livestock activities, regardless of the size or species of a livestock operation. Farmers who successfully complete the three phases of a MAEAP system (education, on-farm risk assessment, and third-party verification) are rewarded by becoming verified in that system.

A recent innovative outreach effort has seen the Bay Sail Appledore Tallships partnering with Inland Seas, Michigan State University, Lenawee Conservation District and MAEAP to sponsor water quality workshops and bay sails. The sails take agricultural leaders out on the water to learn issues of concerns on our Great Lakes. To date, over 300 agricultural leaders, comprised of Michigan agricultural producers, Conservation District staff, MAEAP technicians, Natural Resources Conservation Service staff and partners have participated in a Water Quality Workshop aboard the Appledore Schooner going out on the Saginaw Bay and the Detroit River. As Blaine Baker from Bakerlad Dairy remarked, "Our Great Lakes are a valuable resource. I was really surprised by all that I learned about runoff and sedimentation's effects on water quality. More farmers need to get out on these sails, more farmers need to get going on getting their farms MAEAP verified - there is a connection to what is going on in the fields to what is happening in the Great Lakes."

Proud farmers and family of the VanWashenova Farm pose with their sign proclaiming their MAEAP verification

Participants in a Water Quality Bay Sail, July 21, 2013. The sail was a partnership between Appledore Tallships, the Lenawee Conservation District, and MAEAP

River Raisin Nitrate Total Maximum Daily Load (TMDL) Reduction

River Raisin Subwatersheds, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: MDEQ - contracted to Lenawee Conservation District

BUDGET: $893,357

START/END DATE: January 2010 - September 2013

Landowners help to reduce nitrate entering the river, streams and ditches through Best Management Practices (BMPs) implemented in their farming operation. Our goal is to reduce nitrate levels by 50% in a 207 square mile area with the hope that BMPs will increase over time and become more widespread. This will result in continued reduction until the TMDL goals are achieved.

Drainage water management structure with Garage of Knowledge participants

Best Management Practices Auction

River Raisin Watershed, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: MDEQ - contracted to Lenawee Conservation District

BUDGET: $438,031

START/END DATE: January 2010 - September 2013

Landowners submit bids to install Best Management Practices (BMPs) to reduce sedimentation from entering the river, streams and ditches. Michigan State University evaluates the bids using software that factors the soils, slope, crop rotation, funding needed, and proximity to water ways within the entire River Raisin Watershed to determine ratio of sedimentation savings to cost for implement the BMP. Landowners can submit bids for filter strips, cover crops or residue management. BMPs with the greatest sediment savings are cost-shared with the landowner.

Cover crops fly-on

Clinton River Watershed Council

The Clinton River Watershed Council (CRWC) is a 501(c)3 non-profit organization which provides programs and services in the areas of watershed management, education and stewardship. For more than 41 years, CRWC has served to coordinate the efforts of local governments, businesses, community groups and individuals in improving water quality, promoting innovative watershed management techniques, and celebrating the river as a natural and recreational resource. CRWC is supported by local and county government membership dues, business, individual and civic memberships, corporate sponsorships, state, federal and private foundation grants, and individual contributions. The mission of the CRWC is to protect, enhance and celebrate the Clinton River, its watershed and Lake St. Clair.

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Cascade and Wolcott Dam Removal

Ray Twp., MI

FUNDING SOURCE: U. S. Fish and Wildlife Service and National Fish and Wild Foundation

ENTITY RECEIVING FUNDING: Clinton River Watershed Council

BUDGET: $226,570

START/END DATE: Fall 2009 - Fall 2011

In 2010, the Clinton River Watershed Council (CRWC) and the Michigan Department of Natural Resources (MDNR) removed two failed dams in the North Branch of the Clinton River. The Cascade and Wolcott dams were removed to increase habitat for aquatic species and to allow access/passage for resident and migratory species from Lake. St. Clair. The Cascade Dam was originally built as an impoundment for a development of homes and parkland decades ago. Pieces of the structure had been crumbling over the years and the site was an impediment to fish passage, a safety hazard and an aesthetic degradation of the resource. Most of the dam and accessory structure was removed but a small remnant was left in place as a piece of history. The site has been restored and is functioning as a complete ecosystem.

Paint Creek Habitat Restoration Dam Removal

Oakland Twp., MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Clinton River Watershed Council

BUDGET: $732,806

START/END DATE: Fall 2010 - Fall 2012

In 2010, the Clinton River Watershed Council (CRWC) was awarded funding through the GLRI to remove the Paint Creek Dam. The partners on the project included Michigan Department of Natural Resources and Oakland University. Technical advisors included Bryan Burroughs, Michigan Trout Unlimited, Jim Francis and Chris Freiburger, MDNR, Don Carpenter, Lawrence Technical University and Scott Tiegs, Oakland University. The Paint Creek dam was designated by the MDNR as a priority dam for removal. Paint Creek is the only cold-water stream and trout fishery in Southeast Michigan.

The accomplishments of the project included restoring fish passage to 7.25 miles of Paint Creek, restoration of stream banks, and reconnection to the floodplain and area wetlands. Fish passage and complete ecosystem functions have been restored for the entire 16 miles of Paint Creek.

Lake St. Clair Coastal Marsh Restoration

Harrison Twp., MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Macomb County Planning and Economic Development Department

BUDGET: $1.49 million

START/END DATE: Fall 2010 - Winter 2013

In 2010, GLRI funding was awarded to Macomb County and the Huron-Clinton Metropark Authority to restore the coastal wetlands at Lake St. Clair Metropark in Harrison Township. Partners in the project included the Clinton River Watershed Council and Wayne State University.

The goals of this project were to restore the coastal wetlands as close to pre-settlement conditions as deemed possible, as well as restore hydrology and control invasive species in the marsh. Pre and post-monitoring included, bird, reptile, amphibian, plant and macroinvertebrate surveys. The majority of the project centered around the Point Rosa Marsh area at the southwest corner of the park. Hydrology was restored along with the plant community and educational amenities such as boardwalks and interpretative signage were installed.

During construction

Restored marsh

"Wait, Wait . . . Don't Step There, Fish Here"

Rochester Hills, MI

FUNDING SOURCE: River Network grant funded by Miller-Coors

ENTITY RECEIVING FUNDING: Clinton River Watershed Council

BUDGET: $25,000

START/END DATE: Spring 2012 - Winter 2012

In 2012, the Clinton River Watershed Council received a competitive public-voted grant from River Network funded by Miller-Coors for streambank stabilization and native planting along the Main Branch of the Clinton River at Yates Park in Rochester Hills. The project partners included the City of Rochester Hills and the local Trout Unlimited chapters. Yates Park is one of the watershed's most popular fishing sites and this project was designed to encourage angler use while reducing the impact on the stream banks in the park.

The project restored 300 lineal feet of eroded streambank preventing sedimentation into the Clinton River by reshaping the banks, planting native plants and directing fisherman foot traffic to a designated location. Public education included three volunteer planting days and an interpretive sign about the project.

After restoration

During construction

Avon Creek Restoration

Rochester Hills, MI

FUNDING SOURCE: U. S. Fish and Wildlife Service Great Lakes Basin Fish Habitat Partnership

ENTITY RECEIVING FUNDING: City of Rochester Hills

BUDGET: $373,500

START/END DATE: 2008 - 2012

In 2008, the City of Rochester Hills received a grant from the U.S. Fish and Wildlife Service for the restoration of Avon Creek. Using innovative river restoration techniques, 825 feet of incised channel was restored to improve habitat, fish passage and reduce water temperatures. Additionally, vernal ponds and riparian wetlands were created, and invasive plants were removed and replaced with native species.
Plans to restore habitat further downstream are currently in progress. A 300-foot riffle-pool channel was installed that transitions into a section of step-pool stream to bypass the pond. This allowed for fish passage, a reduction in stream temperatures, and a reduction in maintenance costs. The city also installed over two acres of no mow zones by installing native plants.

Avon Creek before

Restored Avon Creek

Detroit River Public Advisory Council/ Friends of the Detroit River

The Detroit River Public Advisory Council (PAC) was established in conjunction with the Great Lakes Areas of Concern Program to facilitate public involvement in cleanup efforts due to legacy contaminants and environmental issues. The PAC provides advice to state and federal agencies on issues of concern to local communities and reviews and helps write the Remedial Action Plan. The PAC is broadly representative of stakeholders in the Detroit River Area of Concern. The Friends of the Detroit River have had a presence on the PAC since its inception and currently serve as fiduciary and support numerous PAC projects through grant management and administrative assistance. Recent projects such as the Detroit River sediment mapping project and habitat restoration at Belle isle's Blue Heron Lagoon and South Fishing Pier would not have been possible without the leadership and support of FDR.

The Friends of the Detroit River (FDR) is a grass roots citizens organization dedicated to improving the quality of life for people, plants, and animals along the Detroit River and within the communities of southeastern Michigan and southwestern Ontario. FDR is a community-based advocacy, educational, and environmental group that watches and works to protect the Detroit River. Since 1992, we have focused on Detroit River issues and have endeavored to protect the river through grass roots activism, river programs, research, and partnerships.

Significant PAC Achievements

- Assisted with $3.1 million in Great Lakes Restoration Initiative funding for 3 habitat restoration projects
- Completed the Delisting Plan for Fish & Wildlife Habitat & Population BUIs
- Completed a sediment mapping project to identify highest priority zones within the river
- Secured funding to support Friends of the Detroit River's support of the PAC
- Partnered with Michigan Sea Grant and other partners to complete 2 fish spawning reefs and secure funding for another

Significant FDR Achievements

- Helped to save Humbug Marsh
- Established the Detroit Riverkeeper program
- Worked to prevent the expansion of Countywide Landfill
- Annual Detroit River Cleanups
- Completed Frank & Poet Shoreline Restoration
- Revived the Detroit River Remedial Action Plan
- Annual "Shiver on the River" events on Belle Isle
- Riverkeeper's successful Storm Drain Labeling program
- Numerous public forums, speaking engagements, school visits

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Chairman: David Howell
river@detroitriver.org

Blue Heron Lagoon Restoration Project

Detroit, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Friends of the Detroit River

BUDGET: $1.42 million, $30,655 match

START/END DATE: September 2010 - August 2013

Funded in 2010 by the U.S. Environmental Protection Agency (USEPA), through the GLRI, the Blue Heron Lagoon project was completed in summer of 2013 to restore critical habitat for fish and wildlife and accelerate removal of Beneficial Use Impairments in this Great Lakes Area of Concern. Led by the Friends of the Detroit River (FDR), the USEPA the City of Detroit and a suite of other partners, this project made significant strides to restore the river's ecological function, structure, and biotic diversity.

The Blue Heron Lagoon restoration work is targeted to enhance the entire wildlife community, providing habitat for the reproduction and rearing of fish, herpetofauna, migrating birds and waterfowl. Specific improvements include breaching the lagoon to the river by constructing a 100-foot-wide opening spanned by a pedestrian bridge and the removal of infrastructure (drop structure and grates) at the old pump station discharge channel. The new opening allows the lagoon to capture river flow containing non-swimming fish larva into its zooplankton-rich nursery habitat. A 0.6-acre peninsula, created from excavated earth and lagoon dredgings, harbors wet prairie plant species, two vernal pools and a sand mound for turtle nesting. Surrounding the peninsula, shallow water emergent wetland and deepwater aquatic plants enhance natural reproduction of Detroit River fish species.

An existing spawning shoal located 500 feet upstream from the island's eastern tip is enhanced as part of this project. A new rectangular shaped spawning bed, 250 feet long by 45 feet wide, is positioned on a relatively flat area of the river bottom in approximately 20 feet of water to release fish larva directly into the Lagoon. Composed of 6-10 inch cobble stone placed on 11,250 square feet of Detroit River bottomland, the spawning bed is designed to attract native Detroit River fish, including lake sturgeon and walleye.

Members of the "Greening of Detroit" group help with planting at the Blue Heron Lagoon site

South Fishing Pier Restoration Project

Detroit, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Friends of the Detroit River

BUDGET: $497,634, $30,655 match

START/END DATE: September 2010 - June 2013

Funded in 2010 by the U.S. Environmental Protection Agency (USEPA), through the GLRI, the Blue Heron Lagoon project was completed in summer of 2013 to restore critical habitat for fish and wildlife and accelerate removal of Beneficial Use Impairments in this Great Lakes Area of Concern. Led by the Friends of the Detroit River (FDR), the USEPA, the City of Detroit and a suite of other partners, this project made significant strides to restore the river's ecological function, structure, and biotic diversity.

This restoration project is located between the South Fishing Pier and the shoreline of Belle Isle. It features three "breakwater" barriers, consisting of core stone and two ton anchor stone, positioned parallel to the pier, and three small rock underwater berms running perpendicular to the pier to protect a newly created aquatic nursery habitat from freighter wake and ice flows. The project area is 1,200 feet long and 90 feet wide. Within the protected zone, three 0.2-acre pools dredged to 10 feet deep provide attractive drop-off zones for fish. Dredgings from the pools were placed in surrounding areas, raising river bottom elevations to support over 2.5 acres of newly created coastal wetland. The project is specifically designed as a nursery for larva fish emanating from a nearby, recently constructed, spawning reef and the existing shoal just upstream from the project site.

Early work included reshaping the bottom of the Detroit River at the site to create deep holes and shallow areas for fish spawning and aquatic plant growth. Work continued throughout the winter and spring of 2013, with all construction and aquatic plant placement complete in late June.

Student volunteers from a number of Detroit area schools helped with planting at the South Fishing Pier

U. S. Steel – Great Lakes Works Restoration Project

Detroit, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Friends of the Detroit River

BUDGET: $670,000, match $105,000

START/END DATE: 2010 - 2013

Funded in 2010 by the EPA, through the GLRI, the U. S. Steel – Great Lakes Works Restoration Project will be completed at the end of 2013 to restore critical habitat for wildlife and accelerate removal of Beneficial Use Impairments in this Area of Concern. Led by the Friends of the Detroit River, in a public/private partnership with the EPA and the U.S. Steel Corporation, this project made significant strides to restore the river's ecological function,structure, and biotic diversity

The project design transforms an industrial riverfront site into viable shoreline habitat for fish, amphibians and waterfowl as well as upland habitat for reptiles, birds, and mammals. The design is for future consideration of 1.7 acres of emergent wetlands, 750 feet of rock shoal (barrier island), and creates over an acre of fish spawning area in the Detroit River and an embayment for turtle and fish habitat. Currently, design and implementation of 1,100 feet of shoreline and approximately 4.6 acres of upland habitat is being restored adjacent to the shoreline through removal of invasive species and replanting with native trees, shrubs, and creation of turtle and snake habitats.

Key Highlights

- 1,000 linear feet of river shoreline restoration;
- 4.6 acres of upland restoration with tall grass;
- Increased abundance of target species; and
- Changes in recreational angling use.
-

Designs for Future Implementation

- 1.7 acres of wetlands habitat/nursery;
- 750 linear feet of shoal restoration;
- One acre of aquatic habitat/spawning restoration

Stony and Celeron Island Design Project

Detroit River off of Grosse Ile, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI) - National Oceanic and Atmospheric Administration (NOAA)

ENTITY RECEIVING FUNDING: Friends of the Detroit River

BUDGET: $500,000, match $15,000

START/END DATE: 2013 - 2014

In 1815, the Detroit River shoreline consisted of coastal wetland up to a mile wide. Since 1815 there have been dramatic changes from approximately 10.69 square miles to only 0.12 of coastal wetlands. The Detroit River Area of Concern (AOC) has established several fish and wildlife habitat restoration projects along the river that will improve the habitat system and lead to the AOC delisting. Stony and Celeron Islands are two of the projects identified. The Friends of Detroit River and its PAC partner applied for and were funded this year by NOAA, through the GLRI for the Stony and Celeron Island Design Project. Additional partners included local stakeholders, MDNR (who owns the islands), MDEQ and NOAA. This project will provide the plans to restore critical habitat for fish and wildlife and accelerate removal of Beneficial Use Impairments.

The engineering designs project to be funded by this grant will establish the practical limits of wetland and submergent habitat that can be restored within the degraded and eroded areas adjacent to Stony and Celeron Islands in the Detroit River. It is expected, however, that 10,000 linear feet of coastal shoreline and over 100 acres of marsh and submergent habitat can be created and/or protected from further degradation.

Stony Island - The two bays to be restored provide tremendous fisheries for local fish stock, including important spawning and nursery grounds for muskellunge, northern pike, pumpkinseed sunfish, largemouth bass, yellow perch, channel catfish, and bullhead. Historically lake sturgeon, lake whitefish, white bass, smallmouth bass, walleye and rainbow smelt populations have spawned on or upstream of the island. The large rush beds that have replaced the once abundant cattail stands also provide habitat for a large population of muskrat. The area has long been a very productive spot for rare and migratory waterfowl and provides nesting and feeding areas for many species of ducks and wading birds.

Stony Island

Celeron Island - The Island has reverted to a natural state that contains remnants of important emergent and submergent aquatic plants such as vallisenaria, elodea and various potomogeton species. These areas are important spawning, nursery and refuge areas for sport, commercial and forage fish species. The Island provides habitat for deer, mink, muskrat and bald eagle. It is also situated within a major flyway and is therefore an important resting spot for migratory birds and waterfowl such as canvasback duck, trumpeter swan and American coot. The loss of the protective shoreline has led to the loss of much of the complex wetland associations that lined the outer shoreline and the inner bay at the center of the island and a reduction in the once abundant beds of submergent aquatic vegetation. To address this problem, the construction of an off-shore emergent shoal would help to break up the force of incoming waves from the lake during seasonal storms and wind derived seiche activity.

Celeron Island

Restoring Fish Habitat in the Detroit River

Detroit, MI

FUNDING SOURCE: U.S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI) through the Sustain our Great Lakes Program, Michigan Coastal Management Program, Great Lakes Fishery Trust, Environment Canada, Ontario Ministry of Natural Resources. DTE, BASF and others

ENTITY RECEIVING FUNDING: Michigan Sea Grant and Essex Region Conservation Authority

BUDGET: $1.75 million

START/END DATE: 2004 - 2015

Between 2004 and 2012, a team of scientists built two fish spawning reefs in the Detroit River at Belle Isle and Fighting Island and one in the St. Clair River. The team is applying lessons learned during these earlier projects and constructing approximately 2 acres of spawning habitat in U.S. and Canadian waters of the Detroit River in 2013 and 2014. These reef projects are designed to enhance the reproduction of native fish, including lake sturgeon, lake whitefish and walleye.

Rationale: Many fish seek out rocky areas in fast-flowing currents in order to deposit their eggs during spawning season. Unfortunately, most of the natural limestone reefs and rocky areas were destroyed in the Detroit and St. Clair Rivers when shipping channels were constructed. Similar spawning areas in tributary rivers were made inaccessible as a result of dams. Despite massive population declines, the waterways connecting Lakes Huron and Erie continue to support the largest remaining population of lake sturgeon in the Great Lakes. Restoring fish habitat in the St. Clair and Detroit Rivers provides a unique opportunity to help rebuild populations of valuable native fish throughout the region.

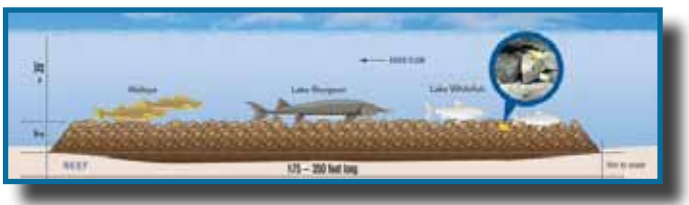
Choosing Sites: Areas with strong currents and deep waters are ideal places to create spawning habitat for the target native species. Scientists at the U.S. Geological Survey developed a computer model using water depth and flows in the St. Clair and Detroit Rivers to predict where lake sturgeon would spawn if the river bottom were suitable.

Project partners used the model to identify high-priority places for constructing reefs and then selected specific locations without contaminated sediments or heavy boat traffic. When possible, reefs are placed close to known spawning areas and upstream of wetlands that could protect young fish after they hatch.

Reef Design: The reef project team is taking an adaptive management approach to each restoration project, questioning and evaluating continuously. Each reef project was constructed using several different types of rock material and different design specifications. Based on three completed projects, the team discovered that 4-8 inch limestone works best to encourage native species development, while discouraging invasive species such as sea lamprey and round goby. The design for upcoming reefs will be relatively simple and cost effective, resulting in a single bed of loose, interlocking rock about 2 feet thick.

Results: Scientists have gathered underwater videos and collected fish eggs and fish larvae on the reefs,confirming that lake sturgeon and a number of native fish species have successfully spawned on the constructed reefs.

Current Plans: In 2013, Canadian partners are expanding the spawning reef project near Fighting Island. In 2014, the project team will create a 1-acre spawning reef at either Grassy Island or east of Belle Isle in the Detroit River, as well as several similar reefs in the St. Clair River. In addition, the team is evaluating locations and seeking additional funds to create up to eight additional acres of fish spawning habitat and compensate for the many square miles of habitat lost historically.



Drawing illustrating the design for future spawning reef projects

Huron River Watershed Council

The Huron River is considered to be the cleanest urban river in Michigan. Much of the credit for this status goes to the Huron River Watershed Council (HRWC) and the people who foresaw the need for its protection. Even though the Council has no enforcement powers, it has accomplished its goals through the use of technical data, factual information and citizen stewardship to influence decisions made by various local agencies.

The HRWC is the first and oldest river protection group in Michigan. Founded in 1965, the Council is a coalition of Huron Valley residents, businesses, and local governments established with the mission to inspire attitudes, behaviors, and economies that protect, rehabilitate, and sustain the Huron River system.

HRWC has grown to be a respected voice in the communities and has a history and reputation of working creatively and cooperatively to tackle a wide variety of issues facing the basin. The Council has worked closely with local governments since its inception to enact local wetland protection ordinances, stormwater management plans, and groundwater protection ordinances in communities throughout the Huron River Basin. The Council also was instrumental in the passage of several of Michigan's wetland and water quality protection statutes, and in passage of State Natural River designation for the Huron. Today, 40 communities, representing over 500,000 people, support the Council's technical assistance, hands-on education and advocacy programs through voluntary membership in the Council.

The Council's staff coordinates a dozen programs and hundreds of volunteers who serve on our boards, committees, and in other volunteer activities. Our efforts fall into three major categories of Education, Technical Assistance, and Science. Our programs cover pollution prevention and abatement, hands-on citizen education and river monitoring, natural resource planning, mass media education and information, and wetland and floodplain protection.

- We have developed the premiere citizen-monitoring network in the State of Michigan. Our strong quality assurance and quality control mechanisms allow agencies all over the State to confidently use this data to direct water protection programs.
- We are in the ninth year of implementing an award-winning mass media campaign aimed at changing behaviors to keep our water safe and clean.
- Our initiatives to reduce phosphorus pollution in the Middle and Upper Huron produced numerous ordinances to protect natural areas, provide stronger protection of wetlands, and to reduce conversion of land and natural habitat to pavement and buildings.
- Our science and policy experts respond daily to residents and government representatives to help them manage development in ways that protect creeks, wildlife, and natural features.

Over the years HRWC has grown from a half-time executive secretary to occasional full-time staff in the 1970s to 1980s, then three to four staff members in the 1990s and now HRWC has eleven staff people. The resources of HRWC have also grown over the past 45 years allowing the breadth and depth of work to expand. The original budget of HRWC was $16,300 in 1967 and is now $1,250,000.

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Website: www.hrwc.org

Executive Director:
Laura Rubin
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River Roundup - *credit: HRWC*

Huron River at the Delhi Bridge - *credit: Marc Akemann*

Mill Pond Dam Removal and Restoration

Village of Dexter, MI

FUNDING SOURCE: Great Lakes Basin Program for Soil Erosion and Sediment Control, Village of Dexter, Washtenaw County road Commission, Michigan Waterways Grant and Michigan Natural Resource Trust Fund Grant

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $1.09 million

START/END DATE: 2002 - 2013

Discussions about the future of the dam began in earnest in 1999, spurred by the anticipated reconstruction of the road and bridge over Mill Creek. HRWC facilitated a task force which recommended full removal of the dam. The Dexter community rallied behind the recommendation, and the Village Trustees voted unanimously for removal of the dam in order to eliminate a public safety hazard, improve stream quality and create recreational opportunities and access for residents and visitors. During this time, the Village of Dexter decided to invest in the dam removal with an eye toward developing a natural park along Mill Creek and downtown.

In 2008 phased removal of the 70-foot wide by eight-foot high rock dam in the Village of Dexter began. Dam removal restored more than 200 miles of stream to free-flowing habitat, and improved the overall health and connectivity of Mill Creek. In the short term, some nutrient-rich sediment did make its way downstream to the Huron river (not all of it was dredged and trapped), but this settled out in the river eventually, and now several years later, the system has been stabilized and is carrying a normal sediment load.

Removal of the dam and impoundment has restored traditional dispersal routes for young-of-the-year fish and aquatic invertebrates. Fisheries scientists expect immediate benefits for fish species that inhabit the Huron River and migrate to tributaries for spawning, including chubs, smallmouth bass and northern pike. A Michigan Department of Natural Resources fisheries survey was conducted at three Mill Creek sites in 2008, prior to dam removal. In 2010, after dam removal, the survey was repeated at the same sites. Fish diversity had increased at each location ranging between two-four additional species. In addition, at the sample site closest to the old dam location, three foot-long northern pike were found.

As a result of improved fish populations, a restored Mill Creek benefits unionid mussels – their larvae take advantage of migrating fish by parasitizing them for several weeks after hatching. Unionid mussels, a group of freshwater mussels, are considered the most endangered freshwater organism in North America. The gravelly streambed and high channel gradient found at the former dam site make suitable habitat for unionids.

HRWC's studies of aquatic insects before and after dam removal revealed that the insect community in 2012 was significantly better than samples taken in the early 2000's. While it would be improper to say that the dam removal itself caused this increase of insects because of too many unaccounted variables, there is definitely a correlation between the two.

The reinvented 1.4 acre park is in the heart of the Dexter business district. Rather than pushing Mill Creek off to the side of the town, Dexter has turned its eyes to the water and has reinvented the look and feel of the village.

Huron River Watershed Buffer Initiative

Huron River Watershed, MI

FUNDING SOURCE: Federal Clean Water Act 319 Grant

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $141,000, match $54,300

START/END DATE: February 2006 - March 2008

The goal of this project was to coordinate and implement a watershed-wide buffer awareness and ordinance initiative that addresses the priorities in seven watershed management plans. Partners included Green Oak Charter Township, Scio Township, Putnam Township, Ypsilanti Charter Township, Huron-Clinton Metropolitan Authority, Livingston County, Oakland County and Washtenaw County.

The initiative, based on a highly visible and advocacy-based policy initiative, has raised the level of awareness and discussion on the importance of riparian buffers and started a movement of passing buffer ordinances at the local level in Southeast Michigan.

Management Practices

- Developed Model Ordinance for Riparian Buffers.
- Assisted four partner communities in adopting a buffer ordinance.
- Hosted four open houses on good riparian management at partner communities.
- Identified buffer restoration and demonstration sites along Huron River.
- Provided technical assistance to small group of individual riparian land owners.
- Interviewed riparian land owners about value of buffer protection.

Information & Education Activities

- Implemented a coordinated information & education campaign in partner communities on the importance of riparian buffers
- Two direct mail pieces to residents.
- Two print ads in local papers to complement direct mail pieces.
- Visual tours of buffers in partner communities.

Mill Creek Streambank Stabilization

Lima Township, MI

FUNDING SOURCE: Federal Clean Water Act 319 Grant

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $127,895, match $50,794

START/END DATE: October 2008 - September 2010

HRWC and the project partners, which included the Washtenaw County Water Resources Commissioner and Legacy Land Conservancy, stabilized two of the most severely eroding spots on Mill Creek where erratic stream flows had eaten away the banks. Preferred bioengineering techniques were employed such as whole tree revetments and live stakes. These sites represent the first examples of these techniques on this creek system. Through a combination of Best Management Practices (BMPs), a combined 360 ft. of streambank were stabilized representing an annual pollution reduction of 33 lbs. of phosphorus and 37 tons of sediment. To keep the repaired sites intact and prevent future problem sites in the drainage area, HRWC and Legacy Land Conservancy assisted landowners who were interested in negotiating permanent protection of their lands. Landowners received information about their properties' importance to Mill Creek and the conservation options available to them. A conservation easement was finalized on one property in the project area.

Information & Education Activities

- Two public information meetings for targeted landowners
- Five mailings to landowners to promote land conservation tools including NRCS and local programs and resources from HRWC and Legacy Land Conservancy
- Print and web content highlighting bioengineering practices used at two sites
- Interpretive signage installed at the two sites

Before stabilization

Installation of soft engineering techniques such as erosion control blankets and trees

Nearly one year after stabilization

Millers Creek Watershed BMP Implementation Project

Ann Arbor, MI

FUNDING SOURCE: Federal Clean Water Act 319 Grant

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $396,962, match $201,730

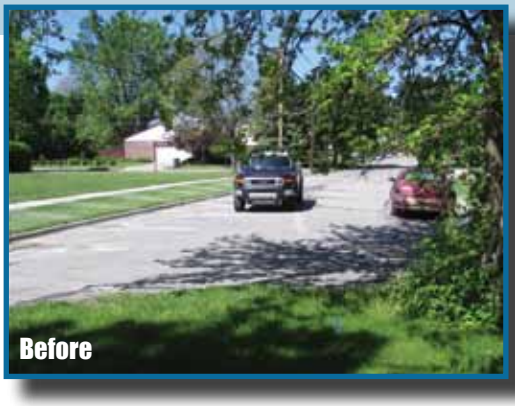
START/END DATE: November 2006 - August 2010

The purpose of this section 319 funded grant was to determine if a series of small Best Management Practices (BMPs), combined with an information and education campaign, could be successful in stabilizing the water flow and improving the habitat and biota of Millers Creek, a highly disturbed urban stream. Partners included the City of Ann Arbor, Washtenaw County Water Resources Commissioner, Millers Creek Action Team, Ann Arbor Public Schools and the Orchard Hills Maplewood Homeowners Association. The project efforts were focused on the creek's headwaters section, where the HRWC built two community rain gardens; helped design four private residential rain gardens; retrofitted a detention pond to hold more rainwater, and distributed rain barrels to residents. In addition, HRWC shared all of its efforts with neighborhood residents, kept them involved in construction projects and maintenance activities, and encouraged them to take initiative in changing their behaviors and using their own property to reduce impacts on Millers Creek. To determine project effectiveness, HRWC collected stream flow, macroinvertebrate, habitat, and channel morphology data prior to and after BMP implementation. The data analysis demonstrated that macroinvertebrates are returning to the creek, and that the creek's flow is less intense after storms.

Best Management Practices and Information & Education Activities

- Constructed a 3,100 square foot rain garden at Thurston Elementary School. Teachers and students participated in the garden's planting.
- Removed 3,900 square feet of impervious asphalt from the dead-end stub of Briarcliff Street and constructed a 5,100 square foot rain garden.
- Local residents volunteered in community rain garden construction and ongoing maintenance.
- Project partners led two rain garden walks to educate local residents how they could build a rain garden of their own.
- Project partners aided local residents in constructing rain gardens on their property.
- Retrofitted a water detention pond to hold more water and replaced the turf grass on the pond margins with native plants.
- Distributed 61 rain barrels throughout the project neighborhood.
- Created and distributed educational material about how neighborhood residents could make a difference for Millers Creek.

Thurston Elementary School students help with planting



RiverUp! A River Renaissance

Huron River Watershed, MI

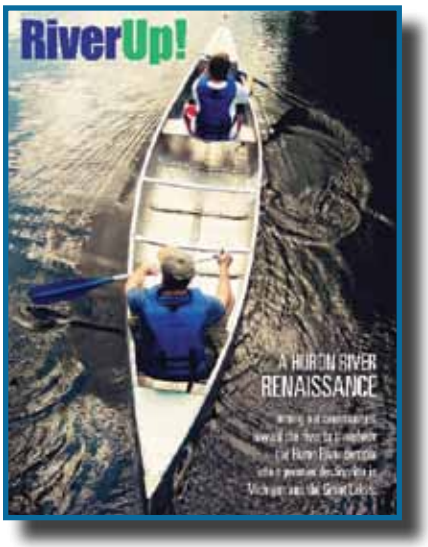
FUNDING SOURCE: Erb Family Foundation; Community Foundation for Southeast Michigan; Private Foundations; and Individual Donors

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $1 million, match $23 million

START/END DATE: October 2012 - September 2015

A renaissance for the Huron River does not happen overnight. We have the benefit of partnering with action-oriented, outcome-focused groups and individuals to advance the considerable work that's already being done for the Huron River.



Fix Up – Invest in river recreation infrastructure
The number and quality of projects that encourage and increased river-based recreation and river corridor investments (public and private) will increase. Canoeing, kayaking, biking, walking, and fishing are among the many pursuits that people enjoy along the Huron. River Much can be done to improve access to the river and riverfront for passive and active uses. Municipal, county, and regional agencies have developed extensive trail and park systems that provide access and venues for these activities with plans for more. RiverUp! augments these projects with particular attention to the five Trail Towns of Milford, Dexter, Ann Arbor, Ypsilanti, and Flat Rock. Featured projects include: Island Park Canoe and Kayak Access Improvement (Ann Arbor, MI); Superior Dam Portage Improvement (Superior Township, MI); and Huron River Water Trail Trip Planning Tools (Paddler's Companion Map Book and Online Trip Planning Site).

Clean Up – Improve the river's ecological health
The total area and number of riverfront and in-stream restoration and protection efforts will increase. All of our hopes and aspirations for the Huron River depend on its ecological health. Cleaning up contaminated areas and restoring river flows and impacted shorelines will help us get there. Remediating legacy pollution sites will require public-private partnerships and creative funding mechanisms. Restoring shorelines and river flows results from adaptive dam operations, selective dam removal, and otherwise clearing impediments to free-flowing water. Featured projects include the DTE Gas property at Broadway Street on the Huron River (Ann Arbor) and Environmental Flows for the Huron River System.

Build Up – Turn our communities to face the river
New and diverse partners will be engaged in RiverUp! projects. RiverUp! envisions the river as the new Main Street for the communities through which it flows. Historically, communities turned away from the river by building with the backs of their buildings facing the river. No wonder, considering there was a time when the river was used primarily for waste disposal, industry, and transportation of livestock. A cleaner river means communities are embracing their spot on a Michigan natural treasure. Transforming the river corridor means linking river towns via water trails, greenways, and even art trails to vibrant downtowns. Imagine spending a weekend staying at B&Bs, dining at waterfront restaurants, visiting local museums and attending music festivals or art fairs. When combined with a robust higher education environment, including a world-class university, the rich talent pool it attracts could be a powerful stimulus to our regional economy. Featured projects include the Ford Heritage Trail District (Ypsilanti, MI) and Huron River Art Trail.

St. Clair River Binational Public Advisory Council

The St. Clair River AOC has seen significant improvements as a result of almost three decades of collaborative binational effort between the Binational Public Advisory Council, government agencies, industry, environmental groups and the public. Loadings to the river have been reduced, contaminated sediments have been remediated, and many projects have improved fish and wildlife habitat.

The St. Clair River had ten Beneficial Use Impairments (BUIs), but now only six remain on the U.S. side. Recent years have seen the removal of Tainting of Fish and Wildlife Flavor, Restrictions on Dredging, Degradation of Aesthetics, and Added Costs to Agriculture and Industry BUIs. Plans are in place and actions initiated with the goal of removing the remaining BUIs on the U.S. side by the end of 2014.

- Fish and wildlife contaminant levels are currently being assessed by the Michigan Department of Community Health toward removal of the Restrictions on Fish and Wildlife Consumption BUI. MDCH is also undertaking increased public education efforts in the St. Clair River.
- Studies have shown U.S.-side benthos to be healthy and relatively uncontaminated. U.S. removal of the Degradation of Benthos BUI is anticipated soon.
- Many projects have been completed with goals of softening the shoreline, reconnecting tributaries to provide shallow habitat for spawning, nursery and feeding areas for fish and wildlife, artificial reefs constructed to provide spawning habitat, and removal of phragmites. Five selected habitat projects are underway. Completion of these projects will fulfill the commitment for U.S. removal of the Loss of Fish and Wildlife Habitat BUI.
- Spills and spill communication have been problematic in the St. Clair River, which is the source of drinking water for roughly one-third to one-half of the residents of Michigan. Chemical spills to the river have been greatly reduced, however the potential for spills is high. Intake monitoring and rapid communication and response are all components of an effective program for the safe and uninterrupted water supply necessary to remove the Restrictions on Drinking Water Consumption or Taste and Odor Problems BUI. We are working to ensure these are in place.
- Studies of birds, frogs and turtles have shown no problems with deformities or reproduction. Additional studies are in progress; results may soon allow the removal of the Bird and Animal Deformities and Reproductive Problems BUI.
- There has been great progress in removal of combined sewers, correction of failing septics and illict discharges, and a capacity upgrade to the Marysville WWTP. Work continues towards the removal of the Beach Closings BUI.

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Photo by Emer Dudley, Wallaceburg

Marysville St. Clair River Living Shoreline Project

Marysville, MI

FUNDING SOURCE: U.S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: City of Marysville

BUDGET: $1.5 million, match $ 300,000

START/END DATE: November 2012 - June 2013

In the winter of 2012, the City of Marysville completed a "living shoreline" project on the banks of the St. Clair River. The project involved habitat restoration, establishing native plant life and structures that resist erosion, but function like natural shoreline.

To accomplish this, the city replaced a failing vertical seawall on the St. Clair River with a reinforced rocky shoreline and an improved walkway and boardwalk. The rocky shores provide spawning and nursery habitat for Great Lakes fish, while wetland and upland prairie vegetation planted this year will benefit birds and other wildlife.

A total of 1,885 feet of steel seawall was removed, creating a more naturalized shoreline. Additional plantings in spring 2013 created a transitional area between the deep waters of the St. Clair River and the wetland and upland areas along the shore.

Shoreline before

Shoreline after

During construction

Upper St. Clair River Shoreline Restoration

Port Huron, MI

FUNDING SOURCE: U. S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration (NOAA), Michigan Department Of Transportation (MDOT) and private donors

ENTITY RECEIVING FUNDING: Community Foundation of St. Clair County

BUDGET: $2.3 million

START/END DATE: Fall 2010 - Fall 2013

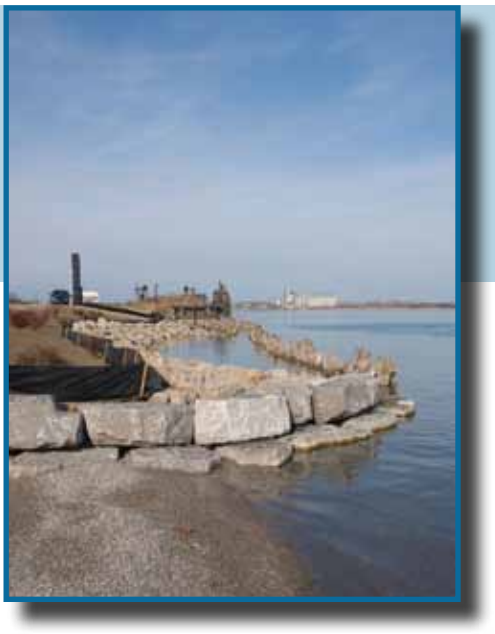
This major habitat restoration project, now known as the Blue Water River Walk, began in 2010 with a piece of waterfront property along the shores of the upper St. Clair River and a vision of what that land could be. Desmond Landing started out as a mile-long stretch of industrial wasteland, but when this project is finished it will be a beautifully restored shoreline with suitable habitat for fish and wildlife, benefiting the public and local economy.

Shoreline restoration began with a pilot phase in fall 2012; through a $250,000 grant from the U.S. Fish and Wildlife Service, approximately 450 linear feet of shoreline was restored. Restoration will be completed with Phase Two beginning summer 2013 with a $2 million grant from NOAA. Aside from habitat and shoreline restoration, there are several other exciting project components, which are geared more towards public access in perpetuity.

Summer 2013 at the Blue Water River Walk

Phase Two of the Blue Water River Walk project is now in progress! During the first week of July, work crews began excavating and removing more debris from the remaining length of shoreline that was not included as part of the Pilot Phase. This will be the most complicated and time-consuming component of Phase Two, but it will be worthwhile. With a restored and naturalized shoreline, the River Walk will be safer and have more places for public access to the water. Fishing as well as wildlife watching opportunities will improve, making this stretch of Desmond Landing an exceptionally pleasant place to spend time outdoors in Port Huron's primarily urban landscape.

The remaining components of Phase Two include construction of the pedestrian trail, the outdoor classroom, Rotary Park, and restoration of the Ferry Dock. The ten-foot, paved asphalt pedestrian trail was funded through a MDOT Transportation Enhancement Grant. It will connect to the sidewalk near the Great Lakes Maritime Center and run the length of the River Walk connecting on the other end to the City of Port Huron's trail at the Military Street underpass. The outdoor classroom, located at the north end of the River Walk, will be a small pebble beach with limestone terrace steps leading down to the water, where there is shallow-water habitat for fish, herpetofauna, and macroinvertebrates. Just above the outdoor classroom area, the Rotary Club is constructing a small park, which the pedestrian trail will run through. Another project component that we are very excited about this summer is restoration of the Ferry Dock which was funded through private donors. The Ferry Dock will be restored with all new decking and railing and made open to the public for activities such as freighter watching and picnicking.



Construction will be taking place for the remainder of this summer and the Blue Water River Walk will reopen to the public in the fall once Phase Two is completed.

The Community Foundation of St. Clair County has also created a new endowment fund to help cover future legacy costs.

Restoring Fish Habitat in the St. Clair River

St. Clair River, MI

FUNDING SOURCE: U.S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI) - National Oceanic and Atmospheric Administration (NOAA) - U.S. Fish and Wildlife Service

ENTITY RECEIVING FUNDING: Michigan Sea Grant, U. S. Geological Society

BUDGET: $4.7 million

START/END DATE: 2010-2015

A broad coalition of federal, state, university and non-profit partners are working to enhance native fish populations by building spawning reefs in the St. Clair River. In 2012, project partners secured $1.2 million in GLRI funding to construct and study nine rock reefs, restoring an acre of fish spawning habitat in the Middle Channel of the St. Clair River. In 2014, the team plans to create up to 6 acres of spawning habitat at two additional locations in the river.

The spawning reefs are designed to benefit several fish species that are threatened or endangered in Michigan, including lake sturgeon, mooneye, northern madtom catfish and river redhorse sucker. Popular sport fish walleye and commercially important lake whitefish will also benefit. Many of these fish migrate great distances from where they are born, therefore the reefs will enhance fish communities in lakes St. Clair, Erie and Huron.

In the early 1900s, the rivers connecting lakes Huron and Erie were straightened, widened and deepened to create shipping channels for large freighters. Dredging and disposal of excavated material in the river damaged fish spawning sites, which led to fish population declines. To compensate for the loss of natural limestone reefs, project partners previously facilitated two reef projects in the Detroit River. The location and design of the St. Clair reefs were chosen based on studies of fish populations and lessons learned during previous reef projects.

Reef Location: Project partners use a hydrodynamic model of the river to identify optimal locations for creating spawning habitat. Clean, fast flowing water is important for keeping the reefs clean and the fish eggs well oxygenated. Reefs should be built 30 to 40 feet below the water - deep enough to prevent plant growth and interference with boat traffic even if water levels fluctuate. Fish larvae are expected to drift off the reefs and settle in the St. Clair delta wetlands, which serve as nursery grounds for young fish.

Reef Design: The reefs are made of loosely piled rocks. Fish eggs stick to stone and remain protected by the gaps between the rocks. Intermediate-sized rocks were selected for these projects because small rocks can be used by invasive sea lamprey, and large rocks can be colonized by invasive round goby. The Middle Channel Reef project evaluated fish preferences for three types of reef material. Results indicate that the location of a reef bed within the river channel is ultimately more important than whether rock is angular or rounded.

Results: In 2012 and 2013, lake sturgeon were observed using the Middle Channel Reefs to spawn. On-going assessment will reveal how other fish species use the reefs and what happens to young fish produced on the reefs.

Lake sturgeon visiting the Middle Channel reef during spawning season

Future Reef Projects: Project partners have secured $3.5 million in GLRI funding to create up to six acres of spawning habitat at two locations in 2014. Each reef will be a bed of 4-8 inch limestone rocks, about two feet thick, 35 feet underwater.

- Harts Light Reef – up to three acres, offshore from East China, MI
- Pointe aux Chenes Reef – up to three acres, offshore from Algonac, MI

St. Clair River Habitat Restoration Projects

St. Clair River Watershed, MI

FUNDING SOURCE: U.S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: EPA, MDEQ

BUDGET: $6 million

START/END DATE: June 2014 - December 2014

There are five habitat projects currently under design. Once these projects are completed and monitored, as well as the other projects that the St. Clair River will be highlighting that are currently under construction, the St. Clair AOC will be able to remove the Loss of Fish and Wildlife Beneficial Use Impairment.

Cuttle Creek Restoration
This project is located on property owned and managed by the City of Marysville and includes an operating public golf course. The project will remove a concrete weir, perched culvert, and an in-line pond. In addition, the project will restore the stream channel through implementation of soft-engineering practices, removal of invasive plant species, re-vegetation of the stream banks with native plant species, enhancement of in-stream habitat, and re-connection of the floodplain to the stream.

Marine City Drain Habitat Improvements
This project includes two areas under the authority of the St. Clair County Drain Commission. The project will restore the shoreline and nearshore areas of the Marine City Drain and St. Clair River at the mouth of the drain and approximately 1,000 feet upstream. In addition, the project will treat invasive Phragmites australis.

Harsens Island Habitat Restoration
This project is located in the delta of the St. Clair River and is within the boundary of the Township of Clay, St. Clair County. This project will dredge portions of the Krispin Drain to re-establish flow and restore tributary habitat within the drain ultimately re-connecting flow to the MDNR managed wildlife lands and will treat Phragmites australis and re-establish native plant vegetation through the drain corridor.

Cottrellville Township St. Clair River Shoreline Restoration
This project will include removal of a vertical steel seawall and restoration of the shoreline and wetland. The western shore of the St. Clair River encompassing approximately two acres of upland and submerged area and 500 linear feet of shoreline. The project will improve native wetland and upland vegetation, fish, macroinvertebrates, and herpetofauna diversity/population.

Port Huron St. Clair River Shoreline Restoration – South
This project is on the western shore of the St. Clair River in Port Huron, Michigan. Containing approximately two acres along approximately 450 linear feet of shoreline, this project will improve stream biodiversity measurements for fish, macroinvertebrates, and herpetofauna diversity/population. Information from the pre- and post-construction monitoring will be used to document this success and reduce erosion and sedimentation.

Port Huron Combined Sewer Overflow Control Program

Port Huron, MI

FUNDING SOURCE: Drinking Water State Revolving Fund, Municipal bonds and a portion of a city paving millage

ENTITY RECEIVING FUNDING: Port Huron

BUDGET: $180 million

START/END DATE: 1997 - ongoing

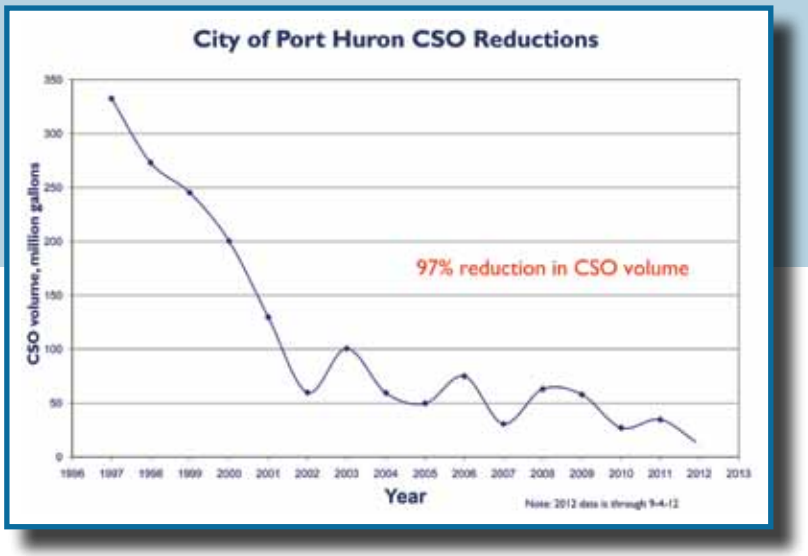
In 1998, the Michigan DEQ ordered the City of Port Huron to undertake separation of combined sanitary and storm sewers. When the project began, 2400 acres of the City were served by combined sewers. By the end of 2012, only 143 acres remain on a combined system. The separation of these sewers has reduced the estimated annual discharge of combined sewage to our rivers by 299 million gallons, which represents a 97% in combined sewer overflow volume.

This work has included the replacement of 59 miles of watermain, installation of 90 miles of sewer, and 77 miles of streets reconstruction.

The City of Port Huron is on-track and under budget to the projected 2016 Combined Sewer Overflow Control Program project completion date.

- *86 miles of sewer replaced or new (36% of City)*
- *No reported basement backup issues during peak weather events due to sewer surcharge (was 100s).*

- *53 miles of water mains have been replaced (32% of city)*
- *25 water main breaks/year (was 125)*



The Nature Conservancy

The Nature Conservancy (TNC) is a non-profit conservation organization that operates in all 50 states and in over 33 countries. Our mission is to conserve the lands and waters on which all life depends. The Nature Conservancy is leading an effort to find, protect and restore the best remnants of the Oak Openings ecosystem in order to preserve a piece of our natural heritage, create green space for people and wildlife and protect special plants and animals of the Lakeplain Oak Openings. The Ohio Chapter of TNC is part of a coalition of conservation partners called the Green Ribbon Initiative (GRI), committed to protecting the natural beauty and biological diversity of the Lakeplain Oak Openings region. The Lakeplain Oak Openings Region is a six county area, extending from approximately, Detroit Metro Airport in Michigan to Maumee State Forest in Ohio. It straddles the Michigan/ Ohio state line, a political boundary that has historically hampered efforts to holistically manage the region's resources. While GRI was originally formed in Ohio, the partnership is currently broadening to include partners from the Lakeplain Oak Openings region of Southeast Michigan.

As part of the GRI, we have completed a Conservation Action Plan (CAP) that describes the problems facing the Lakeplain Oak Openings and addresses how we can work together to address these problems and achieve our conservation goals. Three of the highest priority strategies are invasive species removal, increased controlled burning in fire dependent communities, and increased awareness of the importance of the Lakeplain Oak Openings among private landowners. To identify the highest potential restoration areas, we attracted private funding for a consultant to prepare a GIS-based decision support tool, essentially a computer program that uses scientific data and historical information to create detailed maps that tell us explicitly where to focus our efforts for maximum conservation benefit. These maps identify existing high quality examples and potential high quality examples of each natural community, many of the identified areas being held by private landowners.

Beginning in late fall of 2012 with funding from the National Fish and Wildlife Foundation, we have been making contact with these public and private landowners, offering education and workshops about the importance of their property, identifying habitat restoration capacity issues and, if they desire, helping them to manage that property for the precious natural communities they are capable of supporting. The ultimate goal of our efforts is to connect these existing pieces of Lakeplain Oak Openings together through habitat management at the landscape scale.

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Restoration of Lakeplain Habitat Types at Petersburg State Game Area

Petersburg, MI

FUNDING SOURCE: National Fish and Wildlife Foundation

ENTITY RECEIVING FUNDING: Michigan Sea Grant

BUDGET: $25,000+

START/END DATE: 2012 - 2014

TNC's partnership with MDNR's Wildlife Division toward restoration of lakeplain habitat types at Petersburg State Game Area (PSGA) benefits many at risk species, including the federally endangered Karner Blue Butterfly. Utilizing several restoration techniques, over 100 acres of lakeplain wet prairie and lakeplain oak openings have been restored to an improved ecological condition. TNC contracted with a local chapter of the Ruffed Grouse Society to carry out a large component of the woody species removal, which included hydro-axing of over 80 acres of invasive shrubs and small diameter trees. Also toward woody species removal in the most ecologically sensitive areas, TNC's Interagency Restoration Team utilized hand-operated power equipment to remove trees and brush. To follow up on this work, the Interagency Restoration Team has been methodically gridding each treatment area with a combination of backpack sprayers and a tractor-mounted herbicide wicking boom. Another important and ongoing component of this project is the ecological monitoring of several taxa including herpetiles, birds, insects and vegetation at PSGA, which will provide data on species recovery at the site. Of note, several state-listed plants and insects have been observed in the post-treatment areas at PSGA.

Restoration sequence in an oak openings community threatened by invasive shrub encroachment

Wild lupine flowering in abundance following management activities

Restoration of Lakeplain Habitat Types at Sumpter Township Prairies

Sumpter Twp., MI

FUNDING SOURCE: National Fish and Wildlife Foundation

ENTITY RECEIVING FUNDING: The Nature Conservancy

BUDGET: $35,000+

START/END DATE: 2012 - 2014

Working on land owned by Sumpter Township and ITC Holdings Corp., The Nature Conservancy has implemented or planned restoration management activities on over 300 acres of natural areas in Sumpter Township. To date, nearly 100 acres of rare habitat have been enhanced or restored on these partner lands. Previous floristic quality surveys (circa 1995) have identified natural areas on Sumpter Township lands as some of the highest quality remnant lakeplain habitat remaining in the region. Restoration work performed by contractors and the Interagency Restoration Team has helped the prairie communities recover from the negative impacts of forest succession and invasive species. Of note, several state-listed plants and insects have been observed in the post-treatment areas of Township owned lands.

Trash removal workdays at Sumpter Township Prairies resulted in the removal of over 50 tires and other accumulated debris

Restored lakeplain oak openings at Sumpter Township Prairies

Restoration of Lakeplain Oak Openings

Petersburg, MI

FUNDING SOURCE: National Fish and Wildlife Foundation

ENTITY RECEIVING FUNDING: The Nature Conservancy

BUDGET: $25,000+

START/END DATE: 2012 - 2014

Working on land owned by five contiguous private landowners, The Nature Conservancy is restoring remnant lakeplain oak openings on more than 200 acres of privately-owned land in northwest Monroe County. In addition to the management actions, we are implementing restoration monitoring of birds, herpetiles, vegetation and insects. These sites help to create habitat permeability in the landscape and form our largest contiguous group of private land partners in the Michigan portion of the Lakeplain Oak Openings.

Lakeplain prairie community, post spotted knapweed removal, private land partner in northwest Monroe County

Box turtles are one of the obligate species that benefit from lakeplain oak openings restoration in northwest Monroe County

Restoration of Alvar Prairie Habitat

Whiteford Twp., MI

FUNDING SOURCE: National Fish and Wildlife Foundation

ENTITY RECEIVING FUNDING: The Nature Conservancy

BUDGET: $25,000+

START/END DATE: 2012 - 2014

Working on land owned by Whiteford Township, The Nature Conservancy is restoring a globally rare 14-acre alvar prairie at a community park in southwest Monroe county near Ottawa Lake. Prior to TNC's involvement at the park, this natural area experienced woody plant succession and invasive species colonization. This project also helped to get Whiteford Township to think about natural areas planning as part of their park system. Project highlights included finding new county records for several species of plants, helping plan a trail network to enhance enjoyment of the natural area, and increasing volunteer support at the park.

Restoration sequence in rare alvar prairie remnant

NOAA in the Great Lakes

The National Oceanic and Atmospheric Administration (NOAA) is a federal agency whose mission touches the lives of every American. NOAA in the Great Lakes is committed to working on science-based solutions to the most critical problems facing our coastal areas. From weather warnings to climate forecasts, from Great Lakes research to coastal protection and restoration, NOAA provides products and services that further its mission of science, service, and stewardship.

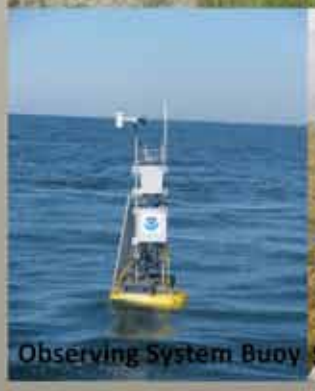
Great Lakes Restoration Initiative

The Great Lakes Restoration Initiative (GLRI), begun in 2010, has provided an infusion of funding for sustainable Great Lakes restoration. NOAA is working in collaboration with other federal agencies, states, NGOs, and local communities to provide maximum return to the region. NOAA's GLRI projects include work in all five GLRI Focus Areas:

- Cleaning up Toxics in Areas of Concern
- Combatting Invasive Species
- Nearshore Health and Nonpoint Pollution
- Habitat Protection and Restoration
- Providing Monitoring and Observations

NOAA is making significant contributions to the restoration of the Great Lakes through the GLRI by expanding and enhancing many existing programs and implementing new innovative projects that address the GLRI Action Plan. Examples of NOAA's GLRI work include habitat restoration in Areas of Concern, developing decision support tools for non-point source pollution, and promoting adaptation to climate change.

Wayne Road Dam Removal Project



Observing System Buoy

Sampling in Lake St Clair

Visit NOAA's Great Lakes region website for more information: www.regions.noaa.gov/great-lakes/

Contact Rebecca.Held@noaa.gov

Great Lakes RESTORATION

Great Lakes Commission

Illinois * Indiana * Michigan * Minnesota * New York
Ohio * Pennsylvania * Wisconsin * Ontario * Québec

Who We Are

The Great Lakes Commission was created by the eight Great Lakes states to promote the orderly, integrated and comprehensive development, use and conservation of the water and related natural resources of the Great Lakes basin and St. Lawrence River. The Commission was established in 1955 by the Great Lakes Basin Compact, is founded in state and U.S. federal law, and includes the Canadian provinces of Ontario and Québec as associate members. Each state is represented on the Commission by a delegation consisting of governors' appointees, state officials or legislators. The Commission's staff is based in Ann Arbor, Michigan.

What We Do

- ***Communication and Education:*** Through the Great Lakes Information Network (www.glin.net) and other tools, the Commission educates and empowers government, citizens and other stakeholders to effectively participate in decisions affecting the future of the region.
- ***Information Integration and Reporting:*** The Commission collects and distributes data and information about the Great Lakes to support effective planning and decisionmaking.
- ***Facilitation and Consensus Building:*** The Commission convenes forums and leads projects to discuss emerging issues, disseminate research, exchange diverse perspectives and build consensus.
- ***Policy Coordination and Advocacy:*** The Commission helps the region speak with a common voice and advocates with Congress and the federal government on behalf of the Great Lakes states on issues of common interest.

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Current Priorities

Building Congressional Support for the Great Lakes Restoration Initiative


photo credit: Great Lakes Fishery Commission

Stopping Asian Carp and other Aquatic Invasive Species

Cleaning Up Areas of Concern and other Degraded Areas


photo credit: James McQuillan

Repairing and Upgrading Water Infrastructure

Preventing Polluted Runoff


photo credit: Rob Rypma

Restoring Fish and Wildlife Habitat


photo credit: Flickr - cseeman

Strengthening Commercial Navigation and Recreational Boating


the Henry Ford
Rosa Parks Bus,
Henry Ford Museum®
Dreamer.
Doer.
Mover.
Maker.
Which are you?
Our 200 acres of invention, inspiration and innovation are a place unlike any other. Mind-blowing collections started by Henry Ford himself. It's where people from all over the world come for unforgettable experiences that make yesterday feel like today—and spark new ideas for tomorrow. Go ahead, have one on us.
Gain perspective. Get inspired.
Make history.
See how you can spark your inner genius at The Henry Ford®.
thehenryford.org/getinspired
Image courtesy of Jason Tester

Southeast Michigan Council of Governments (SEMCOG)

SEMCOG was established in 1968 as a regional planning partnership in Southeast Michigan. We are accountable to local governments who join as members. Membership is open to all counties, cities, villages, townships, intermediate school districts, community colleges, and public universities in Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties.

SEMCOG is also the regionally-designated water quality planning agency under Section 208 of the Clean Water Act. As such, SEMCOG has been involved in water quality and ecosystem restoration activities in Southeast Michigan for years. Specifically, SEMCOG facilitates the Lake St. Clair Protection and Restoration Partnership which developed the Lake St. Clair Strategic Implementation Plan that contains a list of ecosystem restoration projects for the watershed. These include projects that remove beneficial use impairments in the Clinton and St. Clair Rivers.

SEMCOG is also engaged in green infrastructure activities which includes developing a green infrastructure vision for Southeast Michigan as well as assisting the Detroit Water and Sewerage Department in implementing its green infrastructure program. Finally, SEMCOG received Great Lakes Restoration Initiative Funding to implement Green Street projects throughout the AOCs in our region and develop the Great Lakes Green Streets Guidebook.

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Cody Rouge Vacant Land Treatment Program

Detroit, MI

FUNDING SOURCE: Detroit Water and Sewerage Department

ENTITY RECEIVING FUNDING: Greening of Detroit

BUDGET: $25,000

START/END DATE: January 2013 - June 2013

The Greening of Detroit's Vacant Land Treatment Program was a pilot effort to transform vacant lots through the use of green infrastructure. Bringing together funding from the Detroit Water and Sewerage Department (DWSD), planning support from SEMCOG and the Detroit Future City Framework, and with engagement and implementation led by Greening of Detroit and its citizen volunteers, this program is a model for how green infrastructure can be implemented in the City of Detroit.

The Greening of Detroit's Vacant Land Treatment Program is transforming 10 vacant residential property lots in Detroit's Cody Rouge neighborhood. Lots are being treated with four different low-maintenance treatments designed to stabilize and beautify, increase tree canopy, and mitigate stormwater runoff.

Greening of Detroit, SEMCOG, and DWSD led the planning effort. Cody Rouge was identified because of its proximity to the Rouge River and the impact these treatments could have on mitigating stormwater runoff and Combined Sewer Overflows (CSOs). In the Detroit Future City Strategic Framework, Cody Rouge is identified for innovative ecological future land use, which emphasizes the use of green infrastructure.

The planning team led an engagement process with the community to identify the specific sites and treatment plans. Through several meetings, the Cody Rouge residents selected the sites and voted for one of the following treatments for each site: low-grow prairie grass, perennial wildflower mix, a rye grass and wildflower combination, or tree planting.

The estimated storm water runoff could be reduced by 10,000 gallons for a two-year event (2.25 inches), which represents a 30% reduction over approximately 1.2 acres (10 lots). Depending on the treatment, 25-50% runoff reduction can be achieved.

Lake St. Clair Habitat Evaluation Study

Communities within 10 Miles of Lake St. Clair, MI

FUNDING SOURCE: Michigan Coastal Zone Management Program

ENTITY RECEIVING FUNDING: Macomb County Department of Planning and Economic Development

BUDGET: $52,500

START/END DATE: January 2010 - September 2012

This study was written to serve as a tool for implementing the *St. Clair River and Lake St. Clair Comprehensive Management Plan*. The Management Plan contains 110 recommendations for protecting, restoring and enhancing Lake St. Clair including: *Develop a habitat strategy to protect and restore and maintain natural, physical and biological diversity and identify priority habitat areas for restoration and conservation.*

The purpose of the study is to identify, protect and restore the last remaining high ecological value habitat that can serve both an environmental benefit to the watershed as well as benefiting the local economy through ecotourism. The study also identifies projects that are plausible or have a significant chance of being funded through the Army Corps Aquatic Ecosystem Restoration Program, Great Lakes Restoration Initiative, or other state and federal funding sources.

This study was developed in partnership with Macomb County Planning and Economic Development, Michigan Natural Features Inventory (MNFI) and SEMCOG. These entities worked with stakeholders throughout the watershed to identify priority areas, called Socially Significant Sites. These sites were important to local communities for the recreational and ecotourism opportunities they could provide.

The Socially Significant Sites were determined through assessment of Potential Conservation Areas for Macomb and St. Clair counties that were mapped by the MNFI. In comparing Socially Significant Sites and Potential Conservation Areas, 10 terrestrial sites and six aquatic sites were identified for on-the-ground assessment by scientists at Michigan Natural Features Inventory. The study contains summaries of each specific site assessed to be utilized as a first step in identifying and implementing these specific habitat protection and restoration projects.

Floodplain Forest, Clinton River

Lake Plain Prairie, Harsens Island

Restoring the Lake Erie Corridor Through Green Streets

Oakland, Macomb, Monroe and Wayne Counties, MI

FUNDING SOURCE: U.S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: SEMCOG with $100,000 to each County

BUDGET: $500,000

START/END DATE: 2010 - 2013

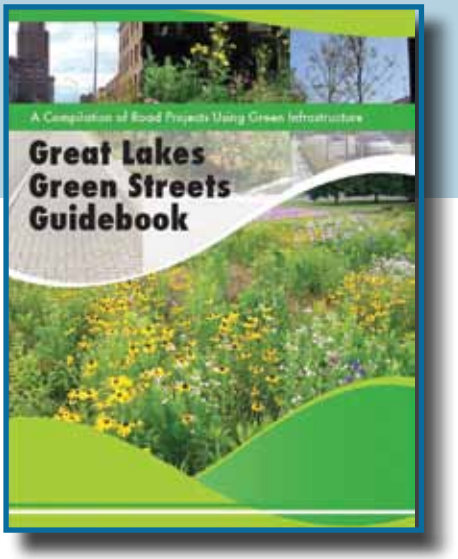
Restoring the Lake Erie Corridor through Green Streets is a grant-funded project that is part of the GLRI through the United States Environmental Protection Agency. SEMCOG was awarded this $500,000 grant to facilitate construction of green infrastructure along roadways by passing through funding to four (4) SEMCOG members, including Macomb County, Monroe County, Oakland County and Wayne County. Outcomes of this project included construction of approximately 30 acres of green infrastructure techniques managing over 160 acres of urban areas, primarily roadways. Techniques include bioretention, native plant grow zones and tree planter boxes.

County Subrecipient	Regional Green Streets Project
Macomb County	Metropolitan Parkway bioswale/grow zones
Monroe County (City of Luna Pier)	Luna Pier Boulevard bioretention
Oakland County	Campus-wide native plant grow zones
Wayne County	Ecorse Road and Morton Taylor Road grow zones

These projects combined reduced annual sediment and total phosphorus loading to local streams by more than 30,000 pounds and 50 pounds respectively. Additionally, the quantity of annual storm water runoff is reduced by over 20 million gallons.

An additional outcome included the development of the Great Lakes Green Streets Guidebook presenting case studies of varying approaches to managing storm water runoff from roads. Twenty-six (26) projects across the Great Lakes are included in this guidebook and include techniques such as bioretention, permeable pavement and native plant grow zones.

Oakland County Sustainable Green Streets Campus before construction



Guidebook cover

Oakland County Sustainable Green Streets Campus after construction

Shaping the Future of the Great Lakes

ECT

Environmental Consulting & Technology, Inc.

Environmental Consulting & Technology, Inc. (ECT) is a natural resource engineering and scientific services organization with nine Midwest regional offices that support responsible municipalities, industries, and local stakeholders throughout the Great Lakes basin states. ECT represents dozens of citizen advisory councils, nonprofits and other non-governmental organizations and has guided our partners in establishing restoration/delisting targets for a large number of U.S. Areas of Concern and in developing blueprints to restore fish/wildlife habitat and population-related beneficial use impairments. Beyond planning, ECT designs and implements major natural resource restoration projects throughout the Midwest. ECT's unique local know-how, coupled with its national reach, has often been used to help our partners obtain and leverage the funding required to support complex and cost-limiting projects. To date ECT has successfully brought over $70 million to our clients seeking to construct natural resources projects.

Under the Great Lakes Restoration Initiative, ECT has earned a reputation for providing exceptional technical expertise in the areas of water resource restoration and natural resource management, and has a proud history of forming partnering relationships with a variety of national firms to help address many of the larger-scale watershed initiatives throughout the Great Lakes basin, including Battelle, the Mission Support Contractor for the U.S. Environmental Protection Agency's Great Lakes National Program Office, and EQM, holder of the Great Lakes Legacy Act Construction Services Contract.

Natural Resources Experience

Development of delisting/restoration targets
Contaminated sediment design and removal
Lake level management and restoration
Streambank stabilization
Development of natural resource restoration policy/planning
Hydraulics, hydrology and water quality modeling
Green infrastructure and low impact design
Assistance in grant harvesting
Public education, outreach and facilitation
NPDES storm water compliance
Hazardous materials management

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Midwest Offices

Ann Arbor, Benton Harbor, Clinton Twp., Detroit, Flint, Lansing, and Traverse City - Michigan

Chicago - Illinois
Iowa City - Iowa
Minneapolis - Minnesota

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Belle Isle South Fishing Pier and Blue Heron Lagoon Habitat Enhancement and Restoration in Detroit, Michigan

Transforming the Rouge AOC from Mowed Down to Grown Up - Green Infrastructure Improvement in Southeast Michigan

Wayne Road Dam Removal and Habitat Improvement in Wayne, Michigan