GREAT LAKES RESTORATION

Celebrating our Accomplishments
Celebrating the Future in Southeast Michigan

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

GREAT LAKES RESTORATION
October 18, 2019
The Henry Ford

October 18, 2019
The Henry Ford

Hosted by:

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

Cover photos:

Left column from top to bottom: Main Branch of the Clinton River in Rochester Hills; Lower Rouge Trail along the Rouge River in Canton and kayaking by Belle Isle in the Detroit River in Detroit.

Middle column: View of the mouth of the Kawkawlin River and Saginaw Bay in Bay City (photo credit - Larry Peters).

Right column from top to bottom: St. Clair River at Chrysler Beach in Marysville; River Raisin from the Raisinville Rd. bridge in Monroe; and Huron River in Dexter (photo credit - Marc Akemann)

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

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. Six areas in Southeast Michigan - the Rouge River, the Detroit River, the Clinton River, the River Raisin, the St. Clair River, and the Saginaw River are designated as Areas of Concern (AOC) because of their history of contamination. The restoration of these historically contaminated areas, as well as efforts on the Huron River, Kawkawlin River and the region in general, have been led by numerous watershed groups that are being celebrated today. 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 projects funded through the U.S. Environmental Protection Agency (USEPA), Great Lakes Restoration Initiative (GLRI), the National Oceanic and Atmospheric Administration (NOAA), the Forest Service and others.

We welcome our congressional delegation and sincerely thank them for their continued support of the GLRI. By assuring that the resources are available to continue the restoration they have allowed us all to restore our Great Lakes. Our federal and state leaders continue to provide the technical and financial support to be able to complete these large scale restoration efforts. We must also extend a special thanks to the counties, municipalities, non-governmental organizations (NGOs) and other community groups for their continued efforts to restore our region. They are the backbone of this massive effort.

Partners in this endeavor include:

- Alliance of Rouge Communities
- The Henry Ford
- Rouge River Advisory Council
- Michigan Department of Environment, Great Lakes and Energy
- Clinton River Watershed Council
- Southeast Michigan Council of Governments
- National Oceanic and Atmospheric Administration
- Great Lakes Restoration Initiative
- Friends of the Detroit River
- Friends of the St. Clair River
- Detroit River Public Advisory Council
- Alliance of Downriver Watersheds
- Friends of the Rouge
- River Raisin Watershed Council
- Great Lakes Commission
- Lenawee Conservation District
- U. S. Environmental Protection Agency
- USEPA Great Lakes National Program Office
- Wayne County Department of Public Services
- Kawkawlin River Watershed Association
- Detroit River Canadian Cleanup
- Michigan Sea Grant
- Huron River Watershed Council
- Fred A. and Barbara M. Erb Family Foundation
- St. Clair River Binational Public Advisory Council
- City of Monroe's Commission on the Environment and Water Quality/ River Raisin AOC
- American Public Works Association

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SEPTEMBER 2018

Restoring the Great Lakes

The Great Lakes Restoration Initiative was launched in 2010 to restore and protect the lakes. Congress appropriated $2.5 billion from 2010 to 2017 to fund more than 3,600 projects that have dramatically improved environmental conditions around the region.

Over the past eight years, the GLRI has been celebrated for the progress it has made toward restoring and protecting the Great Lakes. Six million pounds of invasive Asian carp have been trapped and removed from the Illinois River, more than 402,000 pounds of phosphorus have been prevented from running into the lakes, and more than 180,000 acres of fish and wildlife habitat have been protected or restored. The most environmentally sensitive and damaged areas are being cleaned up and toxic residue is being removed from the lakes. These accomplishments have resulted from the unparalleled partnerships between the U.S. federal government, states, cities and towns, tribes, businesses, and nonprofit organizations that the GLRI set in motion.

Every GLRI project dollar spent 2010-2016:

- **Will produce $3.35 of additional economic activity through 2036**
- **Will generate $1.62 in additional economic activity in tourism-related industries through 2036**
- **Produced quality of life improvements worth $1.08 to residents in coastal communities**

Great Lakes RESTORATION

Economic impact of Great Lakes restoration

Despite strong anecdotal evidence that the GLRI helped turn the economy around in many Great Lakes communities, until recently there was no comprehensive study of the overall impact of the program on the regional economy. A team of Great Lakes organizations worked with the University of Michigan's Research Seminar in Quantitative Economics to analyze the economic impacts of funding provided by the GLRI between 2010 and 2016, the amount of region-wide economic activity that has been and will be triggered by GLRI investment through 2036, the growth in regional tourism that has resulted due to

the GLRI, and the impact of the program on the region's quality of life as reflected in home values. The research was reviewed by a panel of economists and other experts from outside the Great Lakes region. In addition, to provide local context for the results, the team developed case studies that describe how regional impacts have translated into real improvements in eight Great Lakes coastal communities.

The team found that **every dollar of GLRI project spending from 2010 through 2016 will produce $3.35 of additional economic activity in the Great Lakes region through 2036.** The number was even higher in some Great Lakes communities: each dollar invested in Buffalo, New York, and Detroit will produce more than $4 of additional economic activity. The study also shows **that the GLRI has enhanced tourism in the Great Lakes region**. Every dollar of GLRI project spending from 2010 through 2016 will generate $1.62 in economic value in tourism-related industries through 2036. Additionally, the study found **that the GLRI increased the value that residents place on living coastal areas**: every project dollar spent between 2010 and 2016 produced quality of life improvements in coastal communities worth $1.08 to residents as measured in housing values, which means that people place a higher value on living in those communities because of GLRI projects. Finally, research shows that, despite being envisioned as an environmental program, **the GLRI created or supported as many jobs per dollar of investment that would be created by a conventional federal stimulus program**.

The case studies illustrate how the regional impact of the GLRI has translated into local improvements in specific Great Lakes communities. They showed that the GLRI has led to significant new real estate and commercial development, particularly in waterfront areas; a resurgence in traditional water-based recreation and the emergence of a new type of tourism focused on kayaking, kitesurfing, and paddle-boarding; improved quality of life, as indicated by willingness to pay more for housing in coastal areas; and increases in the number of young people who are choosing to stay in or relocate to Great Lakes communities.

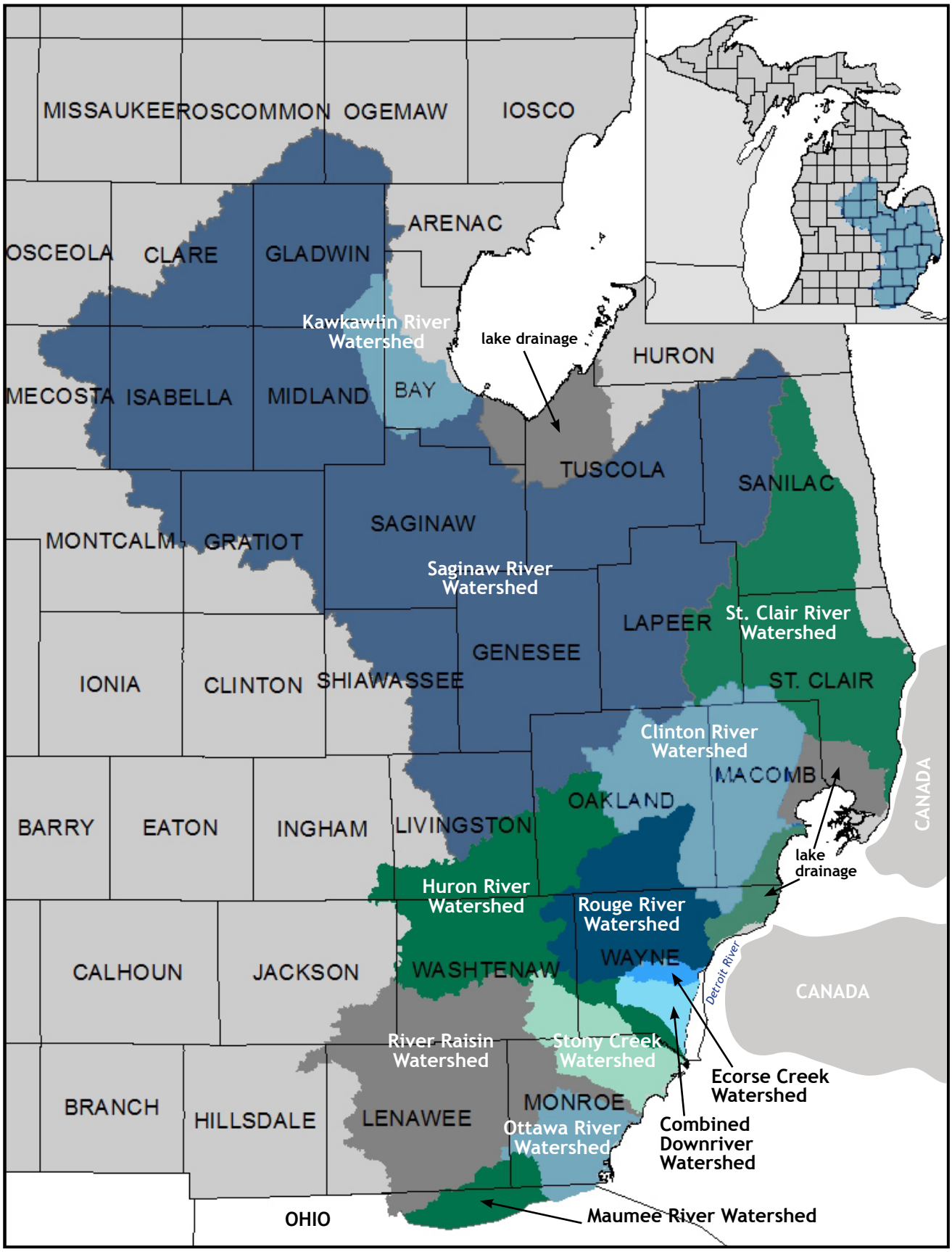
The team

Research was led by the University of Michigan's Research Seminar in Quantitative Economics and overseen by a panel of economists and other experts from outside the Great Lakes region. The case studies were developed by the Issue Media Group. A team led by the Great Lakes Commission and the Council of Great Lakes Industries coordinated the study. The team included the Alliance for the Great Lakes, the National Wildlife Federation's Great Lakes Regional Center, the Great Lakes Metro Chambers Coalition, Michigan's Office of the Great Lakes, and the University of Michigan's Water Center. A panel of Great Lakes stakeholders provided advice and guidance on the scope of the project and helped articulate the outcomes.

Funding for this project was provided by the Charles Stewart Mott Foundation, the Fred A. and Barbara M. Erb Family Foundation, the Joyce Foundation, the Wege Foundation, the Fund for Lake Michigan, Michigan Department of Natural Resources' Office of the Great Lakes, and the Pennsylvania Department of Environmental Protection's Office of the Great Lakes.

Great Lakes Commission des Grands Lacs

Southeast Michigan Watersheds



Michigan's Invasive Species Program
is a joint effort of
Michigan Departments of Natural Resources;
Environment, Great Lakes, and Energy;
and Agriculture and Rural Development

These departments share responsibility for invasive species policy, legislation, regulation, education, monitoring, assessment, management and control

Michigan's invasive species program priorities

- Blocking Invasive carp from entering the Great Lakes Basin through the Chicago Area Waterway System.
- Preventing the movement of aquatic Invasive species via ballast water discharges from ships.
- Stopping the movement of invasive species through trade routes including the sale of living organisms as food, bait, pets, food markets, and nursery stock.
- Preventing the movement of invasive hitchhikers through firewood, packaging material, and recreational activities like boating.
- Detecting and responding to new invasive species like Hemlock wooly adelgid, red swamp crayfish, and parrot feather.
- Controlling widespread species like Phragmites, Japanese knotweed, and Eurasian watermilfoil.

Program website, including annual report, species identification and more:
mi.gov/invasives

Reporting:
misin.msu.edu

Social media:
#notMispecies

Grants:
mi.gov/misgp

Alliance of Rouge Communities

The Alliance of Rouge Communities (ARC) is a non-profit voluntary public watershed entity currently comprised of 35 municipal governments (i.e. cities, townships and villages), three counties (Wayne, Oakland and Washtenaw), Henry Ford College, University of Michigan-Dearborn, the Wayne County Airport Authority and the following Cooperating Partners: Friends of the Rouge, Cranbrook Institute of Science, Great Lakes Water Authority, SEMCOG, Southeastern Oakland County Water Authority, Rouge River Advisory Council and The Henry Ford.

Founded in 2005, the ARC is funded by membership dues from local governments and supported by grants. The purpose of the ARC is to provide an institutional mechanism to encourage watershed-wide cooperation and mutual support to meet water quality requirements mandated by the state's stormwater permit and to restore beneficial uses to the Rouge River such as canoeing, fishing and other recreational activities for area residents.

In addition, the ARC has received almost $16 million in federal and state grants to create habitat, improve fish passage, restore tree canopy and monitor water quality improvements in the watershed.

Other activities conducted by the ARC include:

- **Monitoring:** Water quality monitoring throughout the river which helps gauge the health of the river.
- **Elimination of Pollutant Sources:** Coordinate and conducts illicit discharge elimination efforts that have successfully eliminated millions of gallons of sewage from the Rouge River.
- **Green Infrastructure:** Conducts public workshops on creating and maintaining rain gardens, septic system maintenance, caring for land along rivers and promoting stewardship activities.
- **Public Education:** Develops and disseminates watershed educational brochures, posters, and giveaways including pet waste containers promoting picking up after your pet and garden kneeling pads promoting the use of native trees and plants. ARC communities have distributed thousands of tree seedlings and black-eyed susan seeds to schools and residents at community events.
- **Rouge River Advisory Council (RRAC) Support:** The ARC acts as the fiduciary of state funds to support the RRAC. It also runs the general business activities and assisted in the development of the Rouge Area of Concern (AOC) Habitat Project list for the removal of the Habitat Beneficial Use Impairments (BUIs.)

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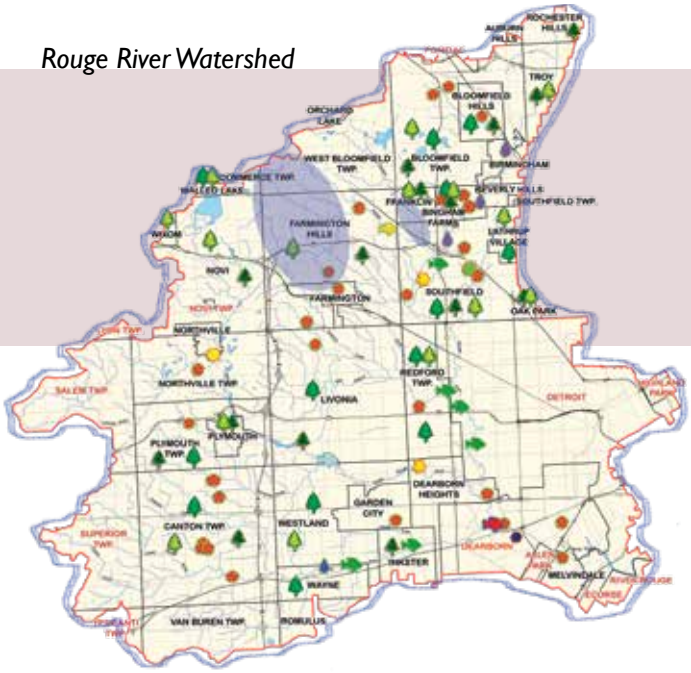
Rouge River Watershed



* *Area Of Concern (AOC) project which benefits entire watershed & is a designated project to remove BUIs and eventually delist the Rouge as an AOC*

BLACK TEXT - ARC Members *RED TEXT - Non ARC Members*

Johnson Creek Fish Hatchery Park Habitat Restoration

Northville & Northville Twp., MI

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

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities

BUDGET: $1,173,176

START/END DATE: 2018 - 2021

The Alliance of Rouge Communities (ARC) received grant funding from the Great Lakes Restoration Initiative (GLRI) U. S. Environmental Protection Agency (USEPA) for the Johnson Creek – Fish Hatchery Park Habitat Restoration design and implementation project as part of its effort to restore the only remaining cold-water fishery in the Rouge River.

The Rouge River watershed is a designated Area of Concern (AOC) under the Great Lakes Water Quality Agreement (GLWQA) and has three Beneficial Use Impairments (BUIs) associated with fish and wildlife habitat: Degraded Fish and Wildlife Populations, Degradation of Benthos, and Loss of Fish and Wildlife Habitat. The Rouge River Advisory Council (RRAC), the Public Advisory Council (PAC) for the Rouge AOC, in March 2016 approved a list of projects that need to be completed to remove the Rouge AOC habitat BUIs. The Johnson Creek Fish Hatchery Park Habitat Restoration Project is considered to have a significant impact on the removal of the BUIs.

The only public access point to Johnson Creek is Fish Hatchery Park, which was the first registered fish hatchery in the nation. Fish and wildlife habitat associated with Johnson Creek have been lost and impacted by sedimentation, loss or conversion of riparian vegetation, and streambank armoring, reducing its viability as a cold-water fishery (the only one remaining in the Rouge River). A spring-fed pond, which flows into Johnson Creek, has been degraded by sediment-laden stormwater runoff from the unimproved parking lot at Fish Hatchery Park. The resulting sediment has been deposited into the pond to a point where it is less than 18 inches deep. This sediment escapes from the pond through the outlet structure and is impairing the stream bottom habitat in Johnson Creek. In addition to this, streambanks in the park have been impacted by the removal of native vegetation and historic placement of a concrete wall.

To address this concern and to restore the habitat in Johnson Creek, the project naturalizes the streambanks, removes accumulated sediment in the pond, modifies the pond outlet to create a fish passage channel between the pond and the creek, and installs a vegetated bioswale to improve water quality of runoff. In addition to these improvements, the project includes the planting of over 250 native trees and over 300 native shrubs.

Existing concrete wall channelizing creek

Existing pond conditions

Restoring Tree Canopy in the Rouge River AOC

Rouge River Watershed, MI

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

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities

BUDGET: $374,980 awarded in 2012, $100,000 in 2014, $100,000 in 2017

START/END DATE: 2011 - 2019

In 2012 the Alliance of Rouge Communities (ARC) was awarded a GLRI-USDA Forest Service grant for $374,980 that sought to replace more than 2,500 trees to the Rouge River Watershed, which lost thousands of trees due to the Emerald Ash Borer (EAB) since 2002. In 2014 and 2017 the GLRI USDA Forest Service awarded two subsequent grants to the ARC in the amount of $100,000 each to plant a total of 1,360 new trees and create a healthy, functional and more diverse urban tree canopy in the Rouge River Watershed. These grants planted more than 3,800 trees in 21 communities and Wayne County. These tree plantings aide in reducing the effects of air and stormwater pollution (including soil erosion) and the effects the pollution has on habitat.

Tree planting is a priority project in the Rouge River AOC BUI Delisting Strategy (2012). The watershed is a high to medium priority area for EAB according to the State Forest Action Plan and these projects helped address the plan's Issue 9: Reforestation of Urban and Ex-Urban Areas. The approach for restoration has evolved from merely improving water quality to maximizing ecological integrity within the AOC.

The ARC member partners for the 2012 grant include: Bingham Farms, Bloomfield Hills, Bloomfield Township, Canton Township, Lathrup Village, Livonia, Plymouth Township, Redford Township, Southfield, Walled Lake, Wayne, Westland and Wayne County.

The ARC member partners for the 2014 grant include: Bingham Farms, Bloomfield Township, Canton Township, Inkster, Novi, Oak Park, Plymouth, Plymouth Township, Rochester Hills, Southfield, Troy, Village of Franklin, and Wayne County.

The ARC member partners for the 2017 grant include: Bingham Farms, Bloomfield Township, Canton Township, Farmington Hills, Lathrup Village, Novi, Oak Park, Plymouth, Redford Township, Southfield, Troy, Village of Franklin, Walled Lake, Westland, Wixom and Wayne County.

The three grants combined, based on the trees species selected and using I-Tree Design analysis, result in an estimated total benefit of $35,906.49 per year from energy, carbon dioxide (CO_2), air quality, stormwater and aesthetic benefits. Additionally, approximately 120,297 gallons of rainfall each year will be intercepted by the trees from the three combined grants reducing stormwater pollution.

Tamarack Creek Stream & Wetland Habitat Restoration

Southfield, MI

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

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities

BUDGET: $2,718,183

START/END DATE: 2018 - 2021

The Alliance of Rouge Communities (ARC) received grant funding from the Great Lakes Restoration Initiative (GLRI) U. S. Environmental Protection Agency (USEPA) for design and construction of the Tamarack Creek Stream & Wetland Habitat Restoration Project as part of its effort to restore habitat and improve the water quality in the Rouge River watershed.

The Rouge River watershed is a designated Area of Concern (AOC) under the Great Lakes Water Quality Agreement (GLWQA) and has three Beneficial Use Impairments (BUIs) associated with fish and wildlife habitat: Degraded Fish and Wildlife Populations, Degradation of Benthos, and Loss of Fish and Wildlife Habitat. The Rouge River Advisory Council (RRAC), the Public Advisory Council (PAC) for the Rouge AOC, in March 2016 approved a list of projects that need to be completed to remove the Rouge AOC habitat BUIs. The Tamarack Creek Stream & Wetland Habitat Restoration Project is considered to have a significant impact on the removal of the BUIs.

Tamarack Creek is a tributary of Evans Creek and the Middle Rouge River. As much of its drainage area is urbanized, it receives large quantities of uncontrolled stormwater runoff. The high channel velocities caused by large peak flows have led to bank erosion and sedimentation of instream habitat. Additionally, excessive velocity is destabilizing substrates that are important for fish and macroinvertebrate habitat. The Tamarack Creek Stream and Wetland Restoration project addresses these habitat impairments and increases fish and wildlife diversity and productivity.

In order to address the habitat impairments, restoration of the creek is necessary in conjunction with wetland restoration to help improve hydrology and in-stream flows. Wetland restoration will include the repair of wetland hydrology, management of invasive species, and planting native wetland plants to diversify the flora. An outlet structure will be constructed to increase storage capacity within the wetland and to allow water from the wetland to drain slowly into Tamarack Creek. The stream habitat will be restored by expanding the floodplain to allow Tamarack Creek to convey larger stormwater flows without causing excessive velocities and destabilizing substrate. The new floodplain will be planted with native plants and trees, which will add wildlife habitat diversity and value. The banks and stream bed will be further stabilized with woody debris habitat structures.

Existing stream conditions

Existing wetland conditions

Seeley Creek Habitat Restoration

Farmington Hills, MI

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

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities

BUDGET: $815,000

START/END DATE: 2019 - 2021

During the last century, tributaries of the Rouge River, like Seeley Creek, have suffered from declining water quality, loss and impairment of aquatic habitat, and increased frequency and magnitude of peak flood flows, primarily due to increasing urbanization within the watershed. Upstream urbanization, increasing the amounts of impervious surfaces culminating in floods within downstream local communities, has caused the habitat value within the Rouge River to drastically decline. In an effort to address the habitat value a series of restoration projects were developed in 2016 including the Seeley Creek Restoration project.

In 2008 a morphological monitoring and assessment showed that a portion of Seeley Drain was morphologically unstable due to entrenchment, and that habitat diversity was low due to a lack of coarse substrates, lack of stable woody debris, and lack of pool habitat. Based on this assessment, the project will design the drain to resection the upstream portion to create natural bankfull dimensions and floodplain terraces on one or both sides of the drain. Resectioning the channel will reduce channel velocity and erosive forces, resulting in more stable banks, less sediment loading, and more stable aquatic habitat. After resectioning, the channel and flood terraces will be stabilized using native vegetation and bioengineering practices.

The design intends to include the addition of grade control structures using coarse river aggregates to control bed erosion, create pool habitat, and add coarse substrates. Grade control structures such as artificial riffles would result in increased habitat diversity by directly adding coarse substrates, promoting natural sediment sorting (creating deposits of coarse debris), increasing flow velocity heterogeneity, and creating pool habitat. Furthermore, they will improve the overall stability of aquatic habitats by reducing flow energy and bed/bank erosion.

In addition, restoration of two riparian wetland areas totaling approximately 5 acres will be designed and implemented. Both wetlands have been impaired by hydrological alteration and invasive species colonization. Erosional gullies have formed through the wetlands, which is promoting their drainage, decreasing their hydroperiod, and encouraging loss of native vegetation and establishment of invasive species. It also impairs their water quality function by preventing or reducing naturally filtering processes. To restore the wetlands, the gullies will be filled, and stabilized, invasive species will be treated and managed using the most effective means available, and native wetland species will be planted.

The Seeley Creek Restoration project when fully implemented will produce:

- 5 acres of invasive plant species management and wetland restoration
- 30+ control riffles
- 4,000 feet of restored/improved stream habitat

Example of floodplain terraces

Example of grande control structures using coarse river aggregates

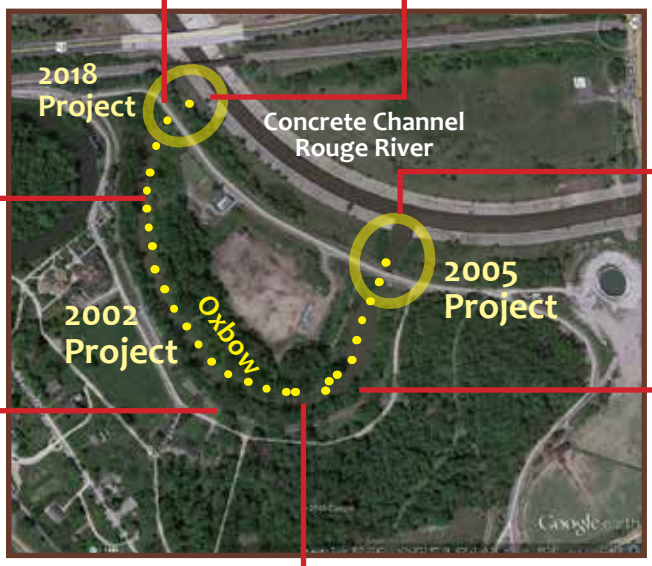
Celebrating the Grand Opening of the Rouge River Oxbow 2000 ~ 2019

Project Partners Include: Wayne County Department of Public Services, the Henry Ford, Alliance of Rouge Communities, OURS TO PROTECT

Oxbow reconnected to Rouge River

Removal of concrete channel

Channel restoration using bioengineering techniques



Construction of southeast open cut to Rouge River

Completed channel restoration

Completed southeast open cut to Rouge River

Project signage viewable by visitors to The Henry Ford

Channel construction

Adult brown snake found during herpetology survey

Funding provided by: Wayne County Department of Public Services, United States Environmental Protection Agency, NOAA, Great Lakes Restoration, The Rouge River Project A World Class Effort — Bringing Our River Back to Life, Clean Michigan Initiative CMI

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 Michigan Department of Environment, Great Lakes, and Energy (EGLE) 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 stormwater 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). Since that time, RRAC continues to support and advocate for activities in the Rouge AOC that will benefit the AOC and the large population within it boundaries. RRAC is a visible member at the annual AOC and SPAC meeting, sharing its lessons learned. Recently RRAC focused time and effort on developing the final management action Rouge AOC Habitat Project list for the removal of the Habitat BUIs.

Contact Information:
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ROUGE RIVER AREA OF CONCERN (AOC)
PROJECTS NEEDED TO REMOVE THE HABITAT BUIs

BRANCH	MAP ID	PROJECT NAME	PROJECT STATUS	COST ESTIMATE
MAIN	A	Valley Woods Wetland Restoration	PROJECT COMPLETE	
	H	Elise Grandi & River Rouge Parks Habitat Improvements	PROJECT COMPLETE	
	B	Tamarack Pond Dam Removal and Stream Restoration	PROJECT COMPLETE	
	C	Rouge Oxbow Restoration	PROJECT COMPLETE	
	D	Carpenter Lake Restoration	PROJECT COMPLETE	
	E	Kingfisher Bluff Restoration	PROJECT COMPLETE	
	F	Tonkawa Island Marine Debris Removal	PROJECT COMPLETE	
	I	Tonkawa Island and Upland Habitat Restoration (Phase I & II)		$2,560,000
	J	Patton Park Wetland Restoration		$900,000
	M	Rouge Oxbow Restoration Phase 3	PROJECT COMPLETE	$2,411,310
	O	Henry Ford Estate Dam Fish Passageway	IMPLEMENTATION IN PROGRESS	$2,753,600
	P	Tamarack Creek Stream and Wetland Restoration	IMPLEMENTATION IN PROGRESS	$1,758,500
	Q	CSO Wetland Restoration		$539,000
	R	Fire Fighters Park Sprague Stream Improvements		$600,000
TOTAL FOR MAIN BRANCH				$11,519,585
UPPER	L	Lola Valley Park Habitat Improvements	PROJECT COMPLETE	
	S	Lola Valley Park Wetlands	DESIGN IN PROGRESS	$850,000
	U	Bell Creek Park Wetlands	DESIGN IN PROGRESS	$600,300
	V	Seeley Creek Restoration		$815,000
TOTAL FOR UPPER BRANCH				$2,918,300
MIDDLE	Z	Newburgh Lake Restoration	PROJECT COMPLETE	
	A	Wayne County Parks Property Habitat Improvements	PROJECT COMPLETE	
	B	Merriman Hollow Wetland & Grow Zone		$396,900
	W	Pierce Park Wetlands & Reforestation		$864,000
	BB	Wallacetta West Wetland		$268,600
	P	Rankin Lake Restoration	IMPLEMENTATION IN PROGRESS	$1,716,850
	EE	Riverview Park Wetlands		$2,186,000
	GG	Willow Lake Habitat Improvements		$1,092,700
	HH	Phoenix Lake Habitat Improvements		$990,000
	II	Johnson Creek Fish Habitat Park Habitat	IMPLEMENTATION IN PROGRESS	$1,171,176
	JJ	Newburgh Park Wetland	DESIGN IN PROGRESS	$700,000
	KK	Johnson Intercounty Drain Restoration		$1,995,000
TOTAL FOR MIDDLE BRANCH				$14,960,800
LOWER	L	Inkster CSO Basin Habitat Improvements	PROJECT COMPLETE	
	M	Venoy Park Habitat Improvements	PROJECT COMPLETE	
	G	Wayne Road Dam Removal and Stream Restoration	PROJECT COMPLETE	
	LL	Inkster Park Wetlands & Fish Habitat Structures		$944,000
	MM	Venoy Wetlands & Fish Habitat Structures		$870,000
	NN	Colonial Park Wetland & Reforestation		$908,900
	OO	Lower Rouge River Habitat Restoration	DESIGN IN PROGRESS	$1,000,000
TOTAL FOR LOWER BRANCH				$4,700,900
VARIOUS BRANCHES	QQ	Cross Case Retrofits		$800,000
U. S. ARMY CORPS OF ENGINEERS	RR	Concrete Channel Modifications/Enhancements with Enhanced Connection Oxbow and Michigan Ave./Evergreen Rd Stormwater Treatment and Habitat Restoration		TBD
GRAND TOTAL FOR ALL BRANCHES				$33,599,685

Rouge River Watershed Initiatives

Rouge River Watershed, MI

FUNDING SOURCE: Michigan Department of Natural Resources AOC Program

ENTITY RECEIVING FUNDING: Alliance of Rouge Communities

BUDGET: $145,032 (five grants)

START/END DATE: 2014 - 2019

Rouge River Area Of Concern (AOC) – Habitat Restoration Project List Development (2014-2019) The Rouge River Advisory Council (RRAC) formally developed the Rouge River AOC Habitat Restoration Projects List. This list includes projects that have been completed and ones that will need to be completed in order to achieve the associated goal of fish and wildlife habitat and fish and wildlife population's beneficial use impairments (BUI) removal. RRAC's Habitat Committee reviewed and made recommendations on projects and received RRAC membership acceptance of the habitat list. In 2018 RRAC received approval from both the State of Michigan and the U. S. Environmental Protection Agency as the official list of habitat restoration management actions required to remove the habitat BUIs in the Rouge River AOC.

Rouge River AOC– Facilitation, Habitat, & Fish (2016 -2019) This grant continued general business activities, development of habitat project descriptions, and sampling for fish in the Rouge River AOC along with the general business activities include the support and facilitation of RRAC meetings, maintaining the RRAC website, and other administrative duties. This grant also developed more in-depth project description sheets for the Rouge AOC Habitat Restoration List Projects. It continued the work to characterize the Rouge fish community by completing surveys of the Upper and Main Rouge and compiling all of the fish community data that Friends of the Rouge has collected since 2012. This information could lead towards delisting portions of the Rouge River no longer impaired for fish.

KEY:

- PROJECT REQUIRING FUNDING FOR DESIGN, CONSTRUCTION OR BOTH:

1. Fordson Island and Upland Habitat Restoration (1 & 2)
2. Patton Park Wetland Restoration
3. LTU Wetland Restoration
4. Fire Fighters Park Sprague Stream Improvements
5. Lola Valley Park Wetlands
6. Bell Creek Park Wetlands
7. Seeley Creek Restoration
8. Merriman Hollow Wetland & Grow Zone
9. Perrin Park Wetlands & Reforestation
10. Wallaceville West Wetland
11. Riverview Park Wetlands
12. Wilcox Lake Habitat Improvements
13. Phoenix Lake Habitat Improvements
14. Sherwood Park Wetland
15. Johnson Intercounty Drain Restoration
16. Inkster Park Wetlands & Fish Habitat Structures
17. Venoy Wetlands & Fish Habitat Structures
18. Colonial Park Wetland & Reforestation
19. Lower Rouge River Habitat Restoration
20. Various Grow Zones Retrofits
21. Army Corps Project - Concrete Channel Modifications/Enhancements with Oakwood Commons Oxbow & Michigan Ave./Evergreen Rd. Stormwater Treatment & Habitat Restoration

- COMPLETED PROJECT OR PROJECT THAT REQUIRES NO ADDITIONAL FUNDING:

A. Valley Woods Wetland Restoration
B. Danvers Pond Dam Removal and Stream Restoration
C. Rouge Oxbow Restoration
D. Carpenter Lake Restoration
E. Kingfisher Bluff Restoration
F. Fordson Island Oxbow Debris removal and Habitat Restoration Project
G. Wayne Road Dam Removal and Stream Restoration
H. Eliza Howell & River Rouge Parks Habitat Improvements
I. Lola Valley Park Habitat Improvements
J. Newburgh Lake Restoration
K. Wayne County Parks Property Habitat Improvements
L. Inkster CSO Basin Habitat Improvements
M. Venoy Park Habitat Improvements
N. Rouge Oxbow Phase 3
O. Henry Ford Estate Dam Fish Passageway
P. Nankin Lake Restoration
Q. Johnson Creek Fish Hatchery Park Habitat
R. Tamarack Creek Stream and Wetland Restoration

Wayne County Department of Public Services
Environmental Services Division

The mission of the Wayne County Department of Public Services – Environmental Services Division (ESD) is to protect Wayne County's land and water resources through the implementation of its solid waste management, soil erosion and sedimentation control, drains maintenance and wastewater operations programs. ESD works with local and regional municipalities, other Wayne County departments and residents so they can achieve timely and cost-effective compliance with water quality regulations. These efforts help improve quality of life and provide water resources that are safe for drinking and recreation.

The ESD works to protect and restore Wayne County's rivers, lakes and streams through the advancement of a holistic watershed management approach. The ESD partners with communities, businesses, residents and others to reduce discharges of stormwater, combined sewer overflows (CSOs), and sanitary sewer overflows (SSOs) to the County's waterways. Activities include detection and correction of illicit sewer connections, public education, sanitary sewer operations, soil erosion and sedimentation control, drains maintenance, and habitat protection/restoration efforts.

Staff of the ESD managed 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 and manages Wayne County's current GLRI grant projects.

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Student bug hunt

GLRI grant tree planting

Green School tree planting

Assisting with Friends of the Rouge Bug Hunt

Collaborative Invasive Species Control in Rouge 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 (WCDPS)

BUDGET: $634,756

START/END DATE: 2015 - 2018

The WCDPS Environmental Services Division (ESD) completed implementation of the Collaborative Invasive Species Control in the Rouge and Detroit River AOCs Project. This project was funded by a competitive request for proposals GLRI grant from the EPA. Project partners included the Alliance of Rouge Communities (ARC), Alliance of Downriver Watersheds (ADW), Friends of the Detroit River (FDR), Friends of the Rouge River (FOTR), the Student Conservation Association (SCA), City of Southfield, Southeast Michigan Council of Governments (SEMCOG) and the Marathon Petroleum Corporation.

During the grant period (2015-2018), over 340 control exercises, involving 41 youth from the Student Conservation Association (SCA) and more than 2,950 volunteers, were implemented by the Project Partners.

These efforts were performed within public and private properties, with an estimated area of approximately 6,850 acres, resulting in the physical removal of over 12,287 cubic yards of invasive species as well as the chemical treatment of invasive species of over 285 acres.

The project increased awareness, technical capacity and working relationships throughout the project area. Training materials, invasive species identification brochures and educational videos were produced and are available from project partner websites. Several example links are:

https://therouge.org/fotr-invasive-species-series/
http://www.allianceofrougecommunities.com/PDFs/PI/Aquatic%20Invasive%20Species%20Field%20Guide%20052316%20final.pdf
http://www.allianceofrougecommunities.com/PDFs/PI/Upland%20Invasive%20Species%20Field%20Guide%20052316%20final.pdf

Rouge River AOC Wayne County Habitat Restoration

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 (WCDPS)

BUDGET: $7.9 million

START/END DATE: October 2016 - December 2020

The Rouge River watershed is a designated AOC under the Great Lakes Water Quality Agreement (GLWQA), and has three Beneficial Use Impairments (BUIs) associated with fish and wildlife habitat: Degraded Fish and Wildlife Populations, Degradation of Benthos, Loss of Fish and Wildlife Habitat. Rouge River Advisory Council (RRAC), the Public Advisory Council (PAC) for the Rouge AOC, finalized a list of projects that need to be completed in order to remove the habitat BUIs. As part of that list three activities were considered as having significant impact on the removal of the BUIs. These are the Henry Ford Estate Dam Fishway, Rouge Oxbow Phase 3, and Nankin Lake Restoration. Under NOAA GLRI grants to the Alliance of Rouge Communities (ARC), the ARC partnered with Wayne County Department of Public Services (WCDPS) to develop the designs for the Henry Ford Estate Dam Fishway and Rouge Oxbow Phase 3 Projects. Wayne County in partnership with the ARC has moved forward with the construction of the Fishway and Oxbow projects and as owner has procured design services and will lead construction of the Nankin Lake Restoration Project.

Project specific summary and outcomes are:

- Henry Ford Estate Dam Fishway - The current HFE Dam is located 8 miles upstream of the Rouge River's confluence with the Detroit River. It is the first dam on the Rouge River upstream of the Detroit River and the Great Lakes system. The HFE Fishway project will reconnect for fish passage an estimated 50 river miles and 108 miles of tributary stream to the Great Lakes system for the first time in over 100 years. Establishment of the HFE Fishway in the form of a natural channel will not only provide fish passage but provide improved diversity within the river corridor for fish species, macroinvertebrates, mussels, and other aquatic life.
- Rouge Oxbow Restoration Phase 3 – In an effort to provide habitat, resting locations for migratory fish, recreational opportunities and restored wetlands within the concrete channel area, Wayne County and The Henry Ford began to restore the Oxbow in 2002. This project (Phase 3) represents over 16 years of efforts to restore the Henry Ford Oxbow and will make the last hydraulic connection and habitat improvements needed to connect it with the Rouge River, making it available to local and Great Lakes migratory fish.
- Nankin Lake Restoration - Over the years, Nankin Lake has filled with sediment. Due to this buildup, the lake is shallow in many areas, decreasing the total acreage of water and habitat present by approximately 1.5 acres. Sedimentation has also degraded shallow water habitat in the littoral zone. Invasion of phragmites and narrow-leaf cattail in shallow water habitat has further degraded the aquatic habitat. Overall, fish productivity and the carrying capacity of the lake have declined. Flow during storm events effects the impoundment and downstream habitats significantly. The project will restore the ecosystem services the lake provides including valuable spawning, nursery, and forage habitat for fishes and other aquatic species of all life stages.

Oxbow open cut to Rouge River

Shaping the Future of the Great Lakes

ECT Environmental Consulting & Technology, Inc.

Environmental Consulting & Technology, Inc. (ECT) is a water and natural resource management consulting firm that works on policy, planning, and implementation projects across the Great Lakes basin. We bring close working relationships with public and citizen advisory councils in the Areas of Concerns (AOCs), and offer strong technical capabilities, committed staff, and proven experience in executing Great Lakes Restoration Initiative (GLRI) projects.

ECT serves as trusted advisors to a large number of local communities, nonprofits, other NGOs, as well as state and federal agencies. Leveraging opportunities presented by the GLRI, ECT staff has assisted our clients on habitat restoration projects in must U.S. AOCs. We have been involved in more than 20 GLRI habitat restoration projects in southeast Michigan alone. Additionally, ECT staff has assisted stakeholders in completing delisting targets and restoration blue prints for nearly a third of the AOCs located in Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio. ECT has also served under contract to the U.S. Environmental Protection Agency on the Great Lakes Legacy Act Construction Services Contract Vehicle. We routinely win regional and national awards for our projects.

ECT supports our clients and partners by leveraging and expanding federal funding opportunities and since 1999, has secured over $115 million for their projects through a variety of grants.

ECT's Experience

- Ecosystem habitat restoration
- Contaminated sediment remediation design & feasibility studies
- Development of natural resource restoration policy/planning
- Hydraulics, hydrology & water quality modeling
- Green infrastructure & low impact design
- Grant related assistance
- NPDES storm water compliance

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Chicago & Lomard – Illinois
Iowa City – Iowa
Lenexa – Kansas
Northfield – Ohio

www.ectinc.com

Wayne County & Alliance of Rouge Communities: Oxbow Restoration Phase III, Dearborn, Michigan

Friends of the Detroit River: Celeron Island Restoration in Grosse Ile, Michigan

Chandler Park Conservancy: Chandler Park Marshland Project, Detroit, Michigan

Friends of the Rouge

Friends of the Rouge (FOTR) is a nonprofit 501(c)(3) organization that was founded in 1986 to raise awareness about the need to clean up the Rouge River in southeast Michigan. The Rouge River Watershed drains 467 square miles. It has four major branches (Main, Upper, Middle, and Lower) with 127 river miles and numerous tributaries. In addition to the flowing water, there are more than 400 lakes, impoundments, and ponds. Within the watershed, there are over 1.35 million people living in 48 municipalities. The Rouge is one of the most accessible rivers in the state, with over 300 parks, 33 public golf courses, 27 nature preserves, and 20,000+ acres of park land, which include 50 miles of riparian corridor. Three counties (Oakland, Washtenaw and Wayne) encompass the watershed and the land is more than 50% urbanized with less than 25% remaining undeveloped.

The mission of Friends of the Rouge is to restore, protect, and enhance the Rouge River watershed through stewardship, education, and collaboration. Primarily, they focus efforts on watershed education. Through the Rouge Education Project, in 2019 they worked with 28 local schools to performing water quality monitoring with over 2,000 students. Their volunteer monitoring program engages citizens to monitor watershed health through surveys of frogs & toads, fish communities, and water bugs (benthic macroinvertebrates). They offer major annual events that include Rouge Cruise and the Industrial Rouge Kayak Tour, which engage participants in the Rouge's history and ecology. Their signature event, Rouge Rescue, began with their founding in 1986 with volunteers removing large quantities of trash from the river, and has since engaged 60,863 volunteers across the watershed at 969 work sites. To address the Rouge's significant challenges with excessive polluted run-off water from storms, in 2018 Friends of the Rouge launched the "RainSmart: 1,000 Rain Gardens for the Rouge" campaign, expanding its Detroit-focused "Rain Gardens to the Rescue" program across the watershed. The next chapter of our work includes development of the Rouge River Water Trail on 27 miles of the lower Rouge from Canton to the Detroit River.

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Canton Rain Garden (photo credit Beth Armstrong, Ford Motor Co.)

FOTR volunteer picnic

Winter stonefly search (photo credit Dalton Murphy)

Collaborative Invasive Species Control in Rouge 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 (WCDPS)

BUDGET: $ 634,756 Grant, $80,222 Match provided by FOTR and City of Southfield, Marathon Petroleum Company, Friends of the Detroit River, Alliance of Rouge Communities, and Alliance of Downriver Watersheds

START/END DATE: 2015 - 2018

This grant was a collaboration between Wayne County, Friends of the Rouge (FOTR), Friends of the Detroit River and others to establish and begin implementing an effective, efficient and environmentally sound program of integrated pest management for invasive species across the Rouge River and Detroit River AOC.

FOTR oversaw efforts in the watershed to utilize volunteers through Rouge Rescue, an annual river cleanup and stewardship event, as well as youth in the Student Conservation Association (SCA) to conduct pre-surveys, remove invasive species and conduct post-surveys. Other partners are using contractors to conduct the work. Over the course of the grant period, Friends of the Rouge worked with 3,434 volunteers, who put in a total of 10,175 hours, to remove 10,700 cubic yards of invasive plants materials from over 100 acres of natural areas.

FOTR also developed and shared a series of public education and outreach materials. Through e-news and social media, FOTR published articles on how to prevent the spread of invasive plants and the threat invasive plants pose to the ecosystem, economy, recreation and human safety. Targeting the nearly 2,000 annual Rouge Rescue participants, FOTR created a new brochure focused on what can be done at home to reduce introduction and spread of invasive species as well as next steps to improve habitat by incorporating native species into the home landscape. Finally, FOTR produced a series of three high-quality videos focused on aquatic invasive species, invasive species in residential landscapes, and phragmites. Videos are available for viewing at https://therouge.org/fotr-invasive-species-series/ .

Finally, FOTR led a series of invasive plant surveys in natural areas across the Rouge. Survey work occurred in relation to all reported control activities as a means to document control efficacy. In Fall 2017 FOTR also focused on conducting invasive plant surveys of a significant section of Rouge Park's flood plain forest and prairie ecosystems, covering 140 acres of the nearly 1200 acre park. FOTR identified 22 invasive plant species over 2,263 data points. Data will be used to support future invasive species management efforts.

Volunteers from Bosch, LLC spend a day removing buckthorn in Farmington

General Motors work day in Rouge Park

Youth employed by the Student Conservation Association spent 6 weeks removing invasive shrubs in Detroit and Redford Twp.

Rouge River Fish Surveys

Rouge River Watershed, MI

FUNDING SOURCE: University of Michigan Water Center, Michigan Department of Environment, Great Lakes and Energy (formerly MDEQ Office of the Great Lakes)

ENTITY RECEIVING FUNDING: Friends of the Rouge, University of Michigan-Dearborn

BUDGET: $110,537 with match provided by students and volunteers

START/END DATE: May 2012 - August 2019

Friends of the Rouge (FOTR) is updating the data for fish in the Rouge River Watershed by surveying every branch and major tributary between 2012 and 2019. The last watershed-wide fish survey was completed in 1995 and summarized in the 1998 State of Michigan Department of Natural Resources (DNR) Rouge River Assessment. The new data will be used to show how the fish community has changed over the last twenty years and to identify areas no longer impaired for fish.

All surveys are conducted using seine and dip nets, sampling all available habitats, and all fish are identified, measured to the nearest 1/2 centimeter and released. Volunteers assist with surveys under the direction of experienced technicians.

FOTR has surveyed all of the major Rouge River branches and tributaries and eight watershed lakes. Sixty-five fish species have been identified, 54 native and nine non-native. A new endangered species was found in a Rouge lake: pugnose shiner. While fish communities are relatively healthy in the headwaters, these areas are rapidly urbanizing, threatening the health of the endangered redside dace which has been declining. Still degraded areas include the Main branch between Eight Mile Road and the confluence with the Middle where combined sewers still remain uncontrolled. Gamefish like yellow perch are now moving up the Lower branch from the Detroit River since the Wayne Road dam was opened. The round goby was also able to move upstream with the opening of the dam and is outcompeting the native johnny darter. Surveys of the recently restored historic oxbow at The Henry Ford found a diverse assemblage of fish even prior to the opening of the upstream end, showing the potential success for habitat improvement projects in the lower Rouge.

With additional funding, FOTR plans to continue monitoring with a focus on tracking the fish community response to habitat improvement projects like the oxbow restoration at The Henry Ford and the fish passage around the Henry Ford Estate as well as continuing to track the impact of the round goby on the fish community.

Endangered redside dace

Fish survey in the oxbow at The Henry Ford

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 and is currently chaired by Michigan Sea Grant (MSG). The Friends of the Detroit River (FDR) has served the PAC since its inception as its fiduciary and supports numerous PAC projects through grant management and administrative assistance. Recent projects including the Stony Island, Celeron Island and Lake Okonoka habitat restorations would not have been possible without the leadership and support of MSG and FDR.

The Friends of the Detroit River is a grass roots citizen's 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, FDR has focused on Detroit River issues and has endeavored to protect the river through grass roots activism, river programs, research and partnerships.

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Celeron Island restoration

Lake Okonoka restoration

Stony & Celeron Islands Habitat Restoration

Detroit, 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: $15+ Million grant, $385,000 in private match

START/END DATE: 2013 - 2019

In 1815, the Detroit River shoreline included coastal wetlands up to a mile wide. Since then, the shoreline development and hardening, industrial and combined sewer contamination, and deep shipping channel excavation has destroyed all but a few acres of this life-rich environment. The Stony & Celeron Islands habitat restoration projects are significant steps toward removing the fish and wildlife related Beneficial Use Impairments (BUI's) and the Detroit River Area of Concern (AOC).

Friends of the Detroit River (FDR) received GLRI funding through NOAA for habitat restoration projects on Stony and Celeron Islands. Activities included data gathering and analysis, engineering, permitting and construction, monitoring and habitat assessment. Restoration of Stony Island was completed in 2018 and Celeron Island in 2019.

The Stony & Celeron Island Habitat Restoration projects created 7,900 linear feet of rock shoals that support vegetation and aquatic habitat, while protecting and promoting growth of over 100 acres of backwater habitat - a calm, vegetated water zone suitable for fish spawning and nursery activity. Over 100 new habitat structures provide homes for fish, turtles, snakes and amphibians. Access to the restoration sites also greatly benefit birders, anglers and hunters using the island and surrounding waters for recreation.

Stony Island restoration

Celeron Island restoration

Stony Island armor stone placement

Celeron Island shoal construction

Lake Okonoka Restoration

Detroit, 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: $6+ Million grant, $40,000 match by Shell Oil Company

START/END DATE: 2014 - 2019

Belle Isle is positioned at the "gateway" to the Detroit River. Here, the river's water quality is at its best, clear and fast flowing from Lake St. Clair. In addition to being the most popular open space in the City of Detroit, the island's unique, 200-acre, wet-mesic flatwoods forest along with its interconnecting lakes and canals provide a significant framework for fish and wildlife habitat. However, most of the island's internal waterways are isolated from the river and the Great Lakes. This project makes advancements in reconnecting Belle Isle's internal waterways to the river and restoring the wet-mesic flatwoods forest to enhance habitat for a great diversity of animal and plant species.

Water bodies on Belle Isle include three lakes, a lagoon and over two miles of canals, totaling 106 acres of open surface water. Historically, these waterways were connected to the Detroit River, providing aeration and circulation for fish habitat. In the 1950's, the waterways were closed off from the river, creating stagnant conditions and eliminating the ability for Great Lakes fish to migrate into the Isle's canal / lake system. Pumps were installed to circulate the water but are costly to maintain and operate.

Making Lake Okonoka more connected and accessible to spawning fish is one major step in improving fish habitat at Belle Isle. The lake is now linked to Blue Heron Lagoon on one end and the Detroit River on the other, allowing Great Lakes water and fish to pass between the bodies of water. Lake Okonoka will become a high-quality haven for young fish to find shelter until they're large enough to survive in the Detroit River.

Additional improvements to the lake included adding gravel spawning beds and digging channels and deep holes to give fish safe passage when water levels are low. Humans will benefit from this project as well; a new bridge on Lakeside Drive will allow paddlers to pass easily between the lake and Blue Heron Lagoon.

Conceptual design for Lake Okonoka

Dredging of Lake Okonoka

Stony Island Habitat Restoration

2019 Project of the Year Award – Environment

Project Partners Include:


Shoal Construction


Construction Oversight


Tern Nesting Habitat


Armor Stone Placement


Project Barge


Snake Hibernation Bunker


Shoal with Soft Inner Shore


Mudpuppy Breeding Habitat


Snowy Owl Observation


Bird and Herptile Resting Logs


Core Stone Shoal Construction


Monitoring


Turtle Habitat

Funding provided by:

Detroit River Canadian Cleanup

The Detroit River Canadian Cleanup (DRCC) is a non-profit organization that is responsible for implementing the Detroit River Remedial Action Plan (RAP) on behalf of a community-based partnership working together to protect, restore, and enhance the Detroit River ecosystem. The Detroit River was listed as an Area of Concern (AOC) under the Great Lakes Water Quality Agreement in 1987 and the DRCC is responsible for restoring the Detroit River's beneficial uses with the ultimate goal of removing the Detroit River from the list of Great Lakes Areas of Concern.

Formed in 1998, the DRCC works to coordinate efforts to address beneficial use impairments within the river. Together with community groups and partners, including Environment and Climate Change Canada, the Ontario Ministry of the Environment, Conservation, and Parks, the Ontario Ministry of Natural Resources and Forestry, and the Essex Region Conservation Authority, the DRCC manages the health of the local environment and works to reduce the harmful effects of increased urbanization on our natural spaces. The DRCC and its partners manage the Detroit River Canadian RAP and contribute to projects that improve the environmental conditions within the Great Lakes through the Monitoring and Research, Habitat, and Point/Non-Point Source working groups.

Many dedicated citizens are also key partners and play an important role in the cleanup process. The public is engaged in the Remedial Action Plan through the Public Advisory Council and the Education and Public Involvement Working Group, which provide a venue for the public to provide input into the Canadian Detroit River RAP process.

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Lake Sturgeon Habitat Restoration at Fighting Island

LaSalle, Ontario, CA

FUNDING SOURCE: Numerous binational agencies including: Essex Region Conservation Authority, US Fish and Wildlife Services, the US Geological Survey, Environment and Climate Change Canada, Ontario Ministry of Natural Resources, Michigan Wildlife Conservancy, BASF Corporation, DTE Energy, Landmark Engineers Inc., International Wildlife Refuge, Michigan Department of Natural Resources, Michigan Sea Grant, and the Wildlife Habitat Council

ENTITY RECEIVING FUNDING: Essex Region Conservation Authority

BUDGET: $500,000

START/END DATE: 2008 - 2013

From the 1970s to 1990s, no Lake Sturgeon spawning was reported in the Detroit River, which, at one time, was one of the most productive sturgeon spawning grounds in North America. In an attempt to increase sturgeon populations and spawning within the Detroit River, both Canadian and American agencies collaborated on a sturgeon habitat restoration project in the Detroit River near the northeast tip of Fighting Island. Northeast Fighting Island was identified as one of the remaining areas for potential fish spawning habitat restoration in Canadian waters as it is a known historical sturgeon spawning area.

As part of this project, a total of 2.1 acres (0.89 acres in 2008 and 1.2 acres in 2013) of aquatic, deep water habitat was restored on the northeast tip of Fighting Island in the Detroit River. The first stage of the project (2008) constructed a boulder field and 12 individual reefs made up of four different rock types. The expansion phase of this project (2013) constructed one reef bed made up of one type of stone (6-12 inch limestone).

Post-construction monitoring of the first stage of this project found Lake Sturgeon spawning occurring in the first and second spring and for multiple years afterwards. In addition, reef monitoring showed Lake Whitefish, Walleye, and native sucker eggs present on the reef. This post-construction monitoring indicates that the spawning reef has continued to increase the productive capacity of spawning habitat for Lake Sturgeon (and other fishes) in the Detroit River. Further, this project has provided additional opportunities to improve our understanding of the presence, distribution, and ecology of Lake Sturgeon in the Detroit River. In 2017, it was estimated that there are over 6,000 Lake Sturgeon in the Detroit River, and over 30,000 in the Lake Huron to Lake Erie corridor.

This project is an excellent example of binational collaboration, partnership, and stewardship of shared resources. The success of this fish habitat restoration strategy will help strengthen and improve the fishery in the Detroit River and the entire Great Lakes. Credit for this successful project is owed to many project partners including Environment and Climate Change Canada's Great Lakes Sustainability Fund, Ontario Ministry of Natural Resources and Forestry, the Ontario Species at Risk Stewardship Fund, DTE Energy, U.S. Fish and Wildlife Service, U.S. Geological Survey, University of Michigan Water Center, and the Great Lakes Restoration Initiative.

Researchers with a Lake Sturgeon caught during post construction monitoring

Construction of the Sturgeon reef

Detroit River Shoreline Stabilization & Habitat Enhancement

Windsor, Ontario, Canada

FUNDING SOURCE: City of Windsor, Environment and Climate Change Canada, Ontario Ministry of Environment, Conservation, and Parks

ENTITY RECEIVING FUNDING: Essex Region Conservation Authority

BUDGET: $4,738,000

START/END DATE: 2001 - 2006

Shoreline hardening has resulted in the direct loss and fragmentation of natural habitat along the Detroit River shoreline – replacing it with reclaimed parkland, industrial land, housing, and other artificial structures such as seawalls. Most of this shoreline hardening along the Detroit River is considered unsuitable for many desirable species. In response to this, "soft" shoreline treatment techniques have become more prevalent in recent years, and involve the use of rock (and other natural materials) in combination with plants to resist erosion. Soft shoreline treatments more closely mimic the naturally occurring foreshores on the Great Lakes, and in doing so, provide greater environmental value.

In 2001, when the existing timber shoreline protection had reached the end of its service life, the City of Windsor, Ontario initiated a soft shoreline stabilization project designed to prevent erosion and enhance fish habitat, simultaneously. The first stage of the shoreline softening along the City of Windsor riverfront consisted of a sloping rock revetment with an undulating shoreline enhanced by rock benches, a sloping rock beach, shoreline wetland, and submerged shoal features as well as riparian plantings. This project benefits aquatic communities through the reduction of wave energy due to the softened shoreline, as well as an increased length of available shoreline. The amount of shoreline that was softened was estimated to be 516 yards (472 m) in length.

A few years later, in conjunction with a major erosion protection project in 2006, approximately 5,000 m^2 of fish habitat was restored along the Detroit River shoreline via shoreline softening at the City of Windsor's Waterfront Park. A 600 yard stretch of shoreline was softened directly up stream of the new Retention Treatment Basin (RTB), which was constructed to help prevent discharges of raw sewage from Combined Sewer Overflows (CSO) to the Detroit River. The existing shoreline adjacent to the RTB was failing wood crib wall, and was replaced by an irregular, undulating shoreline using a variety of rock sizes and shapes to significantly improve fish habitat while at the same time protecting the RTB from erosion.

Aerial of shoreline before project

Aerial of shoreline after project

McKee Park Improvement

Windsor, Ontario, CA

FUNDING SOURCE: City of Windsor

ENTITY RECEIVING FUNDING: Essex Region Conservation Authority

BUDGET: $300,000

START/END DATE: 2003 - 2004

The Detroit River is home to over 65 species of fish. In the winter of 2003/04, a number of improvements were made to the McKee Park shoreline to improve fish habitat. This included construction of large rock islands to protect the shoreline and create an embayment from the high-energy Detroit River water flow. A submerged reef was placed offshore for spawning by Lake Sturgeon and other fish species. Sheltering islands provide a low energy area sheltered from waves and boat wakes for fish to rest and feed. Sand and rounded stone (cobble) placed around these islands provide a living space for aquatic invertebrates that in turn provide food for fish. A sand shoreline of sand and cobble (rounded stones) was added to provide a recreational feature as well as a place for fish, in particular young Lake Sturgeon, to rest and feed.

Partners on this project included the Essex Region Conservation Authority, Ontario Great Lakes Renewal Foundation, the City of Windsor, The Windsor Port Authority, the Environment and Climate Change Canada and the Great Lakes Sustainability Fund, Brighton Beach Power, ATCO Power and Ontario Power Generation.

McKee Park project area

McKee Park from the Detroit River

Collavino Wetland Restoration

LaSalle, Ontario, CA

FUNDING SOURCE: Environment and Climate Change Canada

ENTITY RECEIVING FUNDING: Essex Region Conservation Authority

BUDGET: $275,000

START/END DATE: 2018 - December 2020

The Detroit River and its tributaries have been severely impacted by historical drainage activities since European settlement. With these drainage activities, wetland habitats and their many benefits have been lost. To help restore this wetland habitat loss in the Detroit River and to make progress towards delisting the Loss of Fish and Wildlife Habitat beneficial use impairment, the Detroit River Canadian Cleanup, Environment and Climate Change Canada, and Essex Region Conservation Authority are in the process of restoring a 75-acre coastal wetland in the Canard River, close to its mouth where it meets the Detroit River.

This project involves refurbishing the existing outside berm, maintaining the containment berm along the eastern boundary of the wetland to permit improved water level management flexibility, installing a pumping system, and replacing the existing equalization pipe to allow for gravity water feed in and out of the wetland to increase water circulation. The impounded water will form valuable habitat for waterfowl, amphibians, and aquatic vegetation and will provide the opportunity for water to infiltrate and recharge local groundwater.

The completion of this project serves as an example of good land stewardship with positive environmental benefits for the Detroit River Area of Concern.

Canard River looking from the Detroit River towards the Collavino wetland restoration

Collavino wetland restoration

Peche Island Erosion Mitigation & Fish Habitat Enhancement

Windsor, Ontario, CA

FUNDING SOURCE: Environment and Climate Change Canada, City of Windsor, Swim, Drink, Fish, The W. Garfield Weston Foundation

ENTITY RECEIVING FUNDING: Essex Region Conservation Authority

BUDGET: $2.9 Million

START/END DATE: 2019 - 2020

Peche Island is a 79-acre island located in the upper Detroit River near Lake St. Clair. The island is a municipal park that is accessible by boat and has high biodiversity, including 22 species of rare native plants (235 plant species documented in total), 2 rare reptile species, critical habitat for species at risk, freshwater clams and mussels, and numerous birds (including Bald Eagles) that utilize the island for various life stages. The island has been designated an environmentally sensitive area and the marsh on the island is an Ontario Provincially Significant Wetland.

This important island has been eroding at a rapid pace due to strong river currents and heavy wave action from Great Lakes freighter traffic. The erosion of the island has caused large chunks of land to erode into the river and it is estimated that Peche Island has decreased in area by 17 acres from 1931 to 2015.

Therefore, the primary objective of this project is to create a series of nearshore and sheltering islands and a peastone (cobble) beach on the northeast side of Peche Island and a series of off-shore sheltering islands in the water lot on the north side of the island to protect from further erosion. The proposed off-shore islands on the north side of the island will also create a calm water embayment that will offer fish refuge and the opportunity for macrophytes to establish. It is projected that the entire calm water embayment area will act as a fisheries spawning and nursing area for the Detroit River, which may have spin off benefits for the river further downstream. The area will also be used as a staging, nesting, brood rearing and feeding area for various species of waterfowl. Wading birds such as Great Blue Herons and Black-crowned Night Herons frequent the area and could use the beaches in the calm water area for feeding. Shorebirds would also use the beaches in the calm water area during spring and fall migration. The beaches on Peche Island have also been used in the past as nesting areas for Spiny Softshell turtles.

In time, this embayment area is anticipated to provide valuable aquatic habitat to local fish and wildlife. This project is the single largest investment in structures that are designed to benefit fish in the Canadian Detroit River AOC and construction of the project is expected to begin in late Fall 2019.

Proposed locations of sheltering islands & cobble beach

Current conditions showing eroding trees

Lenawee Conservation District

Established in 1946, Lenawee Conservation District is an independent county level resource assisting residents, producers, and communities to help resolve natural resource concerns. The District is self-funded, serving the public with revenue obtained through an annual tree and shrub fundraiser sale, grants, and county appropriations.

Lenawee Conservation District works with a variety of other local, state, and federal agencies and organizations to accomplish greater results in conservation and protection of our local natural resources.

As a result of the Dust Bowl in the 1920s from severe erosion due to negatively impacting farm practices, Congress established the Natural Resources Conservation Service, which directed money toward programs that would help protect natural resources and empower landowners to become better stewards of the land. But with no delivery approach for the federal programs, Congress realized that a local level organization was needed to help promote conservation programs available to agricultural landowners.

Thus, a Conservation District Law was established, allowing communities to elect their own county conservation district boards, which would partner with the federal agencies and serve as the storefront and information center for available conservation programs and assistance.

The Lenawee Conservation District has received grants from the Michigan Department of Environmental Quality and the Great Lakes Commission to work with farmers within Lenawee County on potential improvements toward water quality and the impact to Lake Erie. These projects are in an effort to meet the State of Michigan's phosphorus reduction goals of 20% by 2020 and 40% by 2025 within the River Raisin. Farmers have the ability to receive some assistance to incorporate the following Best Management Practices (BMPs) in targeted watersheds: Drainage Water Management Structures, Buffer Strips, Saturated Buffers, Blind Inlets, and GPS Nitrogen sensors.

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Center for Excellence field day

Bee keeping training

Aerial cover crop seeding

SE Lenawee County Drainage Water Management (DWM) Systems

Lenawee County, MI

FUNDING SOURCE: Great Lakes Commission (GLC)

ENTITY RECEIVING FUNDING: Lenawee Conservation District

BUDGET: $59,850

START/END DATE: September 2016 - December 2016

In 2016 it was reported that 75-85% of dissolved reactive phosphorus and nitrate nitrogen is coming from agricultural land. It has been further documented (King, ARS Ohio) that 50% of the nutrients are being delivered into surface waters through subsurface drainage systems.

When using drainage water management (DWM) systems, the total flow was reduced by 45% which directly impacts the total load getting into surface waters. Total load was 24.7 lbs. of nitrate nitrogen under a free-flowing system to 13.45 lbs./acre using a drainage water management system. This is a reduction of 11.25 lbs./acre of nitrate nitrogen (Fausey 2004). In another study in north central Ohio, Walnut Creek watershed study, from 2006-2012 data was collected on 14 Hectare sites and was evaluated for concentration, total flow, and total load. DWM did not significantly affect DRP concentration but demonstrated a 65-74% reduction in annual DRP load with DWM depending on the year and rainfall events in the watershed.

The following best management practices were installed to jump start future grant proposals as well as being demonstration sites to show other local farmers how the practices work.

Blind Inlets
- 8, covering 120 acres
- 48 total tons of soil saved
- Blind inlets are GPS marked. No spraying or fertilizer applied over. Just planted over.
- Greatly reduces Total P, sediment, and soluble nutrients

Saturated Buffers
- 4, at 2.75 acres (3,000 ft..)
- Treating 82 acres of tile drainage water reducing the nitrate nitrogen loss by 50% or more totaling 930 lbs. of Nitrate N
- Buffer will filter some sediment - 2 tons/acre/year or 16.4 tons
- Maintenance consists of a good grass cover and removing the grass one time annually to pull out nutrients
- Reduces Nitrate N from upstream drainage systems

Drainage Water Management Structures/Underground Outlet
- 18 structures/outlets impacting 255 acres and reducing 2,856 lbs. of Nitrate N and 51 lbs. of DRP
- Farmers will manage the structures according to DWM plan
- 45% reduction in DRP and Nitrate N

Installation of blind inlet

Before installation of blind inlet

Watershed Wide Conservation

Lenawee County, MI

FUNDING SOURCE: Great Lakes Commission (GLC)

ENTITY RECEIVING FUNDING: Lenawee Conservation District

BUDGET: $200,000 grant, $135,630 match from Lenawee Conservation District and local farmers

START/END DATE: October 2017 - September 2020

The goal of this project is to implement a watershed wide conservation practice initiative using the Great Lakes Sediment and Nutrient Reduction Program funding with priority funding concentrating on the Keller Riga Drain (4,327-acre watershed) and expanding out if necessary, to surround watersheds which include: Camp Drain, Dunlap Drain, Floodwood Creek, Halfway Creek and North of Ten Mile Creek. Agricultural land use is 90% of the proposed watershed area (over 47,000 acres). The agricultural fields are intensively tile drained and serviced by miles of open legal county drains. The project was designed to have high participation with local farmers.

The proposed conservation practices to fund through the project include: Drainage Control Structures, Filter and/or Buffer Strips, Variable Rate Nitrogen Sensors, Two Stage Ditch and Blind Inlets. All practices are permanent in nature and can be used to implement other conservation practices. These were all practices requested by farmers within the watersheds. The practices will mitigate nutrient and sediment loss from cropland fields directly improving water quality in the basin.

Drainage Water Management structure

Project Highlights

- Filter and/or buffer strip: A 25-foot-wide grass strip to mitigate field sediment loss into surface ditches.
- Drainage structures with Drainage Water Management: To hold nutrients back in fields.
- A site for a two-stage ditch has been identified by the Lenawee County Drain Commission. Filtering 10.12 miles of drain in the 4,327-acre drainage district.
- GPS Nitrogen sensors with nutrient management: Along with managing and mitigating DRP loss through tile lines or surface water runoff the other culprit contributing to the algae bloom is nitrate nitrogen leaving a cropland field at an alarming rate of 24.7 lbs. per acre on intensively tile drained fields. GPS nitrogen sensors will allow farmers to apply nitrogen only if crop needs it.
- Blind Inlets: Several surface inlets have been identified in the watershed. Reduces gross erosion in watersheds from getting into surface outlets.

Installation of blind inlet

Filter strip

Phosphorus Remediation

Lenawee County, MI

FUNDING SOURCE: Great Lakes Commission (GLC)

ENTITY RECEIVING FUNDING: Lenawee Conservation District

BUDGET: $50,000 grant, $25,000 match from Plant Tuff

START/END DATE: October 2017 - September 2020

To implement and demonstrate permanent new technology conservation practices which will reduce in stream and tile outlet concentrations of dissolved reactive phosphorus (DRP) leaving the site.

The Plant Tuft phosphorus remediation projects will use a silica-based slag that will latch on to dissolved reactive phosphorus found in surface water and subsurface water. The size of the P filter will be a function of water volume and existing P concentrations in the water.

If these are effective the goal is to identify other streams, ditches or county drains that would be good for P filtering. A model could be developed with companies and Local County Drainage Districts around the State which would include a company installing instream and subsurface drain filters at no fee but then contracted to maintain and replace filters when necessary as before and after water samples dictate with time. Cost of maintenance then could be spread-out over-all landowners in the drainage district.

The projects will be installed at a livestock farm where P soil test levels are high up and down stream of the tributary. In addition, the Keller Riga Drain has been identified as a drainage district targeted for implementing a drainage district water quality plan. This process is in partnership with the Lenawee County Drain Commission, Lenawee Conservation District, and farm operators within the drainage district.

The DRP reduction practice (filter) is designed to reduce in stream DRP by a minimum of 35% but a higher level of DRP is expected or planned for. The life span of the filter is 3-10 years.

Water quality data will be sampled upstream and downstream of the permanent structures.

Filter installation

River Raisin Watershed Strip-Till

Lenawee County, MI

FUNDING SOURCE: Great Lakes Commission (GLC)

ENTITY RECEIVING FUNDING: Lenawee Conservation District

BUDGET: $200,000 grant, $190,000 match from Lenawee Conservation District and local farmers

START/END DATE: October 2016 - September 2019

To develop a program that brings a systems approach to controlling erosion in a corn and soybean rotation by utilizing strip-till equipment or retro fitting the farms no-till corn planter to minimize sediment and nutrient loss to Lake Erie.

It's the District's goal that with this project we might be able to expand on current conservation efforts in place by landowners within the River Raisin Watershed to continue to reduce the amount of nutrients entering Lake Erie.

In the River Raisin Watershed approximately 80 percent of all the land is under cultivation, 548,864 acres. Sediment loading is the number one water quality resource concern. It causes millions of dollars in sediment removal in our harbor, ditches and streams. The River Raisin has a total sediment load to Lake Erie of 63,530 tons annually. This sediment is 37% of the total sediment in Lake Erie annually. While not the main contributor of sediment our watershed size and amount of land in agriculture gives us a great opportunity to make a difference both locally in streams and in Lake Erie.

Strip-till is a conservation practice used to minimize tillage on the land. Strip-till is a combination of soil drying and warming of conventional tillage with the soil-protection advantages of no-till to only disturb the soil for the seed row. Special equipment is required for this type of tillage. Strip-till allows for a better seedbed vs. no-till due to the fact it warms the soil quicker. Strip-till allows for the soil's nutrients to be placed at a location better adapted for the plant's needs, while maintaining residue cover on the soils surface.

Some soil and water erosion could still occur, however the amount of erosion on a strip-tilled field is lighter compared to the amount of erosion from intensively tilled fields. Liquid fertilizer can be directly applied into the same row the seed is being planted in. This type of application enables the amount of fertilizer needed to be reduced and improve proximity to the roots.

Strip-till into soybean stubble

Strip-till can reduce the number of passes a crossed the field down to two or possibly even once depending on if there is any combination with other machinery, be it a planter, fertilizer spreader or chemical sprayer. Strip-till not only saves considerable time and money but reduces soil compaction and conserves soil moisture compared to intensive tillage. This precision farming has the ability to increase yields.

Strip-till into a cover crop

Efforts were focused in the South Branch, Black Creek, and Bear Swamp Creek of the River Raisin. It was logistical to target these watersheds due to them being a TMDL area as well as the highest area of sediment delivery within the River Raisin.

Closed Loop Drainage Water Management/Sub-Irrigation System

Lenawee County, MI

FUNDING SOURCE: Great Lakes Commission (GLC), The Nature Conservancy (TNC)

ENTITY RECEIVING FUNDING: Lenawee Conservation District

BUDGET: $50,000 GLC grant, $20,000 TNC grant, $348,000 match from local farmer

START/END DATE: October 2017 - September 2020

To implement a closed loop drainage system and sub-irrigation system on a large field scale to minimize downstream flooding and increased nutrient loading from the installation of a new subsurface drainage system.

The project is to provide an outlet for a new subsurface drainage system on 110 acres by installing a pumping plant system that will harvest the subsurface drainage water into a storage pond. The harvested water will then be pumped into the subsurface drainage system (sub-irrigation) to be used by the crop during the 100-day growing season. The project has planned phases for implementation: Complete engineering plan for the proposed project. Secure all state and local permits needed to implement the project. Install storage reservoir for annual drainage water with pumping plant to harvest subsurface drainage system. Install mains and sub-main tile as the drainage plan. Implement the lateral tile as proposed in the subsurface drainage system. Develop and analyze cost/benefits of the system as it is being implemented and utilized for intensive corn, soybean, and wheat production system.

The conservation practices that will be implemented at this project site include: subsurface drainage system, pumping plant, dike, pond, structures for water control, drainage water management, and irrigation water management. These practices will complement what the farmer is already doing; nutrient management, cover crops, conservation tillage, and conservation crop rotation.

This project is to help reduce some of the 65% total Phosphorus and Nitrate Nitrogen entering Lake Erie that is coming from agricultural land. Approximately 50% of the dissolved reactive Phosphorus and Nitrate Nitrogen is coming through subsurface drainage systems. It is also noted that 35% of the total Phosphorus is in the Dissolved Reactive form.

Installation of closed loop drainage system

Installation of closed loop drainage system

River Raisin Watershed Council

The River Raisin Watershed Council (RRWC) was formed in 1974 under Michigan's Local River Management Act and is governed by a Board of Directors appointed by dues-paying member municipalities. We are a public service non-profit 501(c)(3) organization.

Our mission is to partner with others to protect and preserve the River Raisin Watershed. We work with partners and volunteers on various activities, including classroom and public education, outreach to farmers, water quality monitoring, volunteer cleanups, and by encouraging recreation on the river. Through these actions we hope to connect more people of all ages and backgrounds to nature, fostering a better understanding of the value of healthy natural resources in our watershed.

The River Raisin Watershed is nearly the size of Rhode Island, about 1,072 square miles. The river is about 140 miles long, beginning in the Irish Hills and meanders out to Lake Erie. The River Raisin Watershed is home to over 170,000 people and most of the land is used agriculturally. The river is said to be the world's "crookedest" river due to all its twists and turns.

As of 2019, 52 of 63 municipalities in the watershed are members. The Board of Directors meets twice a year, in April and October. These meetings are open to the public and include a speaker to talk about interesting information and issues about local natural resources.

Activities of RRWC are managed by the Executive Committee composed of representatives of the three major counties in the watershed (Lenawee, Monroe and Washtenaw) and four members elected annually by the Board of Directors. The Executive Committee meets monthly.

RRWC applies for various grants to help achieve our goals. Residents can support RRWC by becoming individual members. Members contribute to the strength of RRWC through dues, volunteer activities, and participation in various committees that make recommendations to the Executive Committee regarding RRWC activities.

RRWC wants to get more people out to enjoy the river to experience and appreciate the river and its resources.

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Riverside Park in Adrian

Skunk cabbage in the Ives Road Fen Preserve in the River Raisin floodplain

Kayaking along the Indian Trails Park in Tecumseh

Farmers Taking Action to Protect Water Quality in Western Lake Erie Basin

Western Lake Erie Basin

FUNDING SOURCE: Fred A. and Barbara M. Erb Family Foundation

ENTITY RECEIVING FUNDING: Michigan Association of Conservation Districts (MACD)

BUDGET: $532,500

START/END DATE: October 2016 - September 2022

This project covers the Western Lake Erie Basin (WLEB) with a focus on the River Raisin watershed. Project partners include the River Raisin Watershed Council, the Lenawee Conservation District (LCD) and the Michigan Department of Agriculture and Rural Development.

The Farmers Advisory Committee (FAC) continued to sponsor meetings for farmers and agribusiness twice a year to discuss conservation initiatives, new research results, cost share opportunities, and ways to improve water quality on the field. The FAC was expanded into four regional areas of the River Raisin Watershed, each led by a volunteer farmer leader. Small group "coffee hours", shop talks, and one-on-one conversations have built trust among the partners and agriculture community. Farmer leaders were involved in different presentations and interviews across the state to promote different best management practices (BMPs) and talk about the FAC and its goals. The FAC represents over 20,000 acres of farmland, with over 100 new farmers beginning Michigan Agriculture Environmental Assurance Program (MAEAP), with an approximate 377,736 pounds of phosphorus reduced since 2016.

The FAC subgroups had three rounds of cost share cycles to promote BMPs that reduce sediment and phosphorous loss. This cost share is an opportunity for farmers who are not interested or successful in applying for federal cost share programs. Many farmers have been discouraged by the lengthy wait times and red tape of government programs. This cost share had a quick and transparent ranking and payment process. 13 farmers have applied for cost-share applications since 2017 for various conservation practices.

Water Words that Work LLC, (WWW), a strategic marketing firm, taught leaders to create a more engaging and relevant website for MAEAP and the Farmer-Led Watershed Conservation group. With their help, signs were created with four of the most popular BMPs in the area for farmers to put on their fields for others to see what they're doing on their land and how it relates to water and soil health.

Funding was renewed beginning in October 2019 until September 2022 to focus on involving young farmers, women farmers, and Certified Crop Advisors along with strengthening partnerships previously made in the community. Water sampling on farm fields, continued promotion of MAEAP verifications and best management practices to farmers and the general public, and increased nutrient and sediment retention on fields through BMPs will all be the focus of the next three years.

Center for Excellence meeting

Cover crop planting

Adopt-A-Stream

FUNDING SOURCE: River Raisin Watershed Council (RRWC)

ENTITY RECEIVING FUNDING: River Raisin Watershed Council

BUDGET: $500 Annually, with match provided by Adrian College and Lenawee Intermediate School District

START/END DATE: 2002 - Ongoing

Adopt-A-Stream is a project for people to explore different parts of our river and learn about science. Volunteers collect macroinvertebrates, aquatic insects, from the river and identify them to teach us a little about the health of the river. Since some bugs are more sensitive to pollution than others, finding out what lives in the river and assessing the sampling location can help us learn what's going on with the health of our river and point to areas that need more help than others.

Adopt-A-Stream has been a project with RRWC since 2002, with involvement of a key volunteer (a professor from Adrian College) beginning in 2007. Volunteers from RRWC and Adrian College have sampled for macroinvertebrates at 20 different sites across the River Raisin Watershed in the fall and spring of each year. Adrian College biology professor Dr. Jim Martin has continuously involved his biology and entomology classes to give them hands-on experience in field work, data collection, and bug identification. He is also the bug-identifier, who has tirelessly dedicated his time to IDing and training others to be Adopt-A-Stream ready. Dr. Carley Kratz from the Lenawee Intermediate School District has also involved groups of her high school students to collect macroinvertebrates from the river. There are dedicated volunteers, especially in the Saline area, who have helped with this project since the beginning. Without all organizations, institutions, and volunteers involved, Adopt-A-Stream wouldn't be possible.

Each spring and fall, the project begins on a Saturday with the Training Day, where Dr. Martin explains to volunteers the history and description of the watershed, proper sampling technique, how to fill out the data sheets, and how to be safe in the river. The next Saturday is Stream Search Day, where participants meet at Adrian College to collect supplies and head out to their sampling locations across the watershed. This day is the most fun, even in rainy weather! After all the samples have been collected and turned back in to Adrian College, a Bug ID Day happens on another Saturday so people can find out the types of bugs they found at their sites. Volunteers sort the bugs and Dr. Martin identifies them in the lab at Adrian College.

The value of collecting 17 years' worth of data from this project is incredible. Since macroinvertebrates can tell us about river health, diving into the data to view trends, diversity, and the history of the river will give us an indication of how good or bad our water quality is. All the data has yet to be analyzed and is being put into a database to ease the analysis process. Results will be made public on the RRWC website.

River Raisin Water Festival

Adrian, MI

FUNDING SOURCE: Adrian Noon Rotary, Anderson Development, Greater Federation of Women's Clubs of Lenawee County,

ENTITY RECEIVING FUNDING: River Raisin Watershed Council

BUDGET: $1,075 with $1,600 in-kind match from Lenawee Intermediate School District, $1,300 in-kind match from River Raisin Institute, $1,400 in-kind match from RRWC, $2,800 in-kind match from Adrian Dominican Sisters

START/END DATE: January 2019 - May 2019

The River Raisin Water Festival is a collaboration between many different partners and modeled after the River Raisin Institute's (RRI) Lake Erie Water Festival. RRI collaborated with the River Raisin Watershed Council (RRWC), Lenawee Intermediate School District (LISD), and Adrian Dominican Sisters (ADS) to create a field trip day for 5th and 6th graders of Lenawee County to learn about water and conservation. Three schools from Lenawee County were invited to attend the first River Raisin Water Festival at the ADS Green Campus in Adrian in 2019. The schools were split into smaller groups and visited eight different presenters across the campus. Each presenter was a professional in the field of natural resources with an interactive presentation for the student groups. Each student group saw four presenters in the morning, took a break for lunch, then saw four more presentations in the afternoon.

The presenters included a Farm Bill Biologist from the Lenawee Conservation District teaching about habitat restoration, an educator from Hidden Lake Gardens teaching about macroinvertebrates, Dept. of Environmental Quality retiree teaching about vernal pools, a Dept. of Natural Resources biologist teaching about wetlands and birds, a botanist teaching about rare plants in Lenawee County, educators from RRWC and LISD teaching about land use and water quality, a permaculture specialist teaching about rain gardens, and LISD high school volunteers teaching about composting.

LISD had a group of volunteer high school students who were vital in creating a lesson to teach the student groups and for creating take-home teacher goodie bags. This was a great learning experience for them to learn how to plan events and teach younger students. Volunteers from sponsors (Adrian Noon Rotary, Adrian Dominican Sisters, Anderson Development, and the Greater Federation of Women's Clubs) helped lead student groups across the campus, assisted presenters in setting up, and helping things run smoothly.
Feedback from teachers, students, and volunteers were positive and hopeful for another year. While 2019 was the first River Raisin Water Festival, we plan to continue this event to get young students involved with natural resources, help them see the value of the river and its ecosystems, and discover potential career options. The planning committee for 2020 has started looking to add more presenters to include a more diverse array of natural resources topics that relate to water.

Japanese Knotweed Eradication

Adrian, MI

FUNDING SOURCE: Jackson Lenawee Washtenaw Cooperative Invasive Species Management Area (JLW CISMA)

ENTITY RECEIVING FUNDING: River Raisin Watershed Council

BUDGET: $845 with $300 match from RRWC

START/END DATE: July 2019 - September 2020

The RRWC relies on partners and volunteers to teach others about the watershed and help restore important habitat within the watershed. The Jackson Lenawee Washtenaw Cooperative Invasive Species Management Area (JLW CISMA) has been a great partner in eradicating invasive species and teaching others to identify and report invasive species. Their priority plant species include plants that not only cause ecological harm, but have potential to wreak economic havoc. These species include Japanese stiltgrass (Microstegium vimineum), parrot feather (Myriophyllum aquaticum), Japanese knotweed (Fallopia japonica), Giant hogweed (Heracleum mantegazzianum), and Phragmites (Phragmites australis).

Because there are known areas around the River Raisin with Japanese knotweed growing on or near the banks, RRWC decided to target this species. As most invasive species tend to do, Japanese knotweed can choke out native vegetation, reducing the diversity of habitat and forage for wildlife. It can grow through concrete, causing harm to foundations of homes, sidewalks, driveways, and trails. The City of Adrian gave RRWC locations of known patches of Japanese knotweed, one being at Riverside Park in Adrian. It is along the Kiwanis Trail, a popular biking and walking trail in Lenawee County, and near the River Raisin. Since this plant is a prolific grower and can sprout from cuttings, the location of this patch was top priority to prevent the plant from spreading further. RRWC applied for and received a small grant from JLW CISMA to hire a contractor to treat this patch of Japanese knotweed.

The grant covers the contractor's time to spray the knotweed with herbicide, the only known way to battle this plant successfully. Before spraying in mid-September, volunteers from RRWC and the Lenawee County Drain Commission cut the stems in August to disrupt the growing process and force the plant to use more energy to grow back.

Since Japanese knotweed is such a stubborn plant, it tends to grow back if the herbicide doesn't hit all the stems and leaves. RRWC and its volunteers will continue to monitor this location in 2020 to be sure it doesn't grow back. The grant from JLW CISMA covers enough for the contractor to come back to spray in 2020 if the knotweed grows back. RRWC will apply for this grant in 2020 to cover more areas with Japanese knotweed in order to eradicate this invader.

Volunteers cutting Japanese knotweed

Illinois Indiana Michigan Minnesota New York
Ohio Pennsylvania Wisconsin Ontario Québec

www.glc.org

Great Lakes Commission
des Grands Lacs

Who we are

The Great Lakes are a vital environmental and economic asset for the eight states and two provinces that make up our region. The lakes fuel our regional economy and are fundamental to our identity and quality of life. They hold 90 percent of the U.S. supply of fresh surface water and provide drinking water for more than 48 million people in the U.S. and Canada. More than 1.5 million U.S. jobs are directly connected to the Great Lakes, generating $62 billion in wages annually.

To ensure that we protect and wisely manage this vital resource, the eight Great Lakes states formed the Great Lakes Commission (GLC) in 1955, via the Great Lakes Basin Compact. Ontario and Québec signed on as associate members in 1999. The GLC enables its member states and provinces to speak with a unified and powerful voice on behalf of the Great Lakes-St. Lawrence River region and its more than 48 million residents.

The states and provinces are represented on the GLC by delegations of three to five members from each state or province comprised of agency directors, senior managers, legislators, and appointees of the governor or premier. The GLC maintains a professional staff based in Ann Arbor, Michigan, but carries out its work across the binational Great Lakes-St. Lawrence region.

What we do

The GLC provides the following core services to our member states and provinces: 1) communications and outreach; 2) information management and delivery; 3) facilitation and consensus building; 4) policy coordination and advocacy; and 5) regional project management. We employ these services to carry out a variety of projects and activities addressing priorities for our member jurisdictions in the areas of:

- **Water Quality**
- **Water Use, Management and Infrastructure**
- **Commercial Navigation**
- **Great Lakes Waterfront Community Revitalization and Economic Development**
- **Coastal Conservation and Habitat Restoration**
- **Aquatic Invasive Species Prevention and Control**
- **Information Management and Blue Accounting**

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City of Monroe's Commission on the Environment and Water Quality & River Raisin AOC

In 1987, the lower 2.6 miles of the Raisin River in Monroe, Michigan was designated a Great Lakes Area of Concern (AOC). The River Raisin Remedial Action Plan identified nine beneficial uses as being impaired. Since that time the River Raisin AOC Public Advisory Council (PAC) has worked relentlessly to remove the BUIs and delist as an AOC. Since 2006, the River Raisin AOC PAC has been nested under the City of Monroe's Commission on the Environment & Water Quality (COTE).

Known as the River Raisin Legacy Project, extensive work has been completed including PCB sediment removal, restored fish and wildlife habitat, re-creation of lake marsh and lake-plain prairie, removal of low-head dams, creation of fish passages, controlling invasive Phragmites and Flowering Rush, and extensive educational outreach projects.

To date, all the actions plans have been implemented and the AOC is now in a monitoring phase. Recreational and quality of life improvements are steadily on the rise. Increased numbers of anglers and kayakers are seen in the River. In 2018, over 53 miles of the River Raisin and its environs were designated as a National Water Trail System. Bird populations are also starting to recover, bald eagle and osprey are known to nest in the area; and migrating shorebirds arrive by the thousands to use the restored coastal marsh areas. Steelhead are being caught several miles upriver while large pike and other game fish are being landed in Dundee, Michigan. For the first time in more than 80 years, the 23 miles of river upstream of Lake Erie are open for fish passage.

Reclaiming the River Raisin has a cascading effect on wildlife, bringing fish to spawn, freshwater mussels, aquatic insects, waterfowl and other wetland-dependent fauna. With improving accessibility to the environment, connecting to this amazing natural resource is available as never before in our lifetime.

The success and progress toward delisting illustrates the City of Monroe's hard work toward a federally identified issue. Working together – public and private partners – we can realize the goal of delisting and for a revitalized waterfront community for our children and future generations.

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River Raisin AOC Representative: Richard Micka
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Phone: 734-604-5960

PCB-Contaminated Sediment Remediation

Monroe, MI

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

ENTITY RECEIVING FUNDING: City of Monroe

BUDGET: $17.3 Million

START/END DATE: 2012 - 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 Project includes excavation of the Sterling State Park Confined Disposal Facility (CDF) then using it to dispose of PCB-contaminated sediment from the AOC. The use of the CDF required the removal of an equal volume (106,000 cubic yards) to preserve the capacity of the CDF for future navigation channel maintenance. Testing confirmed that 112,000 cubic yards of CDF material is inert and the material will be excavated, dewatered, stockpiled and used on the Ford property site. The total dredging volume from the river includes 109,000 cubic yards of material. The project was completed in early 2013.

Dredging activities

Project completion

Dam Removal and Fish Passage Creation

Monroe, MI

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

ENTITY RECEIVING FUNDING: City of Monroe

BUDGET: $2.96 Million

START/END DATE: 2012 - 2014

The mouth of the River Raisin hosts the only Michigan port on Lake Erie and was once home to abundant wetlands and sturgeon. Where the River Raisin winds through the City of Monroe, it once flowed over six low head dams constructed by the Works Progress Administration in the 1930s.

Decades later, the River Raisin Legacy Project restored the River's natural flow through various projects. Two low-head dams were completely removed, and a bypass channel was installed around another. Fish passages were constructed by installing rock ramps at four dams, which house active sanitary sewers that cross the river above the bedrock. The mill race around the Grape Dam, approximately 7.5 miles west of Monroe, was restored allowing fish passage around the dam and for the first time in over 80 years the lower 34 miles of the River Raisin from Lake Erie to Dundee, Michigan is now open to game and non-game fish migration. Enhancing connections between the lake and the river, the fish passages improve access to spawning and rearing habitat further upstream.

Dam removal

Fish passage

River Raisin Legacy Project Mini-Documentary

Monroe, MI

FUNDING SOURCE: PAC Support Grant

ENTITY RECEIVING FUNDING: City of Monroe

BUDGET: $11,000

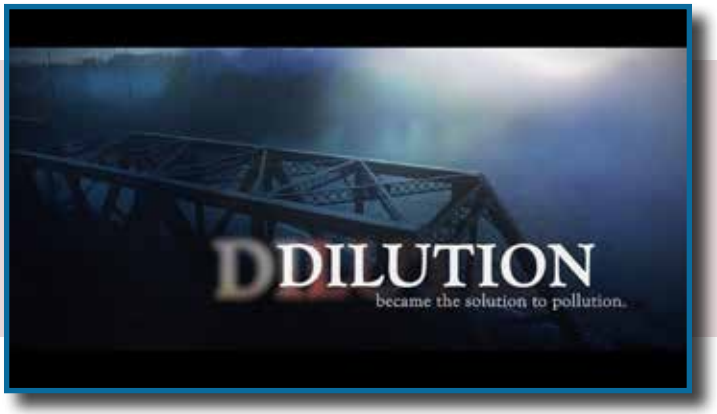
START/END DATE: July 2018 - April 2019

A mini documentary film was completed detailing the extensive remediation, restoration and revitalization efforts over the past three decades in the River Raisin. This effort, called the River Raisin Legacy Project, illustrates the cleanup work, habitat restoration, remediation and recreational enhancements among many other projects and activities.

This video documents the recent work on the River Raisin to delist it as an Area of Concern (AOC), which includes removal of dams, installation of fish passages, removal of toxic hotspots and reinvigoration of the natural environment. It features interviews with Jon Allan, Director of the Michigan Office of the Great Lakes (OGL), Department of Environmental Quality (DEQ); Mark Tuchman, Environmental Scientist with the United States Environmental Protection Agency (US EPA); Scott Cieniawski, Section Chief US EPA, Great Lakes National Program Office; Michelle Selzer, Lake Erie Coordinator, MOGL; as well as local citizens Dan Stefanski and Richard Micka – longtime champions of the River Raisin come-back, members of the River Raisin Public Advisory Council and COTE.

The 'River Raisin Legacy Project' film is a powerful visual outreach tool that enhances existing educational outreach material and initiatives COTE has released. This is a positive statement of Monroe's hard work on a federally identified issue. It is currently being accepted into Environmental Film Festivals across the US. The film can be viewed at https://www.riverraisinlegacyproject.com/ .

Legacy Project film poster



Legacy Project film still

Sterling State Park Project

Monroe, MI

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

ENTITY RECEIVING FUNDING: Sterling State Park

BUDGET: $3.42 Million

START/END DATE: 2011 - 2012

At Sterling State Park, Michigan DNR re-created approximately 18 acres of emergent and submergent Great Lakes marsh and 32 acres of lakeplain prairie.

A second project involved repairing dikes and installing water control for 310 acres of marsh. Phragmites were also controlled in approximately 1,100 acres.

The initial project was completed in December 2012. Annual phragmites control and monitoring continued for years after.

Dredging at Sterling State Park

Interpretive Signage Project

Monroe, MI

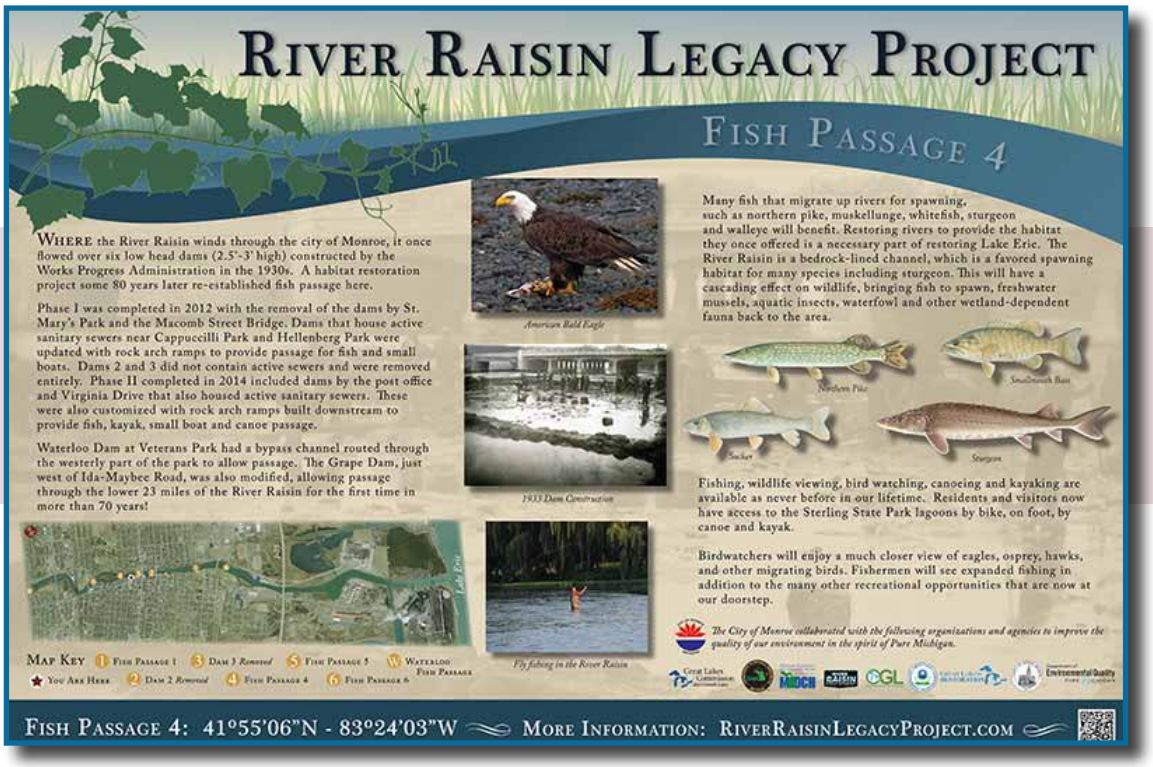
FUNDING SOURCE: PAC Support Grant

ENTITY RECEIVING FUNDING: City of Monroe

BUDGET: $7,970

START/END DATE: 2014 - 2016

Over the course of two years, seven wayside interpretive signs were created and installed along the River Raisin. These interpretive signs tell the story of the decades-long work on the River Raisin Legacy Project. The signs are located at key areas where access and viewing of the River Raisin is optimal. The look and style of the signs are in keeping with the strong brand identity that was created for the legacy work on the River Raisin Area of Concern.



Interpretive sign

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 47 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.

CRWC programs include volunteer citizen science programs (Adopt-A-Stream and Road Stream Crossing), educational programming (Stream Leaders and stormwater education), watershed management activities with a focus on large scale restoration projects and project monitoring, public advisory council (PAC) administration and the Clinton River Coldwater Conservation Project. In addition to this CRWC coordinates cleanup efforts around the watershed via the Keeping it Clean initiative which includes Weekly Clean and annual trash runs using canoes and kayaks on the river.

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Watershed Ecologist: Eric Diesing
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Galloway Creek Habitat Restoration

Rochester Hills, MI

FUNDING SOURCE: Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Clinton River Watershed Council

BUDGET: $3 Million

START/END DATE: 2017 - 2019

The Galloway Creek Habitat Restoration project was one of eleven projects funded by the USEPA within the Clinton River Area of Concern (AOC). This project is located on the Katke-Cousins Golf Course on the campus of Oakland University in Rochester Hills Michigan. The project was done in partnership between USEPA, USACE, Stantec Inc., Consumers Energy, Katke-Cousins Golf Course and Oakland University. Galloway Creek begins near Pontiac, Michigan and flows down through Oakland University and the golf course before meeting the Clinton River in Rochester Hills. Within the golf course the river had eroded away sediment and exposed a Consumers Energy pipeline while also experiencing connectivity issues and lack of habitat.

This project restored nearly 4,000 feet of Galloway Creek while also protecting the exposed pipeline. The stream was stabilized using natural channel design, re-meandering and improving stream crossings on the golf course. In addition 2,710 feet of toewood was installed for bank stabilization and habitat improvement and 1,053 feet of log riffles were added for habitat complexity and to help maintain flow regimes. Future phases of the Galloway Creek project will include continued invasive species control and native prairie and wetland development.

CRWC conducted project monitoring for Galloway Creek before and during project construction. Data collected included habitat and macroinvertebrate indices, invasive species inventories and water temperature. These parameters will be repeated again following project completion and the data collected will be reported to USEPA as well the state of Michigan upon conclusion. CRWC intends to continue monitoring the success of this project and all of the eleven AOC projects throughout the Clinton River watershed.

During construction

During construction

After construction

Clinton River at Yates Restoration

Rochester Hills, MI

FUNDING SOURCE: Michigan Department of Natural Resources (MDNR)

ENTITY RECEIVING FUNDING: Clinton River Watershed Council

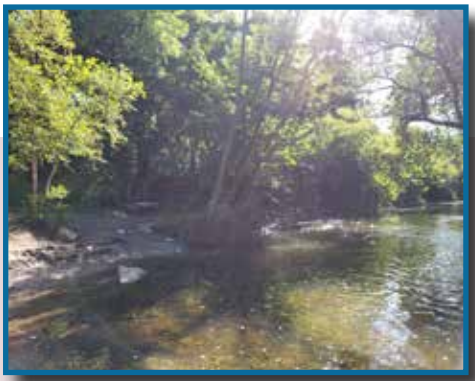
BUDGET: $287,500 Grant, plus $35,894 match from CRWC, Local Trout Unlimited Chapters, Metro-West Steelheaders, Yates Cider Mill and City of Rochester Hills

START/END DATE: Spring 2018 - Spring/Summer 2020

The Clinton River at Yates Restoration was funded in 2018 by the MDNR and serves as phase one of a future multi-phase project which includes restoration of nearly 2,500 feet of the Clinton River located in Rochester Hills. The funded portion of this project includes restoration of 495 feet of the river just downstream of Yates Cider Mill. This section has experienced severe erosion and bank compaction in years past from high foot traffic. This project will include habitat improvements, bank stabilization, native plantings and designated angler access locations.

Construction is set to begin in fall 2019 and the project will be completed in spring 2020 with additional follow up planting events continuing past the construction period. Lateral angler access points will be established via steps allowing for access to the river while also protecting the bank from trampling. Habitat features include rough toe structure and a j-hook vane to help protect the downstream bank from high flows and maintain pool depth. In addition, invasive species removal and native vegetation plantings will help to promote the native ecosystem and reduce water temperatures in future years.

CRWC has collected pre-construction data onsite and has worked with state agencies to expand monitoring efforts along the project reach. Data collected includes habitat and macroinvertebrate indices, mussel surveys, invasive species inventories, large woody debris inventories, bedform mapping, temperature monitoring and fish surveys. This sampling will be continued through the duration of the project and following project completion. CRWC intends to continue efforts to restore this 2,500 foot stretch of the Clinton River into future.



Current conditions

Clinton River Corridor Habitat Restoration

Utica & Sterling Heights, MI

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

ENTITY RECEIVING FUNDING: City of Utica & City of Sterling Heights, Michigan

BUDGET: $4.5 Million

START/END DATE: Summer 2015 - Summer 2019

The Clinton River Corridor Habitat Restoration project was one of eleven projects funded by the USEPA in the Clinton River Area of Concern. This project consisted of habitat and bank stabilization improvements along a nine mile corridor of the Clinton River main branch. The project was within two southeast Michigan communities, The Cities of Utica and Sterling Heights. The project restored connectivity and long term stability to the heart of the Clinton River and made the stretch navigable by paddlers for the first time since the 1970s.

As part of the corridor project, 25 log jams were removed along with 45 fallen trees which were repurposed for vane structure and large woody debris habitat. A total of 25 log vanes were installed as natural structure and bank stabilization and protection. The project stabilized 7, 600 feet of eroding banks along the river. This will help to reduce up to an estimated 230,000 tons of sediment from entering the Clinton River via bank erosion. The reduction in sediment loading will allow for further fish spawning opportunities and increase habitat quality for many flora and fauna of the region. Since completion of construction a large increase in public engagement and recreational use of the river can be seen in the watershed.

As part of this project CRWC conducted extensive monitoring of fish and wildlife habitat before, during and after project completion. The data collected was included in reporting to the USEPA and the state of Michigan. Data collected included invasive species inventory, habitat indices, macroinvertebrate indices, bank erosion hazard index (BEHI) and temperature monitoring. CRWC intends to continue to monitor the success of this project along with the other eleven funded projects under the Clinton River area of concern for the coming years.

Before *After*

Riffle and toewood

Toewood

Sterling Relief Drain Daylighting

Sterling Heights, MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI), National Fish and Wildlife Foundation (NFWF) Sustain Our Great Lakes (SOGL), U. S. Department of Agriculture, Forest Service (USDA-FS)

ENTITY RECEIVING FUNDING: Macomb County Public Works

BUDGET: $1.25 Million USEPA, $650,000 NFWF (SOGL), $45,000 (USDA-FS) Green Macomb initiative

START/END DATE: Spring/Summer 2018 - Spring/Summer 2020

The Sterling Relief Project was the last project funded through the Area of Concern by the USEPA. Following this the project received $650,000 in additional funding from NFWF via Sustain Our Great Lakes. This project stretches nearly 3 miles through the City of Sterling Heights in Macomb County. Once completed, the Sterling Relief project will enhance habitat and biodiversity while also reducing nutrient loading to the Clinton River and providing stormwater infiltration. The project is currently underway and is to be completed in 2020.

The project will daylight lateral drains along 2.5 miles of the underground Sterling Relief Drain. Using bio-swales, native vegetation and infiltration the project will lead to nutrient reductions and reductions of sediment loading entering into the Red Run and eventually the Clinton River. Estimations of nutrient reductions indicate that nearly 3,488 lbs. of nitrogen and 616 lbs. of phosphates loading will be avoided annually. Additionally, 233,317 lbs. of sediment loading is estimated to be avoided annually as well.

CRWC has conducted pre-construction monitoring and intends to conduct post-construction monitoring following project completion. This data will be reported to USEPA and all parties involved to help communicate the effectiveness of this project. Data collections include habitat indices, macroinvertebrate indices, flow and water quality parameters and water temperature.

Excavation

Pre-construction

Pre-construction

SEMCOG | SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS

Congratulations!

To our member communities actively working to restore and protect the Great Lakes

SEMCOG is proud to support member communities working on water resources management by:

- Implementing the Water Resource Plan for Southeast Michigan
- Providing technical assistance on green infrastructure implementation, stormwater, and increasing tree canopy
- Implementing the Green Infrastructure Vision for Southeast Michigan
- Supporting Green Infrastructure Target Setting and Urban BMP planning in Southeast Michigan
- Providing assistance in updating local codes and ordinances to support flexible green infrastructure alternatives
- Providing access to data and maps that support implementation efforts
- Assisting local governments with identifying funding opportunities
- Facilitating the Huron to Erie Drinking Water Monitoring Network
- Supporting region wide coordinate water infrastructure asset management
- • Working on increasing coordination within Cooperative Invasive Species Management Areas
- • Staying up-to-date on the latest environmental policy and legislative priorities

For more information on any of these activities or to receive our online newsletter called *Environmental Exchange*, please contact the SEMCOG Information Center at infocenter@semcog.org or 313-324-3330.

Developing Regional Solutions

SEMCOG is a regional planning partnership of governmental units serving 4.7 million people in the seven-county region of Southeast Michigan striving to enhance the region's quality of life.

Huron River Watershed Council

The Huron River Watershed Council (HRWC). Together, we protect our home river.

For over fifty years, we have successfully reduced pollution and restored the Huron River. HRWC studies the land and water – with a lot of volunteer help – and shares what we learn. We work with local governments to support their efforts to protect the river system and we teach people ways we can all do our part for clean water. Some of our projects focus on fun by supporting recreation so everyone can enjoy the river. Individuals, businesses, and more than 40 communities support HRWC through memberships and donations. We envision a future of clean and plentiful water for people and nature where citizens and government are effective and courageous champions for the Huron River and its watershed.

What do we excel at? Our programs are designed to make positive, measurable changes in our communities:

- Revitalizing the river
- Measuring the river's health
- Connecting people to the river's natural environment, its history and the communities it touches through recreation on the Huron River National Water Trail
- Identifying the best natural areas to slow and filter runoff
- Raising public understanding of emerging concerns like PFAS and microplastics pollution
- Teaching kids watershed science
- Encouraging change makers to use their voice at the local level to influence the future of water
- Preparing for a new climate
- Capturing rainwater in urban areas
- Empowering farmers to improve water quality
- Advocating for safer alternatives to high-PAH toxic pavement sealants

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River Roundup *(photo credit John Lloyd)*

Huron River Day in Ann Arbor
(photo credit Karissa Brumley)

Paddlers at Huron River Day, Gallup Park
(photo credit City of Ann Arbor)

Improving Ecological Integrity & Climate Resilience in Norton Creek

Wixom, MI

FUNDING SOURCE: Wildlife Conservation Society's Climate Adaptation Fund made possible by the Doris Duke Charitable Foundation

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $238,836

START/END DATE: November 2016 - October 2018

Norton Creek is a headwater tributary to the Huron River. The State of Michigan declared Norton Creek an impaired watershed because of extremely low dissolved oxygen levels and high total suspended solids. HRWC completed a two-year investigation into root causes of the impairment and is now developing a watershed management plan providing a roadmap to recovery.

At the same time, University of Michigan researchers assessed the Huron River watershed for future flood risk and ranked sub watersheds to identify places more likely to be impacted by floods in the future. Norton Creek ranked high for future flood risk.

Through stream channel restoration and green infrastructure (GI), HRWC will create conditions in Norton Creek to allow the biological community to recover and be resilient to increased precipitation, and the runoff and flooding that result. These strategies have the potential to mitigate impacts of climate change in both the natural and built environment and achieve water quality improvements vitally important to the restoration of Norton Creek.

Work was completed with significant input from the City of Wixom and area residents to achieve a greater understanding in the area about issues related to the creek and what actions can be taken to support improvements to the river and reduce the vulnerabilities of the community to climate change impacts.

OUTCOMES

1. 500 meters of restored river channel within a natural area that supports floodplain function.
2. Watershed-wide GI map for local municipalities to use to as a guide for improved stormwater management.
3. Two green infrastructure projects in a public park with opportunity to educate area residents.
4. Increased understanding among city staff and residents of water quality impairments, vulnerabilities to climate change and actions that will lead to river recovery and climate preparedness.

Outputs of the project will provide communities with a roadmap to achieving watershed scale climate resilience and an understanding of climate impacts and the strategies that can be employed to protect the creek and residents of the creekshed. Within the course of this project, HRWC will make tangible gains toward achieving a resilient Norton Creek through the completion of a stream restoration project and two urban green infrastructure projects.

Volunteer tour

Norton Creek streambank

Rain garden installation

Norton Creek planting day

Reducing Bacteria in Honey Creek

Scio Twp., MI

FUNDING SOURCE: Michigan Department of Environmental Quality Nonpoint Source Pollution Program

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $200,413

START/END DATE: November 2016 - October 2019

Portions of the middle Huron River watershed, including Honey Creek, fail to meet minimum water quality standards or provide designated uses. Honey Creek is listed as impaired by the state due to elevated bacteria levels (E. coli). A watershed management plan identified some "critical areas" of the watershed had much higher bacteria concentrations than others.

To address the bacterial contamination within Honey Creek and reduce inputs from this tributary to the Huron River downstream, HRWC is implementing several reduction strategies. In addition, monitoring will be conducted after strategy implementation to see where gains are being made.

The four strategies include:

1. Identify and encourage the elimination of human sources. Canine detection will be used to identify failing septic systems followed by homeowner outreach.
2. Educate residents and farmers about pathogen problems and how they can help. A broad suite of outreach and education materials will be delivered to these audiences primarily within "critical areas."
3. Reduce pet waste entering storm systems. A combination of regulation, education and infrastructure will be used to reduce pet waste inputs to Honey Creek.
4. Evaluate the success of these efforts to guide future investments. Year three will involve extensive monitoring and analysis to gage progress.

OUTCOMES

This project is unique in that there is a high likelihood that the outcome will be a removal of human-sourced pathogens and a significant reduction in overall bacteria levels in Honey Creek. Given the level of contamination in the creek, it is quite possible that the pathogen impairment could be completely removed and the creek returned to full beneficial use status. It is a goal to have this project serve as a model to follow for reducing bacteria levels in similar watersheds around the state.

Canine detection of failing septics in Honey Creek (photo credit Stevi Kosloskey)

Honey Creek

Volunteers

Green Stormwater Infrastructure in Swift Run

Ann Arbor & Ann Arbor Twp., MI

FUNDING SOURCE: State of Michigan Department of Environment, Great Lakes and Energy (EGLE) Clean Water Act Section 319

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $830,300 grant, $207,200 match by Washtenaw County Water Resources Commissioner & City of Ann Arbor

START/END DATE: October 2014 - September 2018

Swift Run (in the City of Ann Arbor and Ann Arbor Township) is an urbanized tributary to the Huron River that is impaired by flow alteration, sedimentation, high bacteria, and high phosphorus levels. The goal of the project was to broadly install Green Stormwater Infrastructure (GSI) practices throughout a 3-block residential neighborhood with no previous stormwater treatment, to improve flow dynamics, reduce streambank erosion, and reduce phosphorus runoff.

The project changed significantly due to several barriers and constraints, and implementation was broadened to the full Swift Run watershed. In the end, thanks to the work of project partners, three large-scale sets of practices and numerous small-scale practices were implemented. Large-scale GSI practices were installed with the help of partners including Forestbrooke Athletic Association, Ann Arbor Public Schools (Mitchell Elementary School) and Washtenaw County.

In addition to the significant GSI projects, HRWC and partners carried out a multi-faceted education plan to inform Swift Run residents in the target neighborhood about the problems with altered hydrology, polluted runoff, their role in the problems, and proposed solutions. Following the education, watershed knowledge improved and 82% of residents supported the project.

OUTCOMES

- 9 large rain gardens infiltrating 7,500 cf of runoff
- 4,900 sf of porous paving with 2,400 cf of runoff storage for infiltration
- 7 right-of-way rain gardens capturing 807 cf of runoff
- 10 residential rain gardens capturing 610 cf of runoff
- Annual load reductions of 2.5 lbs of phosphorus, 10 lbs of nitrogen, and ½ ton of sediment

Planting day

Watering newly planted rain garden

Planting day

Whole Farms for Clean Water

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

ENTITY RECEIVING FUNDING: Huron River Watershed Council

BUDGET: $812,318 GLRI Grant, $162,965 from Solutions In The Land, ECT, Ohio State University, UofM, and Huron River Regional Conservation Partnership which includes the Washtenaw County Conservation District, Washtenaw County Water Resources Commissioner, and Natural Resource Conservation Service

START/END DATE: July 2017 - December 2020

HRWC has launched a new project aimed at reducing phosphorus runoff from agricultural lands. Whole Farms for Clean Water seeks to empower farmers to minimize soil erosion and nutrient losses from their fields. The project uses a data-driven model, flexible and cost-effective conservation techniques and incentive payments to farmers for reductions in phosphorus. More than that, it will invest in the success of participating farms by providing each with a tailored business plan. These Whole Farm Plans will recommend new markets and long-term approaches for profitability across the entire farm operation.

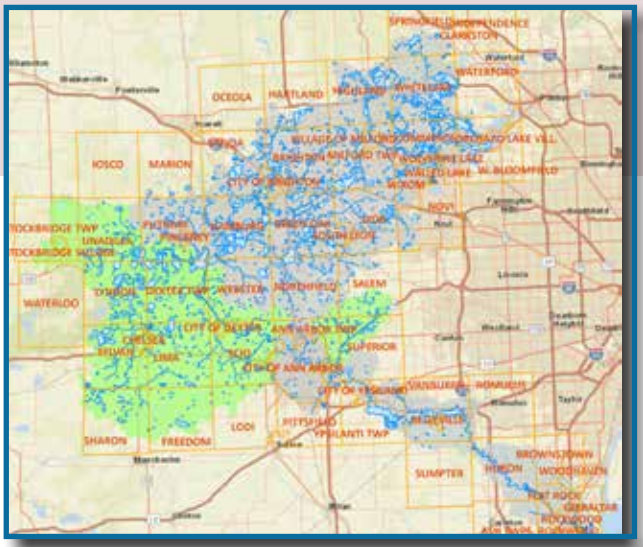
The project's innovative approach uses a nutrient flux model that relies on HRWC chemistry and flow monitoring data and local economic information. The model can predict the expected phosphorus reduction from a specific conservation practice applied to any field the farmer chooses. Project target areas include the Mill, Honey, Boyden, Fleming, and Portage creeksheds within the Huron River watershed.

The project's team of agricultural consultants, agronomists, modelers, and water resources professionals will encourage participation by agricultural producers and provide them with reduction-based payments to implement strategic, farm-specific Best Management Practices (BMPs) identified by the model. Targeted BMPs under consideration by the team include but are not limited to erosion reduction, fertilizer runoff reduction, manure runoff reduction, and overall nutrient management.

ANTICIPATED OUTCOMES

- Educating farmers on nonpoint source phosphorus pollution and strategies to reduce runoff
- Providing areas farmers with whole system farm plans to guide future conservation-related decision-making
- Implementing agricultural BMPs to maximize sedimentation and nutrient load reductions resulting in the annual removal of 10.5 tons of phosphorus from entering Lake Erie
- Assisting farmers with BMP implementation
- Strengthening local markets that utilize secondary crop products from BMPs

Filter strips *(photo credit NRCS)*



Whole Foods for Clean Water project area

Everything we do on land **matters**

Everyone lives on waterfront property because everything people do on their land – no matter if it's located on a river or lake or simply dry land – ends up in one of the Great Lakes. Together with the Nature Conservancy, we created a new map of the Great Lakes, color coding every drainage basin (watershed) in our region to demonstrate that, no matter where you are located, you are in a watershed.

Thank you to the region's U.S. Senators and Representatives for supporting the Great Lakes Restoration Initiative (GLRI) and to the many organizations and businesses working tirelessly to improve our communities and watersheds.

Download a high-resolution version of the map here:
www.erbff.org/programs/great-lakes/great-lakes-watersheds-map

www.erbff.org | Follow us on Twitter @ErbFamilyFdn

Fred A. and Barbara M.
Erb Family Foundation

Alliance of Downriver Watersheds

The Alliance of Downriver Watersheds (ADW) is a permanent watershed organization in southeast Michigan and formed under Public Act 517 of the Public Laws of 2004. The ADW formally established themselves in 2007 but have been working together for many years to manage the area's water resources.

The ADW consists of 23 public agencies in the Ecorse Creek, Combined Downriver and Lower Huron River Watersheds within Wayne and Monroe Counties. The ADW is relatively urban in nature consisting of 203.3 square miles and more than 450,000 people (2010 census). Major watercourses within the ADW that drain to the Detroit River and Lake Erie include the Ecorse Creek, Sexton Kilfoil Drain, Frank and Poet Drain, Blakely Drain, Brownstown Creek, Huron River, Silver Creek and Woods Creek.

The consortium of agencies that make up the ADW meet on a regular basis and work together to cooperatively manage the rivers, lakes and streams within the watershed. Examples of ADW efforts include:

- Long-term water quality monitoring
- Stormwater permit compliance
- Reporting to the State
- Submittal of grant applications for water quality improvements
- Public education on items such as rain barrel use, no phosphorus fertilizer, and proper pet waste management.

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Water quality monitoring efforts

Invasive Species Management

Southeast MI

FUNDING SOURCE: Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Alliance of Downriver Watersheds

BUDGET: $15,000

START/END DATE: 2015 - 2017

The Alliance of Downriver Watersheds worked to secure and implement this Great Lakes Restoration Initiative project. This invasive species investigation and education project evaluated municipally-owned facilities in 23 Downriver communities for presence and density invasive species. Field collected data was used to map and prioritize sites for future treatment.

Along with municipal invasive species surveys, the ADW engaged community members through a public workshops promoting citizen science and the use of the Midwest Invasive Species Identification Network (MISIN). The workshops covered invasive species biology and identification as well as impacts and modes of treatment for several common terrestrial invasive plant species that impact ADW communities.

Invasive species identification workshop

Purple Loosestrife

Phragmites

Emerald Ash Borer Restoration

Gibraltar & Van Buren Twp., MI

FUNDING SOURCE: Great Lakes Restoration Initiative (GLRI)

ENTITY RECEIVING FUNDING: Alliance of Downriver Watersheds

BUDGET: $20,000 & 75 volunteer hours

START/END DATE: 2016 - 2017

In September 2017, utilizing funds through the U.S Forest Service, the Alliance of Downriver Watershed (ADW) community members Gibraltar and Van Buren Township planted a total of 50 trees to mediate stormwater runoff in their respective communities.

The tree planting events took place over two days and utilized the help of both city employees and volunteers from the Social Forestry Project and OHM-Advisors. Volunteers donated a total of 75 hours to help make these tree planting events a success.

Maintenance of the trees, which included staking, watering and corrective pruning was performed by city employees over the following year to ensure successful establishment of the trees.

These trees will provide ecosystem services valued at $2,500 annually to the ADW communities for years to come.

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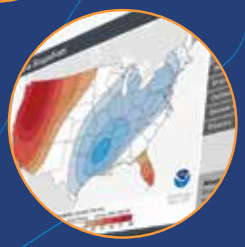

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Friends of the St. Clair River

Organization Introduction
Established in 2007, Friends of the St. Clair River is Michigan's Thumb Coast destination watershed organization.

Friend's mission is to inspire citizen action through stewardship, monitoring and education to restore, protect and enhance the St. Clair River and its watersheds. We are committed to healthy rivers, green spaces and water-based recreation that's balanced with economic and environmental priorities to protect and promote our unique natural resources.

Friend's core pillars are (1) Land Stewardship, (2) Environmental Education and (3) Watershed Management. Through land stewardship we manage quality native habitat projects, lead hands-on field sessions, and conduct citizen science monitoring. Through our environmental education program we deliver place-based presentations and tours in the classroom and in the field. Our flagship programs are the annual Blue Water Sturgeon Festival and Adopt-A-Sturgeon.

Friends oversees the St. Clair River Area of Concern program, which has made tremendous progress restoring eight of the river's ten impairments. We participate in county-wide watershed planning efforts and restoration projects like streambank stabilizations, river clean-ups and native mussel surveys. Priorities include restoring the Area of Concern status, securing funds to implement watershed plans and supporting water and land trail recreational programs.

The St. Clair River basin is unique in its makeup. On its American side it is comprised of seven distinct watersheds spanning 1,000 inland river miles and 58 shoreline miles on Lake Huron, the St. Clair River and Lake St. Clair. The watershed boasts the largest threatened Lake Sturgeon population in the Great Lakes, has ten islands six of which are Canadian Walpole Island First Nation, forms the largest freshwater delta in North America, and provides eleven million gallons of drinking water to 60% of county residents.

Friend's is supported by donations, contracts, sponsorships and grants. These investments, from our Michigan and Ontario partners, provide the conduit for us to build thriving ecosystems alongside waterfront investments that boost our quality of life. Our passion runs deep for making the St. Clair River a destination watershed!

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St. Clair River Blue Water River Walk

Friends Volunteer Stream Team


St. Clair County Wetlands County Park

Sturgeon Science School

St. Clair River Watershed

FUNDING SOURCE: Various Sponsorships & Grants

ENTITY RECEIVING FUNDING: Friends of the St. Clair River

BUDGET: $15,000

START/END DATE: 2012 - Ongoing

Developed by Friends of the St. Clair River, Sturgeon Science School is a place-based youth education initiative that delivers stewardship and conservation messages to 1,500 St. Clair County fifth grade students to celebrate the Lake Sturgeon success story. The St. Clair River corridor supports the largest spawning sturgeon population in the Great Lakes giving Friends of the St. Clair River the upper hand to lead this initiative.

Semester-long classroom and field elements are blended together to create a unique three-part experience for students on land and water. The curriculum, aligned with Michigan's education standards, deepens student's understanding of scientific ideas by highlighting the significant role researcher's play in the health of the Great Lakes. Collaborations with local, state and federal partners provide unique opportunities for the students to interact face-to-face with fisheries biologists "on the job".

St. Clair County classrooms adopt a Lake Sturgeon from the St. Clair River and, in turn, receive a visit from Friends staff with their adoption package. This symbolic Lake Sturgeon adoption introduces students to local sturgeon research and habitat monitoring with a custom video produced by the Great Lakes Fishery Commission and an invitation to participate in the Sturgeon Story Contest.

The classroom portion culminates with a Sturgeon Science Cruise aboard local sightseeing boat, the Huron Lady II. During the educational cruise, students engage with scientists giving an interpretive talk about native fish, like Lake Sturgeon, and invasive species, like Sea Lamprey, and learn about their research and significance. The highlight is meeting a U.S. Fish and Wildlife Service boat with sturgeon caught and tagged to understand migration patterns and spawning reef use. The field experience also includes a guided walking tour on St. Clair River's shoreline to provide fisheries-focused activities, like fish egg and larval sampling and tagging.

Sturgeon Science School leads up to a free, public festival every June that attracts thousands of visitors to experience a close encounter with the Great Lakes' iconic Lake Sturgeon. The Blue Water Sturgeon Festival is an immersive event that showcases the Blue Water Area's environmental, recreational and cultural resources by blending together demonstrations, workshops, exhibits, artisans, and activities. Program details can be found at www.SturgeonFestival.com.

Huron Lady sturgeon science cruise

Blue Water Sturgeon Festival

Sturgeon Science School presentation

St. Clair River Area of Concern Coordination

St. Clair River Watershed

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

ENTITY RECEIVING FUNDING: Friends of the St. Clair River

BUDGET: $22,000 Annually

START/END DATE: 2010 - Ongoing

In response to the creation of the Areas of Concern program, numerous and diverse partners came together in the late 1980's on both sides of the international St. Clair River to form the St. Clair River Binational Public Advisory Council (BPAC). BPAC was charged with developing the river's Remedial Action Plan (RAP) – a road map to restoring the river's health – and securing funding to implement the plan. As a result, Friends of the St. Clair River (Friends) was incorporated in 2007 to serve as the non-profit arm supporting BPAC on the American side of the river. Similarly, a non-profit organization was developed on the Canadian side of the river.

Thanks to this partnership substantial progress was made to the river's health, including a boost from GLRI funding in 2010 exceeding $21 million. To date, on the American side of the river, eight of the original ten BUIs have been redesignated to a "not impaired" status. Early restoration wins were: Tainting of Fish & Wildlife Flavor in 2011, Added Costs to Agriculture & Industry in 2012 and Degradation of Aesthetics in 2016. The Restrictions on Drinking Water impairment is set to be restored in 2020. Fish Consumption will be the last impairment remaining. The goal is delist the St. Clair River as an Area of Concern by 2025.

Restoration of the beach closings impairment in 2015 was made possible by reducing pathogen sources through infrastructure improvements separating 48 of 49 Combined Sewer Outfalls, elimination of illicit discharges, and creation of green infrastructure projects at a local community's riverfront beach.

Studies looking at PCBs, mercury and other contaminants in tree swallows, fish and mink indicated populations were no longer being adversely impacted by legacy chemical pollution, leading to the restoration of the Bird and Animal Deformities & Reproductive Problems impairment in 2017.

Additional roles Friends fill for BPAC are public communications liaison, marketing coordinator, and public outreach programmer. Signature events include BUI restoration celebrations, the Blue Water Sturgeon Festival, and partnership award plaques recognizing individuals and organizations contributing to successful restoration efforts.

This tremendous effort is due to the successful collaboration of many federal, state and local partners including Friends of the St. Clair River, St. Clair County Health Department and the St. Clair River BPAC. Although great progress has been made over the last thirty years, there is still more work to be done until the St. Clair River's health has been restored.

AOC Celebration partnership award ceremony

AOC Celebration event

Land Stewardship Program

St. Clair River Watershed

FUNDING SOURCE: Great Lakes Restoration Initiative (GLRI), Community Foundation of St. Clair County, St. Clair County Community College, St. Clair County Parks and Recreation

ENTITY RECEIVING FUNDING: Friends of the St. Clair River

BUDGET: $40,500 Annually

START/END DATE: 2015 - Ongoing

A historic milestone was achieved in 2017 with completion of twelve projects along the St. Clair River shoreline to restore habitat for fish and wildlife as part of the Area of Concern program. As a result, Friends stepped into the role of coordinating land stewardship for these completed habitat projects. With Stewardship Services Agreements in place with three property managers, Friends manages the projects for volunteer capacity, habitat management and citizen science, and educational programming.

Hands-on stewardship field work sessions take place around the watershed throughout the year to clean up trash and debris and remove invasive species along river shorelines. Volunteers Stewards gather for social fun and to learn about, advocate for and manage habitats and green infrastructure for people, plants and wildlife. Example stewardship programs include River Walkers and Trash Talkers, Field Days, Watershed Walks, and Family Stewardship.

The citizen science programs help us understand watershed health using an ecosystem-based approach to gathering data about plants and wildlife. Businesses, families, schools and youth groups contribute to valuable research, connect with nature, and learn about our watersheds. We provide the training and equipment for a variety of programs including Stream Leaders, Butterfly Monitoring, Storm Drain Marking, Adopt A Beach, and Native and Invasive Species Tracking.

The Land Stewardship program is primarily funded by contracts to public landowners, which are renewed on a calendar year basis. Examples of the landowners include St. Clair County Parks and Recreation Commission, Community Foundation of St. Clair County, and St. Clair County Community College. Matching funds are received from federal, state and local grants, sponsors, and donations.

Invasive species removal

Rain garden educational program

Stewardship volunteers

Kawkawlin River Watershed Association

The Kawkawlin River Watershed Association (KRWA) was formed in 1993 with the objectives of promoting and advocating for watershed issues in the Kawkawlin River basin. Primary among these issues include recreation, safety, education about watershed issues, and the conservation and protection of water quality.

To that end, the KRWA sponsors several events and projects that increase appreciation of the Kawkawlin. These projects include a long-term water monitoring effort, the placement of channel marker buoys for recreational boaters, an annual river cleanup event, an annual kayaking event, installation of a kayak launch for the public to enjoy, promotion of establishment of a special assessment district to fund treatment of weeds, a website, and the publication of a quarterly newsletter. The KRWA also works in the interest of watershed residents and property owners with regard to issues such as dredging and marine and winter safety patrolling of the navigable area of the river.

The association's representation in governmental projects such as river restoration, water quality and e-coli issues are important to everyone; especially those of us who live along the river. Water quality, navigability and weed control are at the forefront of KRWA attention. Over the years, valuable relationships with local and state entities have been imperative in achieving watershed goals. The KRWA continues to work closely with numerous partners including:

- Saginaw Valley State University (SVSU)
- Delta College
- University of Michigan (Flint)
- Bay County Conservation District
- Kawkawlin Township
- Monitor Township
- Bangor Township
- Michigan Department of Environment, Great Lakes and Energy (formerly MDEQ)
- State of Michigan

KRWA was also present in the creation of a speed limit for ATVs and snowmobiles to help improve safety of those who enjoy the river. We are very proud of our accomplishments, but we also like to have some fun!

The KRWA currently has approximately 150 members who subscribe at a minimum of $25.00 per member per year.

The Kawkawlin River Watershed drains nearly 250 square miles in four counties (Bay, Midland, Gladwin, and Saginaw) and contains land area in 14 townships.

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Kawkawlin River North Branch Ecosystem Restoration (Phase I)

Bangor Twp., MI

FUNDING SOURCE: State of Michigan Waterways Emergency Dredging Fund

ENTITY RECEIVING FUNDING: Bangor Township

BUDGET: $1,100,000

START/END DATE: 2015 - Ongoing

The GLRI Action Plan identifies the Saginaw Bay Watershed as an area to receive focused restoration activities with specific progress measures. The Kawkawlin River discharges directly to the Saginaw Bay, and therefore, has substantial impacts on the nearshore area of the inner Bay. This project included funding allocated through the Michigan Waterways Emergency Dredging Fund. This work is currently underway, including completion of the dredging at the mouth of the Kawkawlin River where it discharges into Saginaw Bay. The overall goal of the dredging funds, as outlined by the State, is to assess current river conditions, determine impaired areas, propose restoration design, and implementation.

Based upon field data obtained in 2016, the project initially focused on the restoration efforts in the north branch. In July of 2017, field staff mapped the debris blockage along the north branch of the river and observed river conditions. Along the north branch, 14 points of debris and 5 abandoned oil and gas pipelines were observed and evaluated for potential removal. Wetland and invasive species specialists reviewed the data / observations and compiled a data acquisition plan. These specialists mapped the wetlands and invasive species along the river, including on-the-ground verification, to compile necessary mapping for project permitting.

Section of north branch before removals

Completed in 2018, Kawkawlin River Ecosystem Restoration Phase I funds allowed for removal efforts in the north branch, reinstating safe recreational passage and removing flow restrictions. Work included:

- Completion of an engineering study design boundary upstream
  - Wetland assessment
  - Threatened & endangered species assessment
  - Sediment sampling
  - Debris mapping
- High erosion/future debris issue assessment
- Engineering and permitting
- Remove upstream sediment to clear impassable waterways, and support the Blue Water Trail for the kayak community
  - 1,500 cubic yards of debris removed and hauled out of the river
- Additional dredging activities, including debris and abandoned pipeline removal in the north branch
  - 4 abandoned pipelines safely removed from the north branch and capped
- Continue with holistic approach to the project and support the overall health of the Kawkawlin River

Section of north branch after removals

Kawkawlin River South Branch Ecosystem Restoration (Phase II)

Monitor Twp., MI

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

ENTITY RECEIVING FUNDING: Charter Township of Monitor

BUDGET: $200,000

START/END DATE: October 2016 - September 2019

The Kawkawlin River Ecosystem Restoration Project – Phase II focused on specific portions of the Main and South Branches, extending primarily through Monitor Township (Bay County), Michigan. The project limits extend from the Main Branch and continue upstream into the South Branch. The watershed is plagued by excessive sedimentation issues, leading to highly degraded wetlands and aquatic habitat conditions, as well as decline of important fisheries. This project addresses the most severe erosion issues along the river bank, by use of best management practices such as vegetative buffers, improving the water quality through sediment and nutrient reduction.

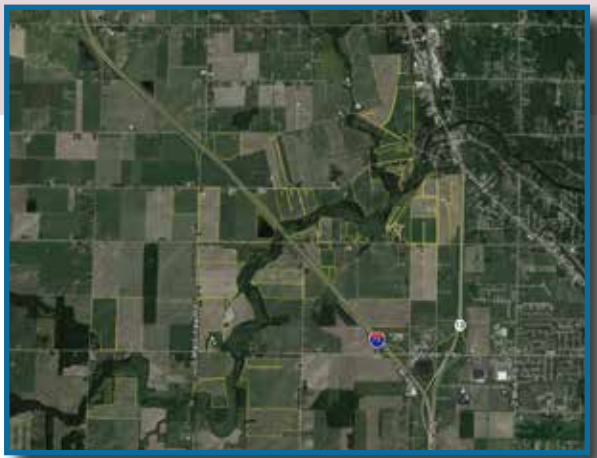
Implemented throughout 2017, 2018 and 2019 this project funding helped plant trees, shrubs, and cover crops in high priority areas within the north and south branches to reduce agricultural stormwater runoff into the river. Reducing runoff is important to limit excess nutrients entering the river, exacerbating algae and invasive species in the system, and degrading the water quality and habitat for fish. Planting additional trees along the river banks will provide shaded areas to further cool the water temperature and help support the fisheries also. Completed in fall of 2019, this funding was used to stabilize high priority rill/gully and v-ditch erosion sites, as well as priority tile outlet erosion sites. The Bay County Conservation District implemented tree and natural vegetation plantings were installed in accordance with the US Forestry Service planting guideline to control erosion/sediment loss, reduce nutrient runoff from agricultural sources and restore tree canopy. Plantings focused on vegetated cover crops to control erosion during nongrowing seasons, as well as 35' vegetative buffer strips along the river. Maintenance and planting warranty are a priority, and will be monitored regularly by Township and Conservation District staff now that implementation is complete.

Trees planted at Steih Park

Project implementation highlights include:

- Approximately 3,100 acres of cover crops
- 212 trees and shrubs implemented
- 11 acres of buffer strips
- 6 v-ditch erosion sites restored

It is anticipated that the proposed tree plantings along the river will uptake approximately 59 gallons of stormwater per day per tree for the highest precipitation months during the spring and fall, or approximately 120 days per year. In addition, approximately 25 acres of green buffer strips will be installed along the highest priority erosion areas will total 623 gallons per year of stormwater runoff reduction during the highest precipitation per year that are prevented from reaching Lake Huron.



Farmland where cover crops implemented

Kawkawlin River Ecosystem Restoration (Phase III)

Bangor Twp., MI

FUNDING SOURCE: State of Michigan Waterways Emergency Dredging Fund

ENTITY RECEIVING FUNDING: Bangor Township

BUDGET: $1,100,000

START/END DATE: 2015 - Ongoing

Bangor Township and the Kawkawlin River Watershed Association (KRWA) are currently preparing to dredge excess material from the mouth of the Kawkawlin River. Dredging of the mouth was recently completed several years ago, funded partially through State of Michigan monies. However, due to several contributing factors, the sediment had built up within the mouth of the river and US Army Corp of Engineers channel as previously maintained. Driving the need for the project is the excessive sediment extending out of the water in the channelized area at the mouth, some areas blocking property owners irrigation intake pipes. The excessive sediment also caused a safety concern for users of the river, creating a difficult channel to mark safely by KRWA volunteers. Areas of the mouth were less than a foot in depth, with the average depth between 2-3 feet. This caused issues with boaters getting stuck and tipping concerns for kayak/SUP users.

In late 2018, Bangor Township and KRWA completed discussions with appropriate state agencies to determine next steps, preliminary design options and permitting timeline in consideration of this proposed project. Data collection efforts commenced in spring 2019 and progress continued with permitting agencies as necessary to comply with existing permit conditions. Project design, bidding and Contractor award has been completed, with bathometric survey working completed late September 2019. Dredging activities are anticipated to start in October 2019.

Tobico Marshland Revitalization: Tributary to Saginaw Bay

Bay City, MI

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

ENTITY RECEIVING FUNDING: Kawkawlin River Watershed Association

BUDGET: $200,000

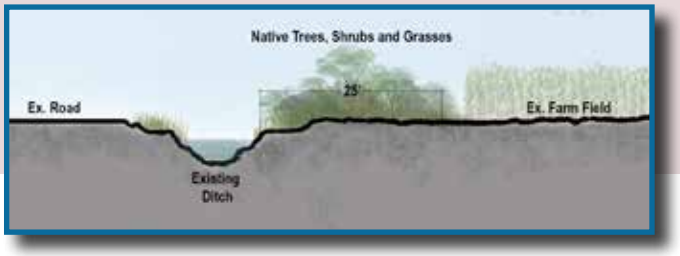
START/END DATE: October 2017 - September 2020

Tobico Marsh is an impaired wetland area located directly downstream from agricultural lands within the Kawkawlin River watershed. Runoff waters from the upland farming areas are laden with excess nutrients such as nitrogen, phosphorus and sediment. Due to poorly infiltrating soils, the runoff waters flow directly into the marshland through a system of road-side drains. From there, the Tobico Marsh drains into the Saginaw Bay, a water body internationally recognized on the Area of Concern (AOC) list. These excess nutrients degrade the Saginaw Bay and contribute to the large algae blooms for which this portion of Saginaw Bay is known.

The Kawkawlin River Watershed Association was awarded the GLRI USDA Forest Service grant to help filter and improve water quality into the Tobico Marsh, and therefore functionality of the marsh itself. This project will improve the quality of the marshland through enhanced filtration by using native plantings to intercept runoff from the upland agricultural lands allowing for additional nutrient uptake, infiltration and transpiration prior to entering the Tobico Marsh.

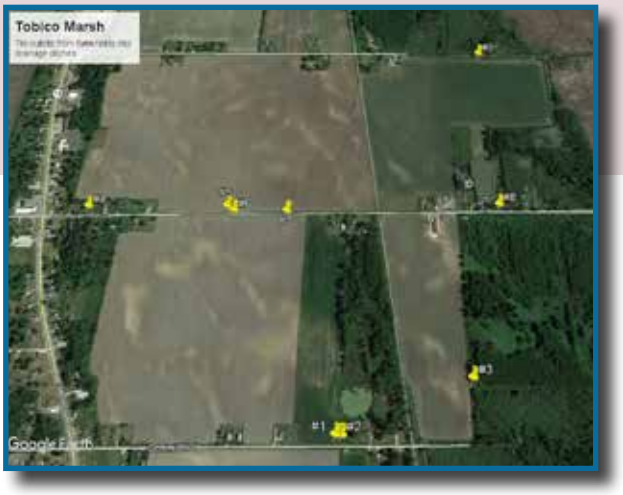
The roots of these plants will also reduce sediment and erosion on the upland portions of the marshland, creating a buffer and reducing the habitual clogging of the culverts within the Tobico Marsh areas - restoring the hydraulics. These plantings will also support additional flood storage and wildlife habitat. A mix of native species such as red-osier dogwood, gray dogwood, elderberry, switchgrass, little bluestem, and big bluestem will likely be selected for the proposed buffer strips. It is anticipated that these native trees, shrubs and grasses will uptake approximately 30 gallons of runoff water/day per tree for approximately 120 days/year.

KRWA is working with partners including the Michigan Department of Natural Resources, Bay County Conservation District, Bay County State Recreation Area, Saginaw Valley State University (SVSU), Bay County Drain Commissioner and local farmers to identify project goals and potential planting areas. SVSU has completed pre-implementation monitoring for baseline water quality assessment and will do so again post-implementation to gauge project success. Design was completed in spring of 2019, and implementation began in the summer of 2019.



Typical cross section buffer strip concept

Typical cross section trench concept



Tile outlet locations for implementation

Saginaw Bay Reef Restoration

Saginaw Bay, MI

FUNDING SOURCE: U. S. Environmental Protection Agency

ENTITY RECEIVING FUNDING: Michigan Department of Environment, Great Lakes, and Energy (EGLE), Remediation and Redevelopment Division (RRD)

BUDGET: $1,476,000

START/END DATE: Summer 2019 - Fall 2019

Land use changes, including logging and agriculture, caused sedimentation buildup and contributed to the loss of reef habitat in the inner Saginaw Bay, Michigan. The loss of reef habitat contributed to the collapse of Saginaw Bay's walleye fishery and negatively impacted local populations of lake whitefish, lake trout, burbot, and other species.

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) – Remediation and Redevelopment Division (RRD) is developing a 2-acre reef restoration design for the construction of the Coreyon Reef in Saginaw Bay. The reef is designed based on lessons learned from natural and restored reefs within the Great Lakes, including the recent Detroit River reef project (Vaccaro et al. 2016), Thunder Bay reef restoration project, and the Elk Rapids (Grand Traverse Bay) reef restoration project.

Constructing new fish spawning reefs will lead to greater stability of fish species native to Saginaw Bay. This project will also help to diversify spawning habitat and facilitate a more resilient and diverse fish population. Currently, Saginaw Bay's Walleye fishery is mainly sustained by river-based spawning within one or two rivers. Leaving the fishery vulnerable to events that might harm spawning success within these rivers. Restoring the bay's reefs will help to address this vulnerability by diversifying the type and location of spawning habitat.

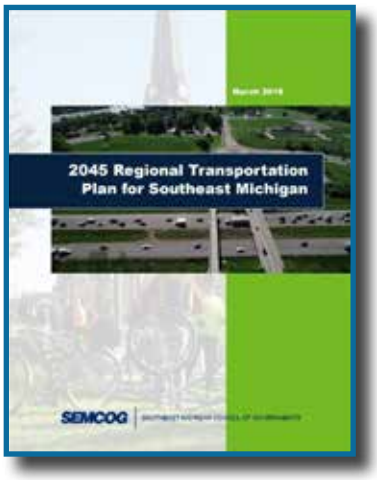
Project highlights:

- Create 2-acres of lost rock reef spawning habitat
- Help facilitate a resilient and diverse fish population
- Serve as a demonstration project for future reef restoration in the Great Lakes

Southeast Michigan Council of Governments

The Southeast Michigan Council of Governments (SEMCOG) is a regional planning partnership that supports coordinated local planning with technical data and intergovernmental resources to over 170 units of local government across 7 counties in Southeast Michigan (Washtenaw, Livingston, Oakland, Wayne, Macomb, St. Clair, and Monroe Counties). SEMCOG's plans improve the quality of the region's environmental resources, make the transportation system safer and more efficient, revitalize communities, and encourage economic development.

As a Council of Governments, the Metropolitan Planning Organization, and the Designated Air and Water Quality Management Agencies for the region, SEMCOG's plans improve the quality of the region's environmental resources, make the transportation system safer and more efficient, revitalize communities, and encourage economic development.



As the regionally designated water quality management for Southeast Michigan under Section 208 of the Clean Water Act, SEMCOG has developed multiple plans to support the water and green infrastructure related planning efforts within the region. Published plans include the Water Resource Plan for Southeast Michigan, the Green infrastructure Vision for Southeast Michigan, the Great Lakes Green Streets Guidebook, and the Low Impact Development Manual for Michigan. SEMCOG also helps support ongoing Phase II compliance by facilitation the Southeast Michigan Partners for Clean Water group.

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One Water Campaign for Southeast Michigan

Southeast MI

FUNDING SOURCE: Michigan Department of Transportation, Great Lakes Water Authority

ENTITY RECEIVING FUNDING: Southeast Michigan Council of Governments

BUDGET: $250,000

START/END DATE: July 2018 - June 2019

Public education on the water infrastructure system is becoming increasingly important, as changing climate patterns and aging infrastructure continue to impact our water system. Public understanding of how our water system works can lead to investment and increased public care of the water system. In 2019, SEMCOG, in partnership with Great Lakes Water Authority and the Cranbrook Institute of Science, launched the One Water Campaign for Southeast Michigan. The goal of this campaign was to attain a greater awareness and mutual shared responsibility for water resources and to create public support for investments in water resources and infrastructure asset management.

Campaign messaging largely focused on the connection between stormwater, drinking water, and wastewater. The goal was to help the public understand the connection between the water system, the vastness of the system, and that public involvement plays a role in maintain and improving the water system. A campaign advisory group was assembled, with water experts from watershed groups, consultants, scientists, and marketing analyst, to help develop One Water messaging. Stormwater messaging focused on only letting rain down the stormdrain, and what the public can do to prevent chemicals, pet waste, and other pollutants from entering the water system. Flushable wipes and Fats, Oils, and Grease were the focus of the wastewater messaging, ensuring proper disposal of these items. Drinking water messaging worked to gain investment and trust from the public, discussing the importance of the operators that treat our water and their job in providing water to our homes.

The campaign ran from June 1-9, 2019, and made quite an impression on the region. Outdoor advertising, video and radio ads, and social media were all outlets for disseminating this information. 13.7 million impressions were received via outdoor advertising, including billboards and bus ads. 66 communities used One Water videos on their local TV stations. 120 broadcast TV spots were purchased, receiving 1.3 million impressions. On social media, the campaign received 491,000 video views, 2,1375 shares and retweets, and 3,453 link clicks. These impressions help show the impact of the One Water campaign.

We all have a role and responsibility in the water system. By continuing this public education campaign throughout the region, we can help build an understanding of the connections in our water system and how we can keep it fresh and flowing.

onewater
Keep it fresh. Keep it flowing.

Water Resource Plan for Southeast Michigan

FUNDING SOURCE: Michigan Department of Transportation

ENTITY RECEIVING FUNDING: Southeast Michigan Council of Governments

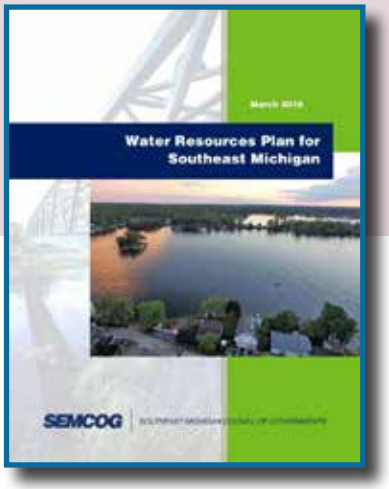
START/END DATE: April 2016 - March 2018

As part of the Great Lakes State, Southeast Michigan's lakes, rivers, and wetlands define the region's geography and are essential to its economic health, attracting visitors, and enhancing quality of life for residents. With over 1,000 inland lakes, 4,000 miles of river and streams, 341,000 acres of wetlands, and 400 miles of freshwater shoreline, Southeast Michigan is an important area for water resources. Water resources provide the 4.7 million residents in Southeast Michigan with drinking water, economic opportunities, and recreational access. The major river systems include the Clinton, Detroit, Huron, Raisin, Rouge, and St. Clair Rivers. This abundance of fresh water is a key economic driver attracting business investment and talent.

In March 2018, SEMCOG released the Water Resource Plan for Southeast Michigan. This plan builds ups upon two prior plans – the 1978 and the 1999 Water Quality Plans for Southeast Michigan. While this plan builds upon these plans and ongoing regional initiatives, its focus is on integrated water resources management, including advancing the blue economy, natural resource protection and enhancement, and water infrastructure systems. The plan focuses on the quality and the sustainability of the region's water infrastructure system, and plans for a resilient future for water resources and their connection with people and the environment.

This plan consists of three main chapters focused on the major aspects of water planning in Southeast Michigan – the Blue Economy, Natural Resources, and Infrastructure. This integrated water resources management approach sets the framework for 28 regional policies that address the core challenges in the region, while supporting ongoing achievements in protecting and restoring Southeast Michigan's water assets. To implement these policies and sustain this plan, recommended actions are provided.

After a little over a year since this plan's release, SEMCOG continues to implement projects to help support the policies and actions of this plan, as well as work with local communities to enact the vision of this plan. SEMCOG is working to address water infrastructure asset management, climate resiliency, water education, invasive species, and more, through a variety of projects. This plan helps to drive the goals of these projects, and continues to set an example for the region on how to manage our vast and important water resources.



Congratulations to the Projects Winning the 2019 Keep Michigan Beautiful Award

KMB
Keep Michigan Beautiful, Inc.
KEEP AMERICA BEAUTIFUL AFFILIATE

Green Infrastructure in Swift Run, Huron River Watershed Council – The Michigan Plaque

Huron River Watershed Council

Rouge Oxbow Restoration, Wayne County Department of Public Services – The Michigan Plaque

Department of Public Services Wayne County

Stony Island Habitat Restoration, Friends of the Detroit River – The President's Plaque

FRIENDS of the DETROIT RIVER

Great Lakes Commission

Since it was established in 1955 by the Great Lakes Basin Compact, the Great Lakes Commission has worked with its member states and provinces to address issues of common concern, develop shared solutions and collectively advance an agenda to protect and enhance the region's economic prosperity and environmental health.

Our Vision
The Great Lakes Commission is a binational leader and a trusted voice ensuring the Great Lakes and St. Lawrence River support a healthy environment, vibrant economy and high quality of life for current and future generations.

Our Mission
The Great Lakes Commission represents, advises and assists its member states and provinces by fostering dialogue, developing consensus, facilitating collaboration and speaking with a unified voice to advance collective interests and responsibilities to promote economic prosperity and environmental protection and to achieve the balanced and sustainable use of Great Lakes – St. Lawrence River basin water resources.

Our Membership
Our members include the eight Great Lakes states with associate member status for the Canadian provinces of Ontario and Quebec. Each jurisdiction appoints a delegation of three to five members comprised of senior agency officials, legislators and/or appointees of the governor or premier.

The Great Lakes Commission (GLC) is developing and managing several regional collaborative partnerships to restore and protect habitat for fish and wildlife, support the remediation of degraded areas, and ensure resiliency to changing lake levels and impacts from climate change. The GLC coordinates regional engagement, improves management, advances research, and facilitates communication and outreach to address coastal conservation challenges.

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Little Rapids Restoration

Chippewa County, MI

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

ENTITY RECEIVING FUNDING: Chippewa County Road Commission and the Eastern U.P. Regional Planning & Development Commission

BUDGET: $8,710,695 from NOAA/GLC Regional Partnership

START/END DATE: June 2013 - September 2018

The St. Marys River is a globally unique river that forms the binational connecting channel between Lake Superior and Lake Huron, two of the largest freshwater systems in the world, with shared jurisdiction between the Canadian Province of Ontario and the State of Michigan. Both communities have a strong tourism-based economy that is centered on sport fishing and other recreational activities on the St. Marys River. Despite its popularity for recreation, the St. Marys River is designated as one of Michigan's 14 Great Lakes Areas of Concern (AOCs) due to pollution and habitat alteration. The river is listed for 10 of the 14 Beneficial Use Impairments (BUIs) evaluated under the AOC program, including Degradation of Fish and Wildlife Populations and Loss of Fish and Wildlife Habitat. The Little Rapids Restoration Project addressed these BUIs and is the last habitat project necessary to remove the St. Marys River from the list of AOCs.

Rapids habitat on the St. Marys River has historically been impacted by various forms of development, including dredging, filling, diversion, and urban development. Construction of the causeway across the Little Rapids degraded the habitat and damaged the health of the native fish community. This project is the culmination of over two decades of work by state and local partners to address a legacy of pollution in the St. Marys River, including removing contaminated sediments, stopping combined sewer overflows, reducing nonpoint source pollution, and controlling invasive species like sea lamprey.

Planning for this project was initiated over twenty years ago with input from local stakeholders guiding restoration efforts. Key stakeholders included the St. Marys River Binational Public Advisory Council, Soo Area Sportsmen's Club, Michigan Department of Natural Resources, Michigan Department of Environmental Quality, Chippewa Ottawa Resource Authority, and Chippewa County Road Commission. In 2011, the Eastern U.P. Regional Planning & Development Commission received Great Lakes Restoration Initiative (GLRI) funding for preliminary modeling and engineering studies and an environmental assessment of the site. Additional site investigations were conducted in 2014 and 2015. Following approval of the final engineering and design construction was completed in 5.5 months. Bridge construction was completed in 2016 with ecological monitoring completed in 2018. The new bridge restored natural water flow to 70 acres of habitat creating foraging, spawning, and nursery habitat for a wide variety of sport fish, such as whitefish and salmon, as well as other aquatic organisms that need fast flowing water over a rocky substrate to complete their life cycle.

The project was managed locally by the Chippewa County Road Commission, which owns and is responsible for maintaining the bridge, and the Eastern Upper Peninsula Regional Planning and Development Commission. Lake Superior State University conducted monitoring of the river before, during and after project construction.

Before causeway construction *After causeway construction*

Cascade Valley View River Restoration

Akron, OH

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

ENTITY RECEIVING FUNDING: Summit Metroparks

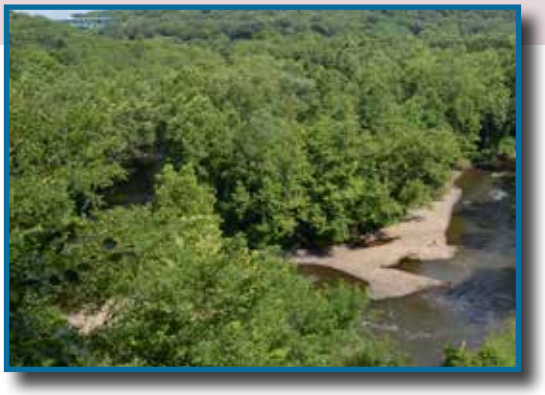
BUDGET: $3,725,743 from NOAA/GLC Regional Partnership

START/END DATE: August 2018 - August 2022

Located in northeast Ohio, the Cuyahoga River AOC is comprised of the lower 46.5 miles of the Cuyahoga River, including all the tributaries that drain to that section of river, and the adjacent Lake Erie shoreline and its tributaries. The AOC begins at the head of the Gorge Dam pool in Akron/Cuyahoga Falls, ends at Lake Erie, and includes the shoreline from the western Cleveland border to Euclid Creek on the east. The Cuyahoga River has a history of heavy industrial use and unmanaged pollution. Periodic pollution fires have plagued the river beginning in 1936, with the largest river fire occurring in 1952. By the 1960s, the lower Cuyahoga River in Cleveland was used for waste disposal and was choked with debris, oils, sludge, industrial wastes, and sewage. These toxins were considered a major source of pollution to Lake Erie, which was considered "dead" at the time. On June 22, 1969, the Cuyahoga River caught fire and captured national attention. This incident led to important environmental legislation including the Clean Water Act. It also spurred the creation of federal and state environmental protection agencies.

Summit Metro Parks (Metroparks) is in the process of restoring a recently acquired 200-acre golf course (Valley View Golf Club) along a two-thirds mile stretch of the Cuyahoga River at Cascade Valley View Metropark in Akron, Ohio. Initial restoration activities at the site have been implemented and funded by a Clean Ohio grant. This includes the restoration of headwater tributaries via daylighting of culverted streams, wetlands restoration, and reforestation of upland areas. In 2013, $525,743 was awarded to fund the engineering and design of this restoration plan through a 2016 NOAA/GLC Regional Partnership. An additional award of $3,200,000 was funded in 2019 under a new NOAA/GLC Regional Partnership to fund the implementation phase to restore an estimated 5,000 linear feet of the mainstem of the Cuyahoga River and 60 acres of associated floodplain. The restoration monitoring plan will also be completed during this phase of the project and build on active Metropark monitoring activities. The engineering and design is underway and includes the following components:

- Broaden bankfull from about 80 feet wide to about 140 feet wide;
- Widen meander curves to approximately a 200-foot radius;
- Reduce bankfull slopes to less than 3:1;
- Armor the outside banks and bridge footers with rootwads and coarse aggregate using natural stream design techniques; and
- Plant bankfull slopes heavily with native riparian species at 220 plants per acre and an aggressive native seed mix.



Brandenburg Park Shoreline Restoration

Chesterfield Twp., MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA), Great Lakes Restoration Initiative (GLRI), National Oceanic and Atmospheric Administration (NOAA), and Great Lakes Commission (GLC) St. Clair-Detroit River System Coastal Restoration Initiative

ENTITY RECEIVING FUNDING: Chesterfield Township

BUDGET: $$887,591 grant with $209,874 match provided by Chesterfield Township

START/END DATE: October 2018 - September 2021

Since 1976, Brandenburg Park has been the recreational crown jewel of Chesterfield Township. Located off Jefferson Avenue a quarter-mile south of 23 Mile Road, this 17-acre parcel is positioned along the shore of Anchor Bay and serves the recreational needs of the township and the greater Lake St. Clair area with a unique assortment of facilities.

Owned and maintained by Chesterfield Township, the park sees a steady stream of visitors and features four open-air pavilions, a splash pad, and a multipurpose building. The park's 500ft pier is one of only a few in Metro Detroit from which individuals can fish and view wildlife. Located five miles from I-94, this park's public boat launch attracts boating and fishing enthusiasts from all over the county and throughout the region. Erosion has led the original seawall to crumble and breakaway resulting in portions of the land being unsafe for park users, increased sediment flow into the lake, and reduced access for fishing. The primary goal of this project is to improve fish habitat at the park while eliminating a shoreline safety hazard and improving coastal recreation, especially fishing. Strong local government and community support will help sustain the proposed restoration activities and support healthy populations of native fish species into the future.

Engineering and design is underway for restoration of 740 linear feet of hardened shoreline and 1.5 acres of nearshore habitat at the park. The design will focus on a rocky breakwater to reduce wave energy and promote growth and establishment of wild celery (Vallisneria americana), which serves as important spawning, nursery, and foraging habitat for a variety of game fishes and a food source for waterfowl. Tree rootballs anchored to the breakwater and rock piles will also create habitat for a variety of herpetofauna. The park is permanently protected and will be maintained into the future by the Township.

Fish species found in Anchor Bay that will benefit from restoration include: smallmouth bass, Great Lakes muskellunge, northern pike, perch, lake sturgeon, and walleye. Historically, spawning, migration, feeding, and nursery habitat was plentiful along the coast of Lake St. Clair. However, urban development and armoring along the shore, including Brandenburg park, has significantly reduced available habitat for these, and other, fish species. Returning the shoreline to a more natural state will benefit these fish populations at the site and throughout the overall SCDRS.

Current conditions

Current conditions

Lake Erie Metropark Restoration

Brownstown Charter Twp., MI

FUNDING SOURCE: U. S. Environmental Protection Agency (USEPA), Great Lakes Restoration Initiative (GLRI), National Oceanic and Atmospheric Administration (NOAA) and Great Lakes Commission (GLC) St. Clair-Detroit River System Coastal Restoration Initiative

ENTITY RECEIVING FUNDING: Huron-Clinton Metropolitan Authority (HCMA)

BUDGET: $1,499,608 grant with $135,194 in matching funds provided by HCMA

START/END DATE: October 2018 - September 2021

This project will restore 1,183 linear feet of shoreline habitat and enhance 1.7 acres of Lake Erie coastal marsh at the Lake Erie Metropark by removing hardened shoreline structures and creating a network of shallow pools and channels within the Metropark.

Coastal wetlands were once extensive at this site, but shoreline armoring and erosion have severely degraded both their extent and quality. This project will restore and naturalize shoreline by removing rip-rap, establishing vegetation to improve aquatic habitat, and creating low-velocity areas protected from direct wave action adjacent to the restored shoreline. Fish spawning and nursery habitat will be created by developing shallow pools and channels within the park's existing coastal marshes. Historic site conditions will be emulated to address the loss of coastal wetland and shoreline habitat at multiple locations using an ecosystem-based approach with design and vegetation representative of native habitats but also constructed with an eye on anticipated future climate and lake level conditions. These projects will create functional habitats for native fish species use for migration, reproduction, growth, and seasonal refuge by improving a degraded coastal marsh and Lake Erie shoreline. Lake Erie Metropark is permanently protected as an important lake access point and amenity for multiple nearby communities.

HMCA staff are providing professional education and outreach to community members across the region and beyond. In association with this project, and with input from NOAA and GLC, HCMA will initiate and implement a communication and outreach plan to promote the restoration work and develop education and outreach opportunities (including signage) for the public, primarily based out of the Lake Erie Marshlands Museum. In addition, funds will be used to support six Summer Discovery Cruises in partnership with Michigan Sea Grant (http://www.miseagrant.umich.edu/sdc/) that will cast off from Lake Erie Metropark.

Conditions before restoration

Conditions before restoration

AMERICAN PUBLIC WORKS ASSOCIATION

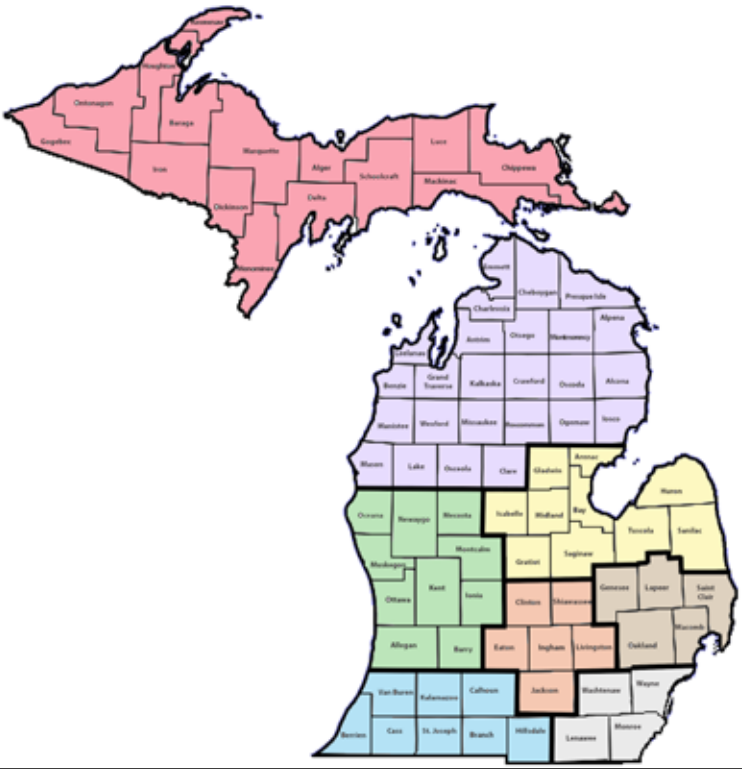
APWA Michigan Chapter

The American Public Works Association (APWA) Michigan Chapter serves professionals in all aspects of public works – a fact that sets it apart from other organizations and makes it an effective voice of public works throughout Michigan. With a membership of over 650 strong, APWA-MI includes not only personnel from local, county and state agencies, but also private sector personnel who supply products and services to those professionals. Our volunteer driven chapter is active and involved all year long. We are proud of our acclaimed professional and technical education programs, such as Michigan Public Service Institute, our Annual Conference, and our technical workshop series. Our Chapter and Branches also host "Snowplow Roadeos," Equipment Shows, and local networking events.

Membership in APWA is open to any individual, agency, or corporation with an interest in public works and infrastructure issues. Titles common to the membership include public works directors; city engineers; city managers; fleet managers; property and equipment superintendents; utilities managers; community development directors; transportation managers; park directors; county officials; and representatives from engineering and other consulting firms, manufacturers, construction companies, and a multitude of other service providers.

As a comprehensive public works resource, APWA continues in its rich tradition of making a difference both on an individual and professional level. APWA is a not-for-profit, 501(c)(3) organization that prides itself on its ability to provide varied educational and networking opportunities that help public works personnel to grow in their professionalism and directly impact the quality of life in all the communities they serve.

Get involved with Public Works professionals around the state - Join APWA Michigan Chapter!



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