



**St. Clair -
Detroit River
System
Initiative**

St. Clair – Detroit River System Initiative

Briefing Updates

2020-2021



2020-2021 Briefing Update Titles

2020

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Restrictions on Fish Consumption BUI update (Canadian Detroit River AOC)

Peche Island Fish Habitat and Erosion Mitigation Project

Tree Swallow studies

Fish Tumour and Other Deformities BUI Update (Canadian Detroit River AOC)

Colonial Waterbird studies

Collavino wetland



2020 Briefing Update

Agency

Friends of the St. Clair River (Friends)
St. Clair River Binational Public Advisory Council (SCR BPAC)

Contact

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Title

Blue Water River Walk

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase river spawning habitat; Increase hydrological lateral connectivity between main channel habitats (e.g., islands) and shallow water habitat; Adaptively manage invasive plants (e.g., Phragmites, European frogbit) at a system landscape scale

Update

The Blue Water River Walk, located in Port Huron along the shoreline of the upper St. Clair River, was officially opened on June 7th, 2014. The River Walk is almost 1 mile of restored shoreline and shallow water habitat. The River Walk is owned by the Community Foundation of St. Clair County which has established a River Walk Endowment for management and maintenance. The Friends of the St. Clair River (Friends) have a contract with the Community Foundation to provide maintenance of the shoreline habitat. A volunteer stewardship group, under the direction of Friends, provides weekly maintenance of the shoreline vegetation by removal of invasive species and trash. This program has been very effective in controlling invasives and the native vegetation is thriving. In the past year approximately 3100 volunteer stewardship hours have been dedicated to the monitoring and managing of native and invasive plant species, leading tours for school field trips, hosting booths at public events, conducting habitat field days and citizen scientist monitoring for butterflies, mussels, birds and macroinvertebrates. Current maintenance issues include control of invasives, such as Japanese Knotweed and Phragmites by spraying which is contracted out. Removal of a building has opened more area for native planting which will be done in 2020 at a cost of approximately \$50,000.

Structurally, the high water conditions in the Great Lakes has resulted in the outer rock reef structures being submerged resulting in significantly increased erosion around shoreline structures and beaches. The Endowment Fund invested \$ 80,000 in 2019 to stabilize the existing shoreline and fill in eroded

areas. This year work is just getting underway to add 250 tons of new stone to further stabilize the shoreline at a cost of \$50,000. Monitoring of fish in the shallow water habitat areas is conducted by the U.S.G.S. In 2018 the U.S.G.S. reported finding 35 different species at the River Walk site, more species than were found at any of the other restored habitat sites on the St. Clair River.

www.bluewaterriverwalk.org; www.scriver.org



School Field Trip at the Blue Water River Walk.



Volunteers at the Blue Water River Walk.



Volunteers working at the Blue Water River Walk.



2020 Briefing Update

Agency

U.S. Fish and Wildlife Service; Michigan Department of Environment, Great Lakes, and Energy
FWS Michigan Field Office Ecological Services; EGLE Water Resources Division

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Title

Bald Eagle Productivity Assessments

SCDRS Initiative Objective(s)

Complete remedial actions to remove bird or animal deformities or other reproductive problems BUI

Update

The U.S. Fish and Wildlife Service with support from state partners in the Michigan Department of Environment Great Lakes and Energy (EGLE) Area of Concern (AOC) programs and Water Resources Division have been conducting bald eagle productivity assessments in several AOCs throughout Michigan including the River Raisin, Detroit River, and St. Clair River AOCs since 2015. This project builds on decades of productivity surveys previously funded by the Michigan Department of Natural Resources and 2015-2019 contaminants evaluations conducted by EGLE. Monitored AOCs have been heavily contaminated, largely with PCBs, leading to reduced bald eagle reproduction and health, resulting in populations that are not self-sustaining. These effects on bald eagles have contributed to the designation of a Bird or Animal Deformities or Reproductive Problems BUI at these AOCs. Even though this BUI has been removed within the St. Clair River AOC, eagle nest surveys continue in the St. Clair River corridor, providing information about the transfer of aquatic contaminants to terrestrial food webs. This study is designed to assess if remedial action goals have been met and BUI removal is warranted.

Annually, airplane flights are conducted to detect new eagle nests as well as successful reproduction (chicks), and blood is collected from chicks for analysis of contaminants, namely PCBs and DDE (a DDT metabolite). Based on 2014-2018 data, an average of 1.7 and 1.3 bald eagle chicks are produced per nest in the River Raisin and Detroit River AOCs, respectively. This exceeds the 1.0 chick per nest level of reproduction needed to maintain a healthy population and even exceeds the statewide average (1.1 chicks per nest; excluding AOCs with the Bird or Animal Deformities or Reproductive Problems BUI).

More eagles are nesting and more chicks are raised in the AOCs than ever before, suggesting Great Lakes Restoration Initiative (GLRI) cleanup and habitat restorations have benefited eagle populations. However, contaminants in chicks as well as eagle prey fish (examined as part of a separate monitoring effort) suggest contaminant levels within these AOCs remain elevated to a level potentially harmful to the health and future reproductive ability of these bald eagles. In the River Raisin and Detroit River AOCs eagle chick blood had PCB concentrations of 84 $\mu\text{g}/\text{kg}$ and 40 $\mu\text{g}/\text{kg}$, respectively, exceeding the 35 $\mu\text{g}/\text{kg}$ level associated with a healthy and self-sustaining populations. To assess if AOC eagles are contributing to the eagle population, a genetics project beginning later this year will use new and archived blood samples to examine the relatedness of eagles throughout Michigan. This information will be used to clarify the reproductive fate of AOC reared eagles and provide insight into if AOCs are population sources, suggesting bald eagle recovery with healthy, self-sustaining populations or unsustainable population sinks.

This study contributes to a broader strategy supported by FWS and State of Michigan Water Resource Division and AOC Program to use multiple lines of evidence (e.g., herring gull, bald eagle, forage fish) of wildlife health and reproduction to evaluate BUIs. As such, this study should be considered a companion study to the herring gull breeding assessment conducted within the SCDRS and supported by federal and state partners.



Bald eagle chicks in a nest. (Credit: USFWS)



2020 Briefing Update

Agency

U.S. Fish and Wildlife Service and Calvin University
FWS Ecological Services Michigan Field Office

Contact

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Title

Assessment of Population, Reproductive, and Health Impairments in Herring Gulls Breeding in the River Raisin Area of Concern in Western Lake Erie

SCDRS Initiative Objective(s)

Complete remedial actions to remove bird or animal deformities or other reproductive problems BUI

Update

Beginning in 2010, Dr. Keith Grasman at Calvin University, with support from the U.S. Fish and Wildlife Service and the Great Lakes Restoration Initiative (GLRI), began on-going monitoring of herring gull health and reproduction at the Detroit Edison Monroe Power Plant on the western shore of Lake Erie in the River Raisin Area of Concern (AOC). This monitoring is part of a larger, AOC-focused colonial nesting bird project including other colonies in contaminated areas in the Saginaw Bay and Grand Traverse Bay. This effort assesses the effects of contaminants, primarily polychlorinated biphenyls (PCBs) and polychlorinated dibenzodioxins (PCDDs), in herring gulls. Results are used to assess two wildlife-related beneficial use impairments (BUIs) at this AOC: 1) bird or animal deformities or reproductive problems and 2) degraded fish and wildlife populations.

At the Monroe Power Plant, immune and reproductive impairments in herring gulls consistent with the effects of persistent pollutants such as PCBs and PCDDs have continued despite remediation dredging in 2014 and 2016 to remove PCB-contaminated sediments from the lower River Raisin. Moreover, results from Monroe are similar to those in herring gull colonies in other Michigan locations with similar contamination. During the past decade, a number of embryos and chicks were observed with deformities such as crossed bills and gastroschisis (development of intestines outside of the abdominal wall) at Monroe, and embryonic nonviability, which decreases hatch rates, was elevated relative to a reference site in the St. Marys River. Chicks that survived to hatching had low growth rates in 5 out of 10 years. Additionally, reproduction, measured by the number of chicks per nest surviving to four weeks, was poor in 7 of 10 years, including 4 of the last 5 years and complete reproductive failure in 3 of 10

years. Measures of immune response (T-cell mediated immune and antibody responses) were suppressed to approximately half of that in gulls at the reference site. Suppression of these immune responses has been associated with reduced survival in wild birds and may help explain the significant declines of breeding herring gulls at the Monroe Power Plant colony over the past three decades. Time trend analyses showed no significant improvements in reproductive and immune endpoints over the 10 year course of the study.

This study will continue to collect data needed to assess the above wildlife BUIs for the River Raisin AOC as well as the more northern Saginaw River and Bay AOC. Additionally, information from this monitoring effort is used in a collaboration with the Canadian Wildlife Service; the Michigan Department of Environment, Great Lakes, and Energy; and the University of Maryland to address the ecological impacts of contaminants across the Great Lakes using herring gulls as a sentinel species. This study contributes to a broader strategy supported by FWS and State of Michigan Water Resource Division and AOC Program to use multiple lines of evidence (e.g., herring gull, bald eagle, forage fish) of wildlife health and reproduction to evaluate BUIs. As such, this study should be considered a companion study to the bald eagle productivity assessments conducted within the SCDRS and supported by federal and state partners.



A herring gull chick with a crossbill deformity found at the DTE Power Plant, Monroe, MI within the River Raisin AOC in 2013. Credit Calvin University



Dr. Keith Grasman's students collect blood collection from a herring gull chick for immunological testing, 2019. Credit USFWS



Dr. Keith Grasman and his students process herring gull chicks for immunological responses and growth, 2019. Credit USFWS



2020 Briefing Update

Agency

U.S. Geological Survey
Upper Midwest Water Science Center

Contact

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Title

USGS Monitoring Activities on the Tributaries and Connecting Channels of the Great Lakes

SCDRS Initiative Objective(s)

Reduce loading from regulated and unregulated sources of TP/DRP; Identify contaminants of concern (e.g. pharmaceuticals and personal care products, microplastics) determine sources, and develop load reduction strategies; Reduce loadings from legacy contaminant sources (including groundwater at known locations in DR)

Update

The U.S. Geological Survey (USGS), Upper Midwest Water Science Center continues to measure stream flows and nutrient concentrations in tributaries to Lake St Clair and Lake Erie through work with the International Joint Commission, USEPA Great Lakes Restoration Initiative, state and local partners, and USGS support. We have operated two gages in the connecting channels of the Great Lakes including sites at the St Clair River at Port Huron, MI (USGS Site 04159130) and on the Detroit River at Fort Wayne at Detroit, MI (04165710) since 2008. The Detroit River site now includes a Web camera used to determine if there are any issues (ice, debris, freighters, etc.) that may influence collection of reliable stream velocity data. Not long after the camera was installed, there was a break wall collapse just upstream within its' field of view.

Over the past year, we started sampling on the Detroit River just downstream of the confluence of the Rouge River (Detroit R. at River Rouge, MI; USGS site 04168557) for nutrients, sediment, and chloride in cooperation with the US EPA Great Lakes Restoration Initiative. Equal-width increment samples are taken bi-monthly for a total of 24 samples a year. Our objectives are to provide improved data for estimating loads entering Lake Erie.

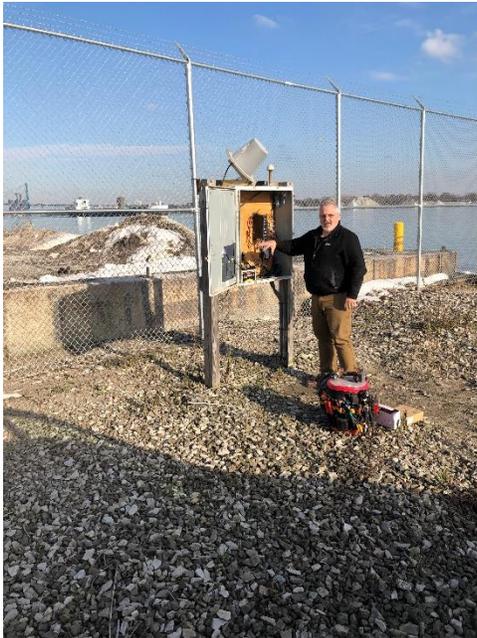
Future plans in discussion phase include developing "next generation" approaches to monitoring flows and water quality to improve accuracy and provide continuous streamflow and nutrient loads.

Additionally, USGS is in discussion with the Great Lakes Water Authority, the USEPA Great Lakes Restoration Initiative, and others to improve our monitoring networks on the Clinton River, Rouge River, and tributaries to Saginaw Bay.

<https://www.usgs.gov/centers/umid-water>

https://waterdata.usgs.gov/nwis/uv?site_no=04165710

https://waterdata.usgs.gov/nwis/uv?site_no=04159130



USGS Hydrologist Dave Owens standing next to the USGS stream gage on the Detroit River at Fort Wayne at Detroit, MI (04165710). This gage records velocity of the Detroit River through an acoustic Doppler velocity meter installed on the stream bank. (Photo credits Alex Totten and Josh Loewel, U.S. Geological Survey)



Close-up view of the newly installed web camera looking upstream at the USGS stream gage on the Detroit River at Fort Wayne at Detroit, MI (04165710). Images are obtained hourly and are available here:

https://waterdata.usgs.gov/nwis/uv?site_no=04165710.

(Photo credits Alex Totten and Josh Loewel, U.S. Geological Survey)



2020 Briefing Update

Agency

U.S. Fish and Wildlife Service
Sea Lamprey Control Program

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Title

Sea Lamprey Assessment of the St. Clair- Detroit River System During 2019 and Survey Plans for 2020

SCDRS Initiative Objective(s)

Apply integrated pest management for sea lampreys in the SCDRS

Update

Background: U.S. Fish and Wildlife Service (FWS) and Fisheries and Oceans, Canada, (DFO) work as agents of the Great Lakes Fishery Commission (GLFC) to deliver integrated control of sea lampreys throughout the Great Lakes. Adult sea lamprey (SL) abundance in Lake Erie decreased in 2019. The 2019 index of adult SL abundance was 1,587, which is significantly less than the record-high level from 2010, and below the Lake Erie target level of 3,263. During 2019, six SL-producing streams were treated in Lake Erie, all of which were in the U.S.

The SCDRS is known to harbor a larval SL population within the confines of the St. Clair River (SCR) as well as in the delta of Lake St. Clair. Previous assessment of this population suggested that density was low, infestation widespread, SL production likely minimal, and that SL mortality during migration through the SCDRS would result in a minimal contribution of parasitic SL to the Lake Erie basin. Because assessment information from other tributaries to Lake Erie could not identify an untreated source of SL production, the control agents intensified assessment effort on the SCDRS during 2011-2014. Following extensive larval survey effort in 2014, the larval SL population of the St Clair River was estimated to be 919,509. From 2015-2019, a baseline effort of larval surveys was applied along with alternative sampling for outmigrating juvenile SL. Survey findings continue to indicate a significant larval SL population persists throughout the SCR. Although potential sea lamprey control scenarios in the SCR have been solicited by sea lamprey program managers, there are currently no plans to implement large scale treatment effort within the river.

2019 results: During the 2019 field season, 18 granular Bayluscide (GB) surveys covering 13,000 m² were



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Agency

Friends of the Detroit River

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Title

Celeron Island Habitat Restoration

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase riparian complexity/connectivity through increased softened shorelines and native riparian veg.; Increase continuous area of functional wetlands and their connectivity to the SCDRS; Increase river spawning habitat; Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribes; Increase hydrological lateral connectivity between main channel habitats (e.g., islands) and shallow water habitat

Update

Celeron Island lies south of Grosse Ile near the mouth of the Detroit River. It is owned by the State of Michigan and is under the jurisdiction of the MDNR's Pointe Mouille State Game Area. The island's near shore areas have remnants of emergent and submergent aquatic plants, which are important spawning, nursery and refuge areas for sport, commercial and forage fish species. It is also situated within a major flyway and is therefore an important resting spot for migratory birds and waterfowl. This project is one of 14 projects targeted by the Detroit River Public Advisory Council (PAC) that require completion to remove fish and wildlife related beneficial use impairments as part of the process to delist the Detroit River as an Area of Concern.

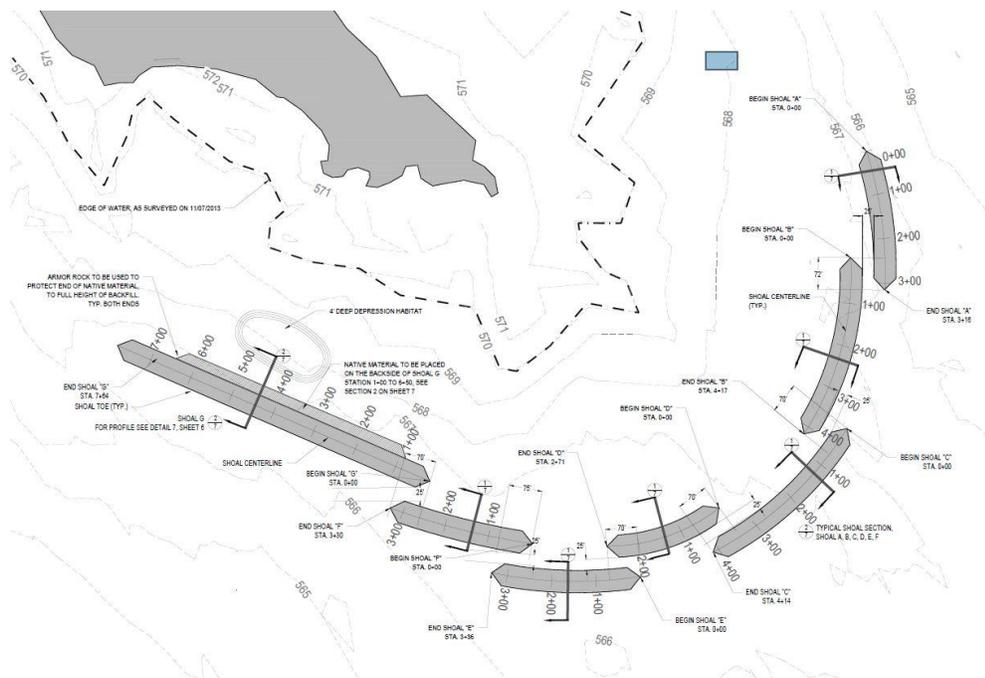
The loss of protective shoreline has led to the degradation of much of the complex wetland associations that lined the outer shoreline and the inner bay at the center of the island and a reduction in the once abundant beds of submergent aquatic vegetation. The purpose of this project was to construct a series of emergent and offshore shoals to prevent erosion of the isle's southern end and northeast side and to reform previously lost wetland areas by reducing river currents and wave action. These structures will protect the island from strong south and southeast lake driven waves and will allow for the regeneration of wetlands in the quiet water formed behind the shoals.

A GLRI grant to conduct feasibility and design for both Celeron and Stony Islands was awarded to Friends of the Detroit River (FDR) from NOAA in September 2013. Environmental Technology & Consulting, Inc. (ECT) was engaged to carry out the work, which established practical limits of wetland and submergent habitat that could be restored within the degraded and eroded areas adjacent to the Islands. Preliminary engineering was completed in July 2014 followed by joint permitting with EGLE and USACE – permit issuance in June 2015.

NOAA continued funding the Celeron Island project with a grant to FDR for the project’s implementation. E.C. Korneffel Co. was selected, following competitive bidding, to construct the work. Habitat restoration improvements included the creation of over 4,000 LF of shoal to protect the north bay and nearly 2,900 LF of shoal “islands” wrapping the isle’s south end – one of the shoal islands, measuring over 800 feet long, was planted with native materials on its inner side. An area of shoreline habitat was constructed along one of the south bay shoals offering amenities for turtles and mudpuppies. A snake hibernaculum was constructed where the north shoal meets the island.

Construction was completed by December 2019 with post-construction monitoring anticipated for summer and fall 2020. The project was essentially constructed as planned but included many minor changes to cope with unforeseen conditions including rising water levels and instability of existing dredge material.

<https://detroitriver.org/>



Celeron Island – South Island Shoals Layout Plan. Image Credit: Environmental Consulting & Technology, Inc.



10-9-19 – Aerial View of Island Shoals at South End of Celeron Island Photo. Credit: American Aggregates, LLC



10-9-19 – Aerial View of Shoal Protecting Celeron Island's North Bay. Photo Credit: American Aggregates, LLC



2020 Briefing Update

Agency

Friends of the Detroit River

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Title

Lake Okonoka Restoration with River Connection and Shoreline Restoration

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase riparian complexity/connectivity through increased softened shorelines and native riparian veg.; Increase continuous area of functional wetlands and their connectivity to the SCDRS; Increase river spawning habitat; Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribes; Increase hydrological lateral connectivity between main channel habitats (e.g., islands) and shallow water habitat

Update

Lake Okonoka is on Belle Isle – at the “gateway” to the Detroit River. This project is one of 14 projects targeted by the Detroit River Public Advisory Council (PAC) that require completion to remove fish and wildlife related beneficial use impairments as part of the process to delist the Detroit River as an Area of Concern. The project makes advancements in reconnecting Belle Isle’s internal waterways to the river and restoring the isle’s wet-mesic flatwoods forest to enhance habitat for a great diversity of animal and plant species. It includes: 1.) A hydrologic assessment and pre-design of Belle Isle’s interconnected lakes, canals and 200-acre wet-mesic flatwoods forest, which could lead to habitat restoration of 286 acres for fish and wildlife within a dense urban area; 2.) Design and engineering for improving the hydrologic function of Lake Okonoka by enhancing its connectivity to the Blue Heron Lagoon and Detroit River, coupled with habitat enhancements along Belle Isle’s south shore; 2.) Implementation of Item 2.

NOAA awarded a GLRI grant to Friends of the Detroit River (FDR) to begin this project in 2014. The hydrology/pre-design work was completed in 2015. In 2015 FDR also received funding from NOAA to complete final engineering for bridge and culvert structures for Lake Okonoka’s connections to Blue Heron Lagoon and Detroit River. Wade Trim completed engineering work along with permit and bidding documents. SmithGroup published a final report documenting the analysis work and conceptual recommendations for restoration strategies in October of 2016. Design and engineering for improving

Lake Okonoka's hydrologic connectivity to the Blue Heron Lagoon, along with making a new connection from the lake to the Detroit river and habitat enhancements along the isle's south shore was completed by SmithGroup in June of 2016. Joint permits were received by EGLE and the USACE in September of 2017.

In September 2017, following competitive bidding, Z Contractors, Inc. was selected to implement the restoration project. The lake was drained in October, followed by channel and deep pool excavations along with habitat structure placement over the following winter. A permit from MDOT to construct the bridge was issued in January of 2019, and its construction commenced immediately. Concrete work continued through the winter into May followed by the asphalt approaches in September.

Unfortunately, water levels in the entire Great Lakes Basin rose to near record highs at the same time the opening between Lake Okonoka and Blue Heron Lagoon was made. Torrential, mid-April rains caused water in Lake Okonoka to over-top its banks, flooding the flatwoods forest, Woodside Drive, and most of The Strand. The flood conditions persisted throughout the summer, stopping work on all remaining elements of the project – removal and restoration of Woodside Drive, finishing the wet meadow between the lake and flatwoods forest, installing the 10'-square box culvert where fish passage between the lake and river is planned, and all associated lawn restoration.

High water and frequent rain events delayed the culvert installation until the winter of 2020. With high water persisting, the project team worked during the spring of 2020 to develop temporary measures to control water from entering Lake Okonoka, allowing the lake water to be pumped down enough to construct the remaining project elements. A water-filled, rubber bladder will serve as a temporary cofferdam at the 50' wide bridged opening, and the box culvert will be equipped with a removable, stop log panel. Construction of the remaining project elements will follow, with anticipated completion by summer of 2020. Assuming water levels will recede to within the "normal" range sometime this year, the DNR will remove the temporary water control measures.

<https://detroitriver.org/>



5-08-18 – Northern Water Snakes and turtles retake the lake in the spring of 2018. Photo Credit: SmithGroup



11-13-18 – Coyote and Bald Eagle watch over the project site. Photo Credit: SmithGroup



02-11-20 – The 10'-square box culvert is being installed under the Strand between Lake Okonoka and the Detroit River. Photo Credit: Friends of the Detroit River



2020 Briefing Update

Agency

Friends of the Detroit River

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Title

Stony Island Habitat Restoration

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase riparian complexity/connectivity through increased softened shorelines and native riparian veg.; Increase continuous area of functional wetlands and their connectivity to the SCDRS; Increase river spawning habitat; Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribbs; Increase hydrological lateral connectivity between main channel habitats (e.g., islands) and shallow water habitat

Update

Stony Island is an uninhabited 52-acre island in the lower Detroit River. The purpose of its restoration was to restore historic shoals and create additional shoals that will protect the Island from further erosion and provide backwater area while restoring coastal wetland habitat. The implementation of this project is the first step in completing a major habitat re-construction among the islands in the lower part of the Detroit River. The Island's wetlands are owned by the State of Michigan and are under the jurisdiction of the MDNR's Pointe Mouille State Game Area. The island's two major coastal wetland areas, known locally as the upper and lower bays, historically have been protected by two limestone dikes, which provided protection from the river's currents and wave surges. The dikes that protect the coastal wetlands have disappeared under the effects of decades of erosion and the wetland areas have degraded.

This project is one of 14 projects targeted by the Detroit River Public Advisory Council (PAC) that require completion to remove fish and wildlife related beneficial use impairments as part of the process to delist the Detroit River as an Area of Concern. Being a targeted project in the Detroit River AOC delisting guidance plan, its completion made a significant advancement toward the Detroit River Public Advisory Council's primary goal of removing fish and wildlife related beneficial use impairments. Other goals that were achieved included: 1) re-establishment of spawning and nursery habitat for commercial, sport and

forage fish species; 2) revitalization of coastal wetlands; and 3) protection/establishment of native bird habitat, reptile and amphibian habitat, and of terrestrial resources within the watershed.

A GLRI grant to conduct feasibility and design for both Stony and Celeron Islands was awarded to Friends of the Detroit River (FDR) from NOAA in September 2013. Environmental Technology & Consulting, Inc. (ECT) was engaged to carry out the work, which established practical limits of wetland and submergent habitat that could be restored within the degraded and eroded areas adjacent to the Islands. Preliminary design and engineering were completed in July 2014 followed by joint permitting with EGLE and USACE – permit issuance in June 2015.

NOAA continued funding the Stony Island project with a grant to FDR for the project's implementation. E.C. Korneffel Co. was selected, following competitive bidding, to construct the work. Habitat restoration improvements included the creation of 550 LF of habitat shoal "islands" in the upper bay, with 250 LF topped with turn habitat, and nearly 3,500 LF of habitat shoals in the south bay. An area of shoreline habitat was constructed along one of the south bay shoals offering amenities for turtles and mudpuppies. A fish nursery area was created on the inside of the south habitat shoal by excavating a v-shaped area approximately 30' wide by 200' long to a water depth of about 10'. The excavated material was used to construct a submergent shoal near the depression to block current around the depression. In the depression a 1-foot stone/gravel base was added to provide voids for small fish fry to seek protection from predation, along with some larger stones that will provide hiding and conjugation areas for larger fish. The top of the submergent shoal was constructed from between 1.5 to 2.5 feet below the water's surface. Upland habitats (snake hibernacula, turtle nesting areas and other structural habitats) were completed on the island shore.

Construction and post-construction monitoring were completed by December 2018. The project was essentially constructed as planned but included many minor changes to cope with unforeseen conditions including rising water levels, instability of existing dredge material and the closure of the rock delivery route over the Grosse Ile Bridge during the second year of construction.

<https://detroitriver.org/>

Construction Activities at Stony Island



Stony Island – Presentation Poster. Image Credit: Environmental Consulting & Technology, Inc.



10-18-18 – Aerial View of Island Shoals with Tern Habitat at Stony Island’s North Bay. Photo Credit: American Aggregates, LLC



10-09-19 – Habitat island shoal at Stony Island’s south end has fully vegetated. Photo Credit: Environmental Consulting & Technology, Inc.



2020 Briefing Update

Agency

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Friends of the Detroit River

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Title

Sugar Island Habitat Restoration

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase riparian complexity/connectivity through increased softened shorelines and native riparian veg.; Increase continuous area of functional wetlands and their connectivity to the SCDRS; Increase river spawning habitat; Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs; Increase hydrological lateral connectivity between main channel habitats (e.g., islands) and shallow water habitat

Update

Sugar Island is an uninhabited, 28-acre island located near the mouth of the Detroit River, southeast of Grosse Isle. Once the site of an amusement park in the early 20th Century, it is now part of the U.S. Fish and Wildlife Service's Detroit River International Wildlife Refuge (DRIWR). This general area of the Detroit River serves as one of the most important spawning areas for western Lake Erie; however, fish populations surrounding Sugar Island are relatively low.

This project is one of 14 projects targeted by the Detroit River Public Advisory Council (PAC) that require completion to remove fish and wildlife related beneficial use impairments as part of the process to delist the Detroit River as an Area of Concern. The Fish & Wildlife BUI Report proposes the following project goal: stop further erosion on the southern end of the island and enhance fish and wildlife habitat along the south shore and nearshore area. The vision of the current project is to develop an ecological restoration design solution that is sustainable, responds to the needs of the Detroit River ecosystem, and aligns with the mission of the DRIWR.

A GLRI grant to conduct feasibility and design for Sugar Island was awarded to Friends of the Detroit River (FDR) from NOAA in June 2017. SmithGroup was engaged to carry out the work, which established

practical limits of wetland and submergent habitat that could be restored around the southern end of the island and a strategy to stabilize the isle’s eroding south shore. Following extensive data collection including sediment characterization; bird, fish and herpetofauna monitoring; topographic survey and bathymetry work; and development of wind, wave and river current modeling, two conceptual plans were developed for stakeholder input. The project team chose to incorporate features from both alternatives into a final concept. The plan was vetted to the public in November 2018 and received tremendous support. To complete this phase of the project, SmithGroup published a final report featuring the results of information gathering and hydrodynamic modeling along with the final concept plan and an opinion of construction costs.

NOAA continued funding the Sugar Island project with a grant to FDR to further develop the plan along with additional hydrodynamic modeling to verify feasibility of any changes, complete final engineering, permitting and construction documents. SmithGroup is assisting FDR, PAC, USFWS and other project stakeholders with this work, with the intent of bidding the project in the fall of 2020. The initial concept plan was updated based on additional hydrodynamic modeling, additional data is being collected, and permit documents are under development.

Links

<https://www.fws.gov/>

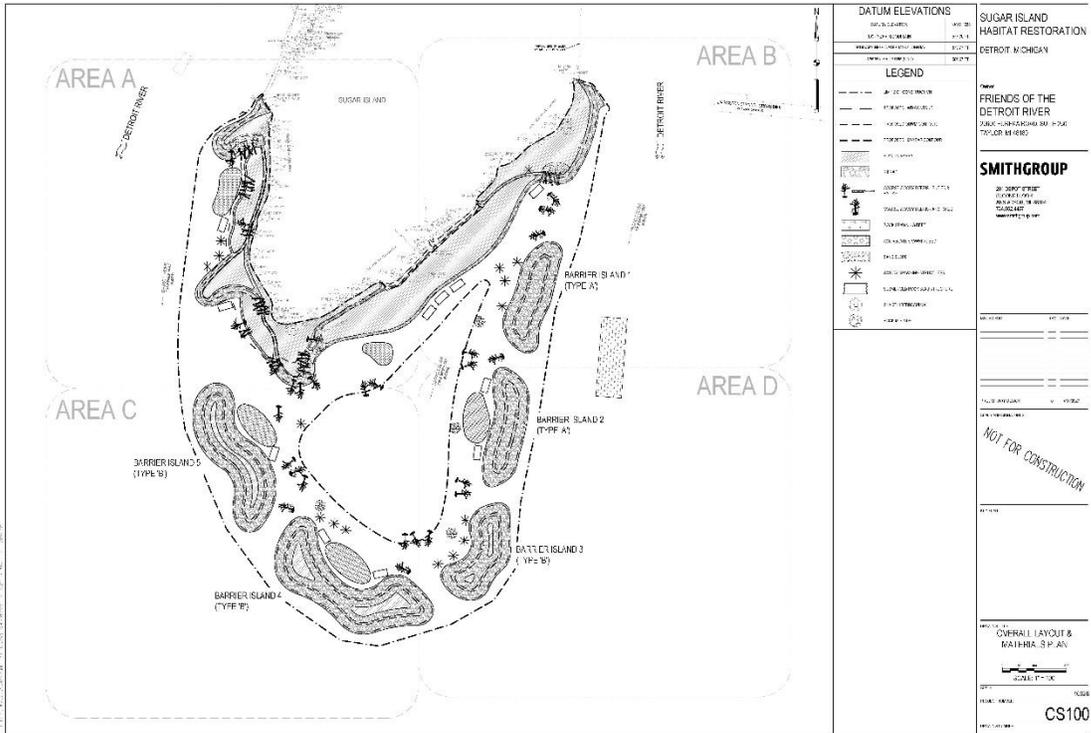
<https://detroitriver.org/>



Sugar Island’s south shore is an eroding cliff face. Image Credit: Friends of the Detroit River



Aerial View of Sugar Island's South Shore eroding into the Detroit River and Lake Erie. Image Credit: Friends of the Detroit River



Preliminary Layout for Barrier Island Shoals, South Shore Erosion Control, Spawning Beds and Habitat Structures at South end of Sugar Island. Image Credit: SmithGroup



2020 Briefing Update

Agency

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Title

Egg deposition in the St. Clair – Detroit River System

SCDRS Initiative Objective(s)

Evaluate habitat improvement projects to remove loss of fish and wildlife habitat BUI, assess SCDRS Initiative Indicator #17: Area of suitable habitat for lithophilic spawners (Increase river spawning habitat)

Update

Objectives: Assess and measure the community composition, phenology, and spatial extent of egg deposition by lithophilic broadcast spawning fishes in the Detroit (DR) and St. Clair (SCR) rivers.

Milestones: Intensive longitudinal studies of fish egg deposition using eggmats on natural habitat have been occurring in the DR since 2007 and in the SCR since 2010. Multiple habitat types were sampled in each river including main channels, channel fringes, shallow island margins, rivermouths, and open lake areas. In addition, spawning reefs were constructed in the DR at Belle Isle (2004 and expanded 2016), Fighting Island (2008 and expanded in 2013), Grassy Island (2015), Fort Wayne (2018) and in the SCR at Middle Channel (2012), Hart's Light (2014), and Pointe aux Chenes (2014). Studies of egg deposition occurred at the reef sites, and at control sites upstream and downstream, during both pre- and post-construction years. Spring egg collection and rearing focused on walleye, suckers, and lake sturgeon, while fall collection and rearing has focused on lake whitefish.

Results Overview, 2018 & 2019

Spring

The full length of the DR was sampled in the spring; however, the majority of our effort was centered around spawning restoration reef sites listed above. Eggmats were placed at reef areas for post-assessment. Pre-assessment sites included a shoreline restoration site upstream of Belle Isle (UDSR, 2018 only). Walleye eggs were collected at all sites in both years. Sucker eggs were collected in low densities throughout the river, except for Fighting Island, where sucker eggs were collected at higher densities. Lake sturgeon eggs were collected for the first time at the newly constructed Fort Wayne reef

(2019), and again at Fighting Island (2018 & 2019). Lake sturgeon eggs were not collected from the Belle Isle nor Grassy Island reefs in either 2018 or 2019.

Sampling in the SCR focused on post-assessment at Middle Channel, Hart's Light, and Pointe aux Chenes restoration reefs, and at Mazlinka's reef (the historic sturgeon spawning site in the North Channel at Algonac). Lake sturgeon eggs were collected from Hart's Light, Pointe aux Chenes, and Mazlinka's reefs in both years; no lake sturgeon eggs were collected from the Middle Channel reefs.

Fall

Fall sampling for fish eggs in the DR were in the same geographic areas as spring for both 2018 and 2019. Only lake whitefish eggs were collected and they were collected from all areas; densities were greater on the natural substrates of the control sites than on the corresponding reef artificial substrates.

Sampling for fish eggs in the SCR was also conducted at the same sites as spring for both 2018 and 2019. No fish eggs were collected in 2018; several lake whitefish eggs were collected from Pointe aux Chene and Hart's Light in 2019.

2020 Plans: Spring and summer field sampling was suspended due to the coronavirus pandemic.



2020 Briefing Update

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Title

Larval fish studies in the St. Clair-Detroit River System

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI, Increase river spawning habitat, Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs

Update

Objectives: Assess and measure the community composition, phenology, species abundances, spatial extent, movement, and production of larval fishes in and transported through the system.

Milestones: During 2018, 584 bongo net samples were collected from the Detroit River (DR), 1016 from Lake St. Clair (LSC), 324 from the St. Clair River (SCR) and 200 from the Michigan waters of Lake Erie (LKE). During sampling for Lake Erie CSMI in 2019, 719 bongo net samples were collected from the DR, 1062 from LSC, 361 from the SCR and 360 from the Michigan waters of LKE. To sample lake sturgeon larval drift on the Fort Wayne constructed reef in the DR, 42 D-frame and 167 stratified conical sets were fished. In the SCR, 168 stratified conical nets were fished.

Results Overview: Results below are based on the samples completed, not all larval identifications have not been completed at the time of this update. In 2018, an estimated 96,0077 larval fish were collected in bongo samples in the SCDRS, and to date identified species include lake whitefish, walleye, yellow perch, *Morone* spp. (white bass/white perch), suckers, and several native forage fish species, among others. In 2019, an estimated 79,871 fish were collected in the bongo samples from the SCDRS and fish identified to date include similar species as in 2018. We collected 2,926 fish in the D-frame samples and 9,832 fish in the stratified conicals sets from DR and SCR. Species identified in the D-frame and stratified conical samples to date include lake sturgeon collected below the Fort Wayne Reef, mottled sculpin, coregonids, yellow perch, catostomids, percids, rainbow smelt, and gobids.

2020 Plans: Spring and summer larval field sampling was suspended due to coronavirus pandemic. Larval fish sample processing will continue for samples collected in 2018 and 2019.



2020 Briefing Update

Agency

Michigan Department of Natural Resources
Lake St. Clair Fisheries Research Station

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Assessment Program Summary for 2019 – Lake St. Clair Fisheries Research Station (LSCFRS)

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase river spawning habitat; Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs

Update

The following assessment activity scheduled for 2019 was completed:

1. Lake St. Clair fish community trap net survey – This survey consists of small mesh trap nets fished from late April through mid-May at 4 sites in Anchor Bay, Lake St. Clair. The principal species typically captured include smallmouth bass, rock bass, channel catfish, northern pike, muskellunge, white bass, white perch, yellow perch, freshwater drum, and various species of suckers.
2. Lake St. Clair fish community trawl survey – This survey includes 10m headrope bottom trawling in Anchor Bay, Lake St. Clair during late May and early September. Total effort ranges from 6 to 16 trawl tows per year. This gear is most efficient at capturing small fish and provides an index of abundance for many of the forage species. The September trawls also provide an index of year-class strength for yellow perch and smallmouth bass as age 0 fish each year. Catch rates for spottail shiner, historically an important forage fish species in Lake St. Clair, have been low in recent years.
3. St. Clair River sturgeon setline survey – The sturgeon setline survey has been conducted annually since 1997, except for 2003. This survey is conducted each year beginning in late May and continuing for 3 or 4 weeks. The survey gear includes 8 setlines (each with 25 hooks) baited with round gobies. Annual effort typically ranges from 80 to 100 overnight sets. Two hook sizes have been used to sample a broader size range of lake sturgeon. This survey is the principal source of mark-recapture data used in

estimating the abundance of lake sturgeon in the St. Clair River. Minnow traps baited with earthworms continued to be productive for documenting presence of northern madtom when fished on the setlines in 2019.

4. Lake Erie fish community trawl survey – This was the 6th year of a relatively new survey that includes 10m headrope bottom trawling at 8 sites in the Michigan waters of Western Lake Erie during early to mid-August. This gear is most efficient at capturing small fish and provides an index of abundance for many forage species as well as age 0 yellow perch and walleye.

5. Lake Erie walleye fall gill net survey – This survey consists of 1300' experimental multifilament gill nets fished overnight at 2 index locations twice during early October in Michigan waters of Lake Erie. The gill net gangs are canned on 6' strings to sample the upper portion of the water column. Walleye are generally the dominant species in the catch, but gizzard shad, white perch, and white bass, are also caught in substantial numbers. This survey provides an annual index of abundance by year-class for walleye in the Michigan waters of Lake Erie and is also used in estimating walleye abundance for interagency quota allocation purposes.

6. Reef sonar surveys – This work consists of side-scan and single-beam sonar surveys at artificial reefs constructed in the SCDRS to annually document reef conditions. Side scan surveys were completed at the Fort Wayne, Grassy Island, and Fighting Island reef sites in 2019.

7. Cormorant nest survey – LSCFRS staff have conducted visual counts of cormorant nests by boat on Lake St. Clair on an intermittent basis beginning in 2004. Nests have been documented on the navigational structures along the shipping channel near the head of the Detroit River and on Grassy Island in the St. Clair River delta. In 2019, 6 navigation structures and Grassy Island combined for a total of 227 nests, up 14 nests from the 2018 survey total, but down 20 from the high of 247 nests observed in 2016.

8. Lake St. Clair nearshore electrofishing survey – This relatively new survey (initiated in 2016) samples 13 nearshore index locations that represents the available nearshore habitat of Lake St. Clair. This survey represents additional monitoring for non-native species in Lake St. Clair and provides insight into important sportfish species and the forage community that supports them.

https://www.michigan.gov/documents/dnr/LSCFRSStatus2019_688145_7.pdf



2021 Briefing Update

Agency

Detroit River Public Advisory Council (The PAC) and Friends of the Detroit River (FDR)

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Priority Projects for Restoring Beneficial Use Impairments and Delisting the Detroit River Area of Concern

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase continuous area of functional wetlands and their connectivity to the SCDRS; Increase river spawning habitat

Update

Celeron Island: Celeron Island is part of the Detroit River Conservation Crescent near the southern end of Grosse Ile. The Celeron Island habitat restoration project was bid out in the fall of 2018, construction began in the spring of 2019 and was completed in 2020. The project has added nearly 4,000 linear feet of shoals with a sand bar for nesting turtles, snake hibernacula, and common tern nesting areas. The shoals also protect over 100 acres of coastal wetlands with additional spawning habitat to encourage a robust fish population.

Lake Okonoka: This project began in October 2017 and was completed in 2021 when the culvert connection from the lake to the Detroit River was made. Multiple habitat elements, such as a wet meadow, deep channels on the lake bottom, mudflats and protective shoals along the isle's south shore provide specialized areas to support a variety of species. This project includes restoration of 45 acres of aquatic and upland habitat. Lake Okonoka's enhancements combined with the 2013 opening of Blue Heron Lagoon (another 41 acres) to the Detroit River will increase the availability of calm spawning and nursery habitat for Great Lakes fish.

Hennepin Marsh: Located on the Grosse Ile near the toll bridge, Hennepin Marsh is approximately 62 acres of very sensitive coastal wetland, providing habitat for fish, shorebirds, waterfowl, turtles, and amphibians. Feasibility and design began in 2019 and is expected to be completed soon. Construction will begin when funding is secured.

Sugar Island: Sugar Island is an uninhabited 30-acre island owned by the U.S. Fish and Wildlife Service as part of the Detroit River International Wildlife Refuge located in the southern end of the Detroit River. The downstream end of Sugar Island is exposed to Lake Erie where it is buffeted by high wave and wind action, which has caused severe erosion (as much as 10% of the island in recent decades). The project partners completed a feasibility study in the fall of 2018 and identified a preferred option calling for stabilizing and restoring 1,900 linear feet of coastal shoreline and creating 20 acres of marsh and submergent habitat to benefit both aquatic and terrestrial species. The PAC and FDR are currently working with U.S. FWS, consultants and other partners on the permitting process. Construction will begin when funding is secured.

Sediment: After completing several sediment sampling efforts in 2016 and 2017, the EPA found it necessary to do additional sampling in the Harbor Town area of the Detroit River. EPA completed its additional sediment sampling work in late 2018. The PAC and FDR are now partnering with the U.S. EPA to map hotspots in the river to identify area for future sediment remediation efforts.

Other Projects: The PAC and FDR also continue to provide input on a variety of other habitat and sediment remediation projects that are not under our direct supervision. These include the Upper Detroit Riverfront Parks, Belle Isle Flatwoods, Upper Trenton Channel Sediment Cleanup, Monguagon Creek Upper Trenton Channel Sediment Project and McLouth Community Advisory Group.

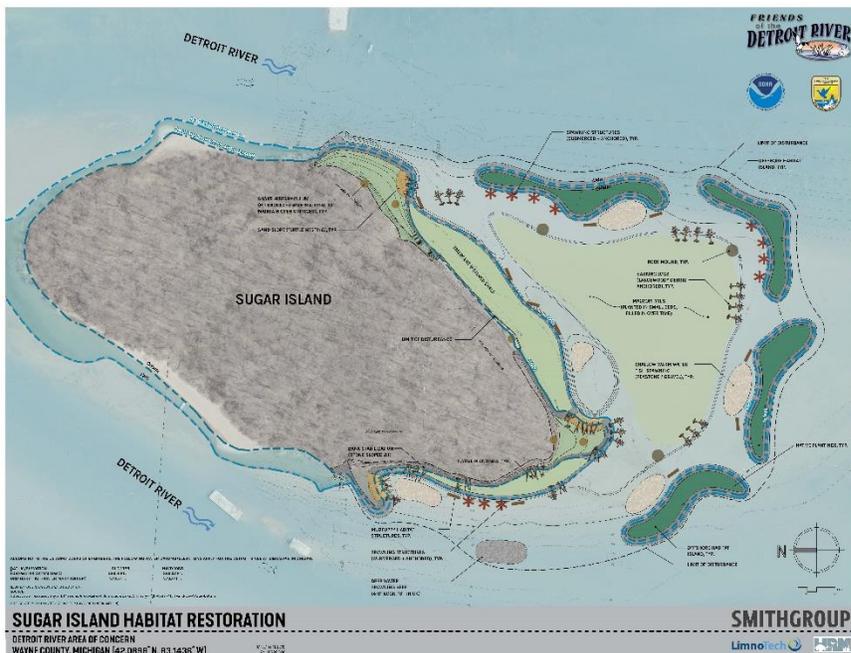
<https://detroitriver.org/pac.html>

<https://detroitriver.org/projects-detroit-river-environmental-restoration-projects.html>

<https://detroitriver.org/story-map.html>



Celeron Island Habitat restoration shoals provide protection to the island from Lake Erie wave action, erosion and create a calm area for the growth of aquatic vegetation that provides additional fish and wildlife habitat.



Conceptual design plan for the Sugar Island restoration project that is expected to begin construction by the summer of 2021.



2021 Briefing Update

Agency

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Title

Adult Fish Community Assessments in the St. Clair - Detroit River System

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase river spawning habitat

Update

The U.S. Fish and Wildlife Service annually deploys gill nets to monitor the adult fish community within the St. Clair-Detroit River System. Experimental gill nets (3.0 - 6.0" mesh) are fished bi-weekly in the spring and fall at random locations in the St. Clair and Detroit rivers. Minnow traps are also attached to the gill nets in an effort to monitor the small benthic fish community.



2021 Briefing Update

Agency

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Title

Spatial ecology of juvenile lake sturgeon (*Acipenser fulvescens*) in the Detroit River

SCDRS Initiative Objective(s)

Increase river spawning habitat Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs

Update

To aid in Lake Sturgeon recovery efforts in large river systems, we propose to use acoustic telemetry to describe movements and habitat use of juvenile Lake Sturgeon in the Detroit River and western Lake Erie and to explore hypotheses about the effects of season and body size on juvenile dispersal and site fidelity. We test the hypothesis that juveniles will show fidelity to core areas and do not undergo seasonal or ontogenetic shifts in habitat use. Results are expected to aid managers when determining the level of habitat connectivity necessary to promote Lake Sturgeon recruitment. Information on juvenile movements produced from this study also is necessary to measure juvenile abundance, which has been identified as a key metric to evaluate the status of Lake Sturgeon in the Detroit River.



2021 Briefing Update

Agency

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Maumee River Lake Sturgeon Restoration Program

SCDRS Initiative Objective(s)

Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribes

Update

Lake sturgeon recruitment in the Lake Erie basin is currently supported by two connecting channels, the St. Clair – Detroit River System and Niagara River. Historically, there were 16 other spawning populations in Lake Erie. In an effort to delist this endangered species in the State of Ohio and throughout the Lake Erie basin, efforts are underway to rehabilitate lake sturgeon populations in suitable river systems. The Maumee River, located in western Lake Erie, historically supported large runs of lake sturgeon, but currently are considered functionally extirpated from this system. A habitat suitability model for spawning adult and age-0 lake sturgeon indicates sufficient habitat is present in the Maumee River. Therefore, the river is a strong candidate for a lake sturgeon reintroduction. A lake sturgeon restoration plan has been approved by the Ohio Department of Natural Resources and Great Lakes Fishery Commission Lake Erie Committee. Lake sturgeon will be reared by the Toledo Zoo and Genoa National Fish Hatchery. To date, 5,865 Lake Sturgeon have been stocked into the Maumee River, with many being recaptured in the western basin of Lake Erie.

<https://www.toledozoo.org/conservation>



2021 Briefing Update

Agency

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Title

Lake Sturgeon Setline Assessments

SCDRS Initiative Objective(s)

Increase river spawning habitat; Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs

Update

The U.S. Fish and Wildlife Service has been conducting setline assessments in the Detroit River and upper St. Clair River annually since 2006 to obtain information on adult and subadult lake sturgeon. This data is used to obtain growth information, genetics, distribution, potential spawning sites, and population demographic information.



2021 Briefing Update

Agency

Fisheries and Oceans Canada
Great Lakes Laboratory for Fisheries and Aquatic Sciences

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SCDRS Dissolved Oxygen and Temperature Logger Program

SCDRS Initiative Objective(s)

Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs

Update

The objective of this study was to extend the spatial coverage of water temperature and dissolved oxygen (DOT) monitoring in the St. Clair-Detroit River System (SCDRS), with a focus on shallow, protected embayments and/or connecting tributaries. This report describes approximately seven years (collected from 2007-2018) of seasonal data collected in the St. Clair River and Detroit River Areas of Concern (AOCs) and describes trends within the river over time between reaches of the river and exposed and sheltered sites. In both AOCs, water temperature fluctuated seasonally, with temperatures rising from April to early July, peaking in mid-July to August and declining from September to December, as expected. MannKendall tests on both the St. Clair River and Detroit River summer temperatures showed no significant trend of increasing or decreasing temperature over the years at sites that had sufficient data for trend analysis. For both AOCs, water temperatures appeared relatively similar between upstream to downstream sites within a given year. Both AOCs showed seasonal trends in which DO increased from September to February/March and decreased from April to August. Generally, DO levels were within set exceedance levels throughout the sampling periods in both AOCs to support a healthy fish community. Overall, the SCDRS showed consistent seasonal trends in both water temperature and DO throughout the AOCs in shallow areas. However, to assess long-term changes, continued monitoring and comparison with dyked and main channel temperatures is advised. Summarizing and describing these data will assist in accurately quantifying thermal habitat availability and help better determine if delisting targets are being met in the SCDRS AOCs by modifying physical habitat supplies based on local temperature conditions.

Currently in 2021, we continue to log temperature in the SCDRS, data will be made available on open data portals.

<https://waves-vagues.dfo-mpo.gc.ca/Library/40882378.pdf>



2021 Briefing Update

Agency

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Title

Detroit River Area of Concern Status Report: Assessment of Fish Habitat

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs; Increase hydrological lateral connectivity between main channel habitats (e.g., islands) and shallow water habitat

Update

We used the Habitat Ecosystem Assessment Tool (HEAT) to determine the status of Beneficial Use Impairment 14 (fish and wildlife habitat) by analyzing Canadian pre- and post- in-water projects in the Detroit River Area of Concern (AOC). Changes in fish habitat from projects were evaluated using HEAT and contextualized for reporting on delisting goals. As well, habitat suitability was calculated for the whole AOC to use as a baseline assessment of overall habitat supply and to identify important areas for different fish guilds and their life stages. These data were also overlaid with ecotype classifications to provide estimates of the amount of ecotypes available (e.g. wetland, river mouth, main channel) exist. This project is only in its preliminary stages but the final report will include broad recommendations for habitat restorations that target select fish guilds and their life stages.



2021 Briefing Update

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Title

Fish habitat geodatabase and gap analysis for the St. Clair - Detroit River System (SCDRS)

SCDRS Initiative Objective(s)

Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs

Update

In this assessment, the St. Clair-Detroit River System spans from the source of the St. Clair River at Lake Huron through Lake St. Clair and south to the outflow of the Detroit River at Lake Erie. This restricted SCDRS extent is bordered by one American state (Michigan) and one Canadian province (Ontario) and does not include the western basin of Lake Erie. The SCDRS historically had extensive fish and wildlife habitat, however, increased urbanization and pollutants, among other factors, have degraded the system, resulting in the listing of four Great Lakes Areas of Concern within the SCDRS. Extensive temporal and spatial datasets have been collected by several agencies on both sides of the border. Fisheries and Oceans Canada has compiled, organized, and analyzed these datasets into geospatial layers in a geodatabase to generate maps of ecologically important features: lake floor and land elevation, flow/velocity, toxicity, vegetation, and substrate type. This report outlines how the data were collected, stored, and summarized into a geodatabase. Data gaps for each layer have been identified. This report has reconciled the data collected and merged the different classification schemes into one spatial layer for each ecological feature assessed and identified methods that could be applied for any future work. We recommend standardized data collection and classification for the different data layers in the system moving forward. Generally, we recommend consistent, frequent, spatially-representative sampling of features that change often or seasonally, such as vegetation, and less frequent updates for spatial layers such as elevation but there are certain areas with very old or inaccurate information that should be targeted.



2021 Briefing Update

Agency

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Peche Island Restoration Monitoring

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI

Update

As part of a shoreline protection project for Peche Island (Windsor ON), Fisheries and Oceans Canada (DFO) has provided projected impacts and benefits to fish habitat for the project using the Habitat Ecosystem Assessment Tool (HEAT). Preliminary results showed an overall gain for nearshore fish species in newly created low-flow areas of a new embayment on Peche Island. In addition, DFO will provide post monitoring project support by sampling habitat and the fish community in 2021 and 2023. Sampling has not been completed yet so there are currently no results or drafts of reports to share, with the exception of the projected outcomes from HEAT scenarios.



2021 Briefing Update

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Title

St. Clair River Area of Concern Status Report: Assessment of Fish Habitat

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs; Increase hydrological lateral connectivity between main channel habitats (e.g., islands) and shallow water habitat

Update

We used the Habitat Ecosystem Assessment Tool (HEAT) to determine the status of Beneficial Use Impairment 14 (fish and wildlife habitat) by analyzing Canadian pre- and post- in-water projects in the St. Clair River Area of Concern (AOC). Changes in fish habitat from projects were evaluated using HEAT and contextualized for reporting on delisting goals. As well, habitat suitability was calculated for the whole AOC to use as a baseline assessment of overall habitat supply and to identify important areas for different fish guilds and their life stages. These data were also overlaid with ecotype classifications to provide estimates of the amount of ecotypes available (e.g. wetland, river mouth, delta area, and main channel habitats). This report is in draft but will include broad recommendations for habitat restorations that target select fish guilds and their life stages.



2021 Briefing Update

Agency

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Assessment of fish and fish habitat in the St. Clair River delta, 2015

SCDRS Initiative Objective(s)

Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs

Update

The St. Clair River delta (hereinafter the 'Delta') is known for its extensive biodiversity. The fish habitat and community assessment presented in this report was completed in partnership with Walpole Island First Nation in an effort to provide better regional data on fish habitat and fish communities. Given the extensive complexity of these coastal wetland habitats and high biodiversity that occurs in the area, the Delta was identified as a priority for fish habitat and fish community surveys. The objectives of the 2015 fish habitat sampling efforts were to conduct surveys on: submerged aquatic vegetation, substrate, water quality, fish communities, and water depths / lakebed elevations in select locations of the Delta in order to characterize the habitat and fish community of the area. With few exceptions, established metrics for vegetation, water quality, and fish community all indicated that the Delta was no different than similar reference sites and that fish communities and fish habitat were generally in good condition. A diverse fish community was characterized using two gear types within the Delta, with 53 fish species captured in midsummer, four of which were species at risk. Derived fish IBI scores (index of biological integrity, ref which one) based on electrofishing were generally greater than those calculated for more impaired Areas of Concern (AOCs — Hamilton Harbour and Toronto and Region), and comparable to IBI scores reported in the Bay of Quinte AOC, with unimpaired fish communities. We recommend the Delta be used as a reference to assess the presence or absence of impairment of nearshore fish communities with other areas in the SCDRS.



2021 Briefing Update

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Sediment Contamination in the Huron-Erie Corridor

SCDRS Initiative Objective(s)

Remove contaminated sediments to remove degradation of benthos BUI; Complete remedial actions to remove restrictions on fish and wildlife consumption BUI; Complete remedial actions to remove fish tumors and other deformities BUI

Update

A corridor-wide sediment sampling campaign was completed in 2013-2014 for analysis of legacy contaminants and polybrominated diphenyl ethers and compared against corridor wide monitoring completed in 2004. Analytical results of the spatial survey were published in: Drouillard, KG, J Lafontaine, A Grgicak-Mannion, K McPhedran, E Szalinska. 2020. Spatial and temporal trends of metal and organic contaminants in the Huron-Erie Corridor: 1999-2014. In. Crossman, J and C Weisener (Eds.), Contaminants of the Great Lakes, The Handbook of Environmental Chemistry, vol 30., pp 49-83, Springer, Berlin; and Drouillard, KG, Y Qian, *J Lafontaine, N Ismail, K McPhedran, E Szalinska, A Grgicak-Mannion. 2019. Polybrominated diphenyl ethers (PBDEs) in sediments of the Huron-Erie corridor. Bull. Environ. Contam. Toxicol. 102:450-456. The data have been used to evaluate several beneficial use impairments in the Detroit River including degraded benthos, fish tumours and fish consumption advisories. We are now in the initial stages of planning for a new corridor-wide survey to be implemented in 2024-2025 that will apply a stratified random sampling design of approximately 300 sampling stations (100 St. Clair River; 100 Lake St. Clair and 100 Detroit River) to continue the decadal assessment of improvement in sediment chemistry parameters within the corridor initiated since the early 2000's. Included components in the sampling campaign may include benthic invertebrate assemblages and other sampling as identified by prospective partners, including MECP, ECCC and Walpole Island Heritage Center and others.



2021 Briefing Update

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Flow monitoring and nutrient monitoring

SCDRS Initiative Objective(s)

Reduce loading from regulated and unregulated sources of TP/DRP; Reduce loadings from legacy contaminant sources (including groundwater at known locations in DR); Integrated landscape contaminant source assessment

Update

We continue to measure flows on Great Lakes tributaries and the connecting channels throughout the basin. Additionally, there are a significant number of water-quality sample locations throughout the region that report nutrient concentrations and loads to the Great Lakes.

<https://waterdata.usgs.gov/nwis>



2021 Briefing Update

Agency

University of Windsor, Great Lakes Institute for Environmental Research

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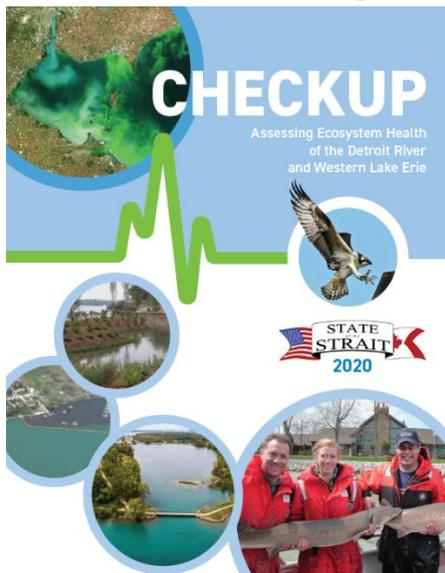
Checkpoint: Assessing Ecosystem Health of the Detroit River and Western Lake Erie

SCDRS Initiative Objective(s)

Remove contaminated sediments to remove degradation of benthos BUI; Complete remedial actions to remove restrictions on fish and wildlife consumption BUI; Complete remedial actions to remove bird or animal deformities or other reproductive problems BUI; Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Reduce loading from regulated and unregulated sources of TP/DRP; Reduce biological contamination (e. coli, pathogens, virus impacts on wildlife); Increase continuous area of functional wetlands and their connectivity to the SCDRS; Increase river spawning habitat; Adaptively manage invasive plants (e.g., Phragmites, European frogbit) at a system landscape scale

Update

Please see stateofthestrain.org for the full report.





2021 Briefing Update

Agency

U.S. Fish and Wildlife Service
Sea Lamprey Control Program

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Title

Sea Lamprey Assessment of the St. Clair- Detroit River System During 2020 and Survey Plans for 2021

SCDRS Initiative Objective(s)

Apply integrated pest management for sea lampreys in the SCDRS

Update

Background: U.S. Fish and Wildlife Service (FWS) and Fisheries and Oceans, Canada, (DFO) work as agents of the Great Lakes Fishery Commission (GLFC) to deliver integrated control of sea lampreys throughout the Great Lakes. Adult sea lamprey (SL) abundance in Lake Erie decreased slightly in 2020 and remains at target and holding steady. It should be noted, however, that due to the pandemic only two adult index streams could be surveyed using mark-recapture in Lake Erie in 2020. Additionally, no lampricide treatments of infested Lake Erie streams occurred during 2020.

The SCDRS is known to harbor a larval SL population within the confines of the St. Clair River (SCR) as well as in the delta of Lake St. Clair. Previous assessment of this population suggested that density was low, infestation widespread, SL production likely minimal, and that SL mortality during migration through the SCDRS would result in a minimal contribution of parasitic SL to the Lake Erie basin. Because assessment information from other tributaries to Lake Erie could not identify an untreated source of SL production, the control agents intensified assessment effort on the SCDRS during 2011-2014. Following extensive larval survey effort in 2014, the larval SL population of the St Clair River was estimated to be 919,509. From 2015-2019, a baseline effort of larval surveys was applied along with alternative sampling for outmigrating juvenile SL. Survey findings continue to indicate a significant larval SL population persists throughout the SCR. Although potential SL control scenarios in the SCR have been solicited by program managers, there are currently no plans to implement large scale treatment effort within the river.

2020 survey results: No granular Bayluscide (GB) surveys were conducted in SCR. There were no surveys

conducted in the Detroit River during 2020. Based on previous surveys, the Detroit River continues to have no larval SL production.

Plans for 2021 and beyond: Sea Lamprey control agents from the DFO plan to survey 24 GB plots in the Upper SCR on the Canadian side of the river. No surveys are planned in the SCR on the U.S. side in 2021. The Detroit River will be surveyed with GB during 2021.

<http://www.glf.org/sea-lamprey.php>

<http://www.fws.gov/midwest/fisheries/sea-lamprey.html>

<http://www.dfo-mpo.gc.ca/species-especies/profiles-profilis/sealamprey-lamproiemarine-eng.html>



2021 Briefing Update

Agency

Ohio Lake Erie Commission

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H2Ohio

SCDRS Initiative Objective(s)

Reduce loading from regulated and unregulated sources of TP/DRP

Update

H2Ohio is Governor Mike DeWine's comprehensive, data-driven water quality plan to reduce harmful algal blooms, improve wastewater infrastructure, and prevent lead contamination

"We have a moral obligation to preserve and protect our natural resources," Governor DeWine said during a speech at the National Museum of the Great Lakes in Toledo. "My H2Ohio plan is a dedicated, holistic water quality strategy with long-lasting solutions to address the causes of Ohio's water problems, not just the symptoms."

Governor DeWine's H2Ohio plan is an investment in targeted solutions to help reduce phosphorus runoff and prevent algal blooms through increased implementation of agricultural best practices and the creation of wetlands; improve wastewater infrastructure; replace failing home septic systems; and prevent lead contamination in high-risk daycare centers and schools. The Ohio General Assembly invested \$172 million in the plan in July, and since then, H2Ohio experts have been developing strategies for long-term, cost-effective, and permanent water quality solutions.

<https://h2.ohio.gov/>



2021 Briefing Update

Agency

Fisheries and Oceans Canada
Great Lakes Laboratory for Fisheries and Aquatic Sciences

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Title

Application of a fish IBI to coastal wetlands in the St. Clair and Detroit River Areas of Concern

SCDRS Initiative Objective(s)

Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs; Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI

Update

Fish community data collected using boat electrofishing and fyke netting were used to calculate fish index of biotic integrity (IBI) scores for coastal areas and wetlands in the St. Clair River (SCR) and Detroit River (DR) Areas of Concern (AOC). For each system and gear type, IBI scores were compared with values derived at sites in the Walpole Island Delta (a regional reference area with comparatively low anthropogenic disturbance) to determine whether there was evidence of impairment within the AOC. Based on fyke net data, there were no significant differences in IBI score among wetlands in the SCR that had been restored (75.8 ± 5.7 [mean \pm standard deviation]) or not restored (69.5 ± 7.4) relative to wetlands in the Walpole Island Delta (73.3 ± 7.9). An important caveat to this comparison is that the application of the IBI to fyke net data has not been fully validated, therefore comparisons should only be made within gear-types and values should not be used outside of this study without validation. A lack of difference between sites within the SCR AOC and Walpole Island Delta suggests that, from a fish IBI perspective, wetland conditions in the SCR AOC do not indicate impairment under Beneficial Use Impairment (BUI) #14 (Loss of Fish and Wildlife Habitat). Confirmation of this status from surveys of other biotic communities (e.g., submerged aquatic vegetation, marsh birds, and invertebrates) is recommended prior to delisting. Sampling at sites in the DR was primarily intended to establish baseline conditions pre-restoration; however, based on boat electrofishing data, no differences were found between IBI scores at DR sites (68.3 ± 14.8) and comparable sites in the Walpole Island Delta (66.5 ± 11.5). In addition to IBI scores, fish community data are also presented herein with generally high species richness in both DR (49 species) and SCR (up to 37 species) and multiple species at risk in both systems. A more thorough investigation of these community data may contribute to the assessment to

BUI#3 (Degradation of Fish and Wildlife Populations) in the DR AOC and could also be used to validate fish habitat suitability models for both systems.

<https://waves-vagues.dfo-mpo.gc.ca/Library/40887340.pdf>



2021 Briefing Update

Agency

Fisheries and Oceans Canada
Great Lakes Laboratory for Fisheries and Aquatic Sciences

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Title

Development of a submerged aquatic vegetation model for the St. Clair and Detroit Rivers

SCDRS Initiative Objective(s)

Identify and protect critical habitat areas for rare species, including river mouth habitats & connectivity within tribs

Update

Submerged aquatic vegetation (SAV) is an important component in aquatic ecosystems, providing numerous ecosystem services including habitat for fishes throughout their life history. In the St. Clair and Detroit River Areas of Concern (AOC), accurate maps of the distribution and cover of SAV are important for assessing the distribution and condition of fish habitat within these AOCs. To support these efforts, this report details the development of random forest models for SAV presence and percent cover. The final SAV presence and percent cover models included all three available environmental parameters: depth, velocity, and effective fetch. A unique dataset indicated that the best SAV presence model had an overall accuracy of over 93% (Kappa >0.85) while the best SAV percent cover model explained the most variance (>75%) and had the lowest root mean square error (19.3). The resulting models are now available to be applied spatially within these AOCs and should prove useful in the assessment of the status of the fish and wildlife populations beneficial use impairment.

<https://waves-vagues.dfo-mpo.gc.ca/Library/40887285.pdf>



2021 Briefing Update

Agency

Michigan Department of Environment, Great Lakes, and Energy

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Michigan's Lake Erie Domestic Action Plan Highlights

SCDRS Initiative Objective(s)

Reduce loading from regulated and unregulated sources of TP/DRP

Update

Michigan's Domestic Action Plan

In 2018, to reduce the amount of phosphorus and nitrogen entering Lake Erie, Michigan released the Lake Erie Domestic Action Plan (DAP) developed by the DAP Team, which is a senior management working group from the Michigan Departments of Agriculture and Rural Development; Environment, Great Lakes, and Energy; and Natural Resources. Michigan's DAP set the road map for reducing phosphorus entering Lake Erie by 40 percent by 2025. The DAP Team was also charged with developing an Adaptive Management Plan as a companion document to the DAP.

Michigan's Adaptive Management Plan

The Michigan Lake Erie DAP called for the state to implement an "active" adaptive management approach at two levels: the Michigan-specific level and the binational Lake Erie basin level. Michigan is following the adaptive management framework as defined by the U.S. Department of the Interior. This involves "...exploring alternative ways to meet management objectives, predicting the outcomes of alternatives based on the current state of knowledge, implementing one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results to update knowledge and adjust management actions."

It is an approach intended to achieve objectives in systems that are responsive to management actions where there is uncertainty. It is useful in the management of natural systems because the detailed workings of such systems may not be fully known, but many policy and program alternatives exist.

Recent efforts are also underway to use an adaptive management approach to binationally reduce nutrient loads to Lake Erie and reduce algae blooms and hypoxia through the formation of a Great Lakes Water Quality Agreement, Annex 4 (Nutrients) Subcommittee's Adaptive Management Task Team, which has been charged with:

- * Determining uncertainties,
- * Defining the actions to take,
- * Implementing and then evaluating the results of those actions.

Each water year that passes offers an opportunity to learn more about system response and adjust actions if and where necessary.

https://www.michigan.gov/egle/0,9429,7-135-3313_3677_95226-507535--,00.html



2021 Briefing Update

Agency

Detroit River Canadian Cleanup; Environment and Climate Change Canada; Ontario Ministry of Environment, Conservation, and Parks

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Title

Degradation of Benthos BUI update (Canadian Detroit River AOC)

SCDRS Initiative Objective(s)

Remove contaminated sediments to remove degradation of benthos BUI

Update

Historically, pollution discharges from the heavily urbanized and industrialized shorelines of the Detroit River have contributed to the significant ecological degradation of the benthos community. Many benthos are a key source of food for fish, frogs, and other wildlife. Over the past two decades a series of intensive investigations into the sediment quality and benthos health of the Detroit River were conducted. Results of these studies showed that sediment contaminants declined steadily between 1999-2013 and that the vast majority of the Canadian side of the Detroit River showed minimal benthos impairment and potential for bioaccumulation. These results indicate that the benthos communities are now considered to have recovered to a point where they are no longer impaired in the Detroit River and official re-designation of this BUI to not impaired was completed in December 2020.

www.detroitriver.ca



2021 Briefing Update

Agency

Detroit River Canadian Cleanup; Environment and Climate Change Canada; Ontario Ministry of Environment, Conservation, and Parks; University of Windsor (GLIER)

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Title

Restrictions on Fish Consumption BUI update (Canadian Detroit River AOC)

SCDRS Initiative Objective(s)

Complete remedial actions to remove restrictions on fish and wildlife consumption BUI

Update

Researchers from the Great Lakes Institute for Environmental Research at the University of Windsor have been conducting several studies to identify whether consumption advisories for our indicator species (walleye, brown bullhead, and smallmouth bass for sensitive populations) are similar to other non-AOC Great Lakes sites. This analysis is ongoing and expected to be completed in March 2022.

To provide another line of evidence for the assessment of this beneficial use, the DRCC is implementing an angler fish consumption survey to collect data on what people catch and eat from the Detroit River. So far, majority of anglers (67%) captured in the survey eat the fish they catch from the river (4 to 8 oz of fish per meal about 1 to 4 times per month, on average). The majority of anglers (69%) prefer to pan fry the fish they catch and the most common fish consumed from the Detroit River according to the survey are walleye, yellow perch, smallmouth bass, and white perch.

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2021 Briefing Update

Agency

Detroit River Canadian Cleanup; City of Windsor; Essex Region Conservation Authority; Ontario Ministry of Natural Resources and Forestry; Swim, Drink, Fish; Environment and Climate Change Canada

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Title

Peche Island Fish Habitat and Erosion Mitigation Project

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI; Increase river spawning habitat

Update

Peche Island is a 79-acre island located in the upper Detroit River near Lake St. Clair. The island is owned by the City of Windsor and is a municipal park that is accessible only by boat. The island and surrounding waters have 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 multiple life stages. The marsh on the island has been deemed provincially significant and the entire island is designated as an environmentally sensitive area. Nearly a century of strong river currents and heavy wave action from Great Lakes freighter traffic has significantly eroded the island shoreline resulting in a loss of an estimated 17 acres of the island's area between 1931 to 2015.

The primary objective of the Peche Island Fish Habitat and Erosion Mitigation Project – Detroit River is to create a revetment on the northeast side and a series of off-shore sheltering islands on the north side of the island to protect from further erosion while providing fish refuge and the opportunity for the establishment of macrophytes. This project is being completed with the partnership of the City of Windsor, Essex Region Conservation Authority, the Detroit River Canadian Cleanup, Swim, Drink, Fish, Environment and Climate Change Canada (ECCC) and Ontario Ministry of Natural Resources and Forestry (OMNRF). Once completed this \$6.5 million project will include the construction of 9.25 offshore sheltering islands on the north side of Peche Island, a 607.9 m rock revetment on the northeast side of the Island and creation of approximately 10.5 ha of backwater habitat for fish.

Phase one of the project began in October 2020. Construction of 4 of the 9.25 sheltering islands which has created approximately 4 ha of backwater fish habitat was completed in December 2020 (Phase 1 on site map). Approximately 210 – 250 m of the 607 m of revetment on the northeast side of the island is scheduled to be completed in Winter or late Summer 2021, depending on weather conditions (Phase 1). The plans and timing for subsequent construction phases will be dependent on availability of additional funding in the coming years.

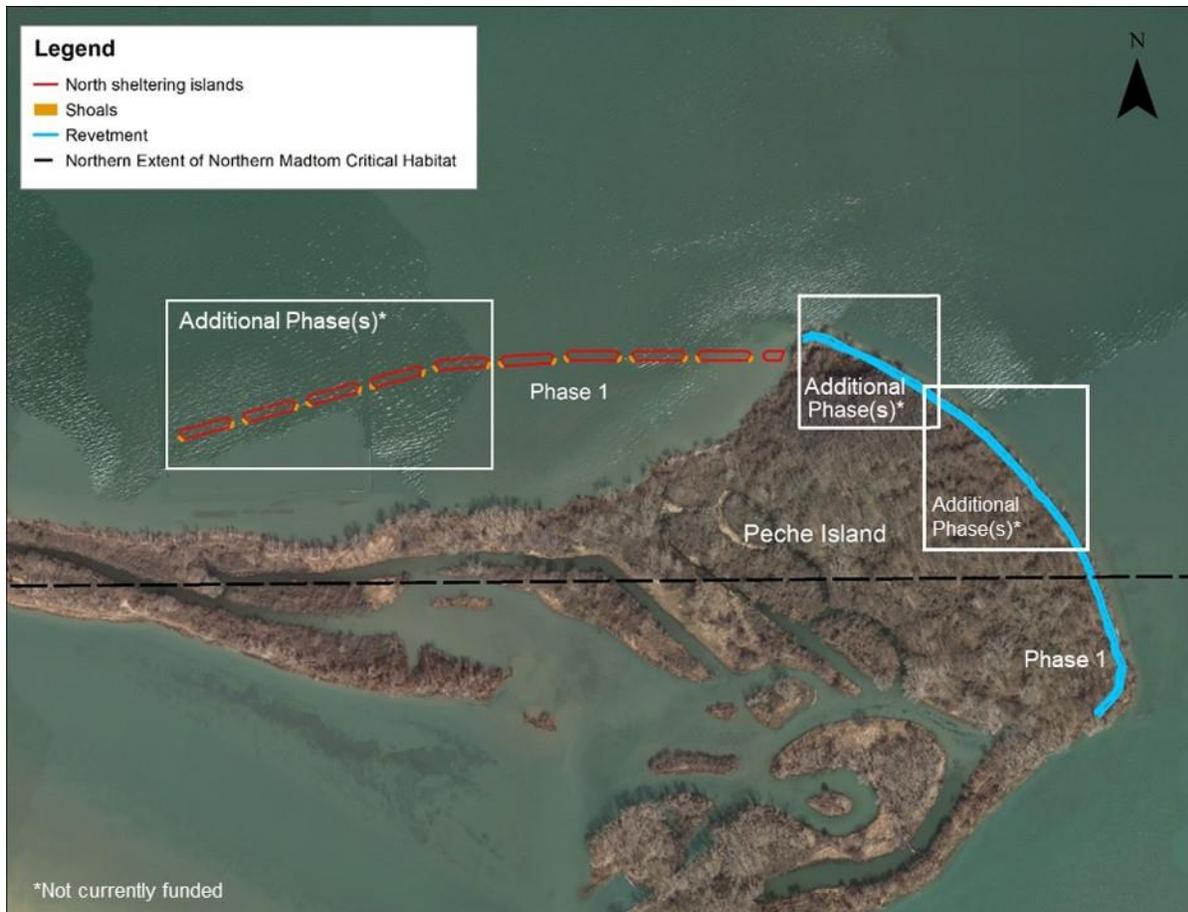
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Drone photo of the construction of one of the sheltering islands at Peche Island



Construction of the Peche Island project in October 2020



Site plan for Peche Island project



2021 Briefing Update

Agency

Environment and Climate Change Canada; Detroit River Canadian Cleanup

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Title

Tree Swallow studies

SCDRS Initiative Objective(s)

Complete remedial actions to remove bird or animal deformities or other reproductive problems BUI

Update

A third and final year of tree swallow monitoring is planned for 2021. Data will be collected on reproductive success (clutch size, hatching success, fledging success, weight at fledging) and contaminants in eggs including PCBs, Mercury, and PBDEs.

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2021 Briefing Update

Agency

Detroit River Canadian Cleanup; Ontario Ministry of Environment, Conservation, and Parks; Environment and Climate Change Canada

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Title

Fish Tumour and Other Deformities BUI Update (Canadian Detroit River AOC)

SCDRS Initiative Objective(s)

Complete remedial actions to remove fish tumors and other deformities BUI

Update

In the 1980s, internal and external tumours and deformities in fish in the Detroit River were found at elevated rates. These deformities can be caused by pollution and sediment contamination. Although contaminants are still present in sediments in the Detroit River Area of Concern (AOC), the prevalence of tumours in brown bullhead (our indicator species) are decreasing. In part, this is due to legislation introduced by both Canadian and U.S. authorities to restrict the discharge of many pollutants into the river. Researchers from the Great Lakes Institute of Environmental Research examined liver tumours in brown bullhead caught in the Detroit River. Results show that liver tumours in brown bullhead have decreased to less than 1% (1 of 112) - a rate that is lower than the Great Lakes background of 2%. These results indicate that liver tumours in the Detroit River are no more prevalent than other Great Lakes sites, and the Fish Tumours and Other Deformities beneficial use is no longer considered impaired for the Canadian side of the Detroit River as of December 2020.

www.detroitriver.ca



2021 Briefing Update

Agency

Environment and Climate Change Canada; Detroit River Canadian Cleanup

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Title

Colonial Waterbird studies

SCDRS Initiative Objective(s)

Complete remedial actions to remove bird or animal deformities or other reproductive problems BUI

Update

Environment and Climate Change Canada's (ECCC) wildlife toxicologists have completed a three-year investigation into the reproduction and contaminant exposure in nesting colonial waterbirds in the AOC. A small colony of double-crested cormorants was studied on the U.S. side of the Detroit River as a surrogate colony for the Canadian side of the Detroit River. Freshly-laid eggs were collected from this surrogate colony, a downstream colony in western Lake Erie, and two reference colonies (one in eastern Lake Erie and one off-lake; Lake Huron), artificially incubated in the laboratory and assessed for embryonic survivability, embryonic deformities, and contaminant concentrations. Since there are currently no nesting colonies of herring gulls in the Detroit River, two surrogate AOC colonies of herring gulls were studied in western Lake Erie, where productivity was assessed, and 21-day-old chicks were examined for deformities.

Overall, the survivability for cormorants was 83% at the Detroit River colony and was similar to that found at the reference colonies in three study years combined. The percent of cormorant embryos that had deformities was 6% at the Detroit River colony compared to 4% at the downstream colony and 0% at the reference colonies. Herring gull hatching at the surrogate colonies exceeded levels required to maintain a stable population and no deformities were found in 21-day-old herring gull chicks in two study years. Based on published effect-level thresholds associated with adverse impacts on avian reproduction, concentrations of contaminants in cormorant eggs and embryos from the Detroit River colony were not sufficiently elevated to adversely impact the reproductive success of cormorants nesting. These results support a recommendation of no impairment for reproduction associated with contaminant-induced effects in colonial waterbirds nesting in the AOC. Other stressors, such as loss of

habitat and reduced food availability are likely more important factors in influencing successful nesting of colonial waterbird populations in the Detroit River.

www.detroitriver.ca



2021 Briefing Update

Agency

Essex Region Conservation Authority; Detroit River Canadian Cleanup; Environment and Climate Change Canada

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Title

Collavino wetland

SCDRS Initiative Objective(s)

Complete habitat improvement projects to remove loss of fish and wildlife habitat BUI

Update

The management of the Collavino wetland project at the mouth of the Canard River is ongoing. The Collavino wetland is 30 hectares in size and is designated as a Provincially Significant Wetland. In 2019, with funding support from Environment and Climate Change Canada (ECCC), Essex Region Conservation Authority (ERCA) repaired the existing dyke and installed pumping infrastructure and water level control structures to manipulate water levels on the inside of the dyke. Further, a baseline wetland health assessment was conducted by ECCC prior to implementation of the management plan to evaluate the efficacy of restoration actions. In 2020, ERCA began executing the management plan for the wetland, which includes drawing down water levels and conducting a prescribed burn to reduce the invasive *Phragmites australis* in the wetland. The management plan is expected to increase native plant presence within the wetland to improve habitat use.

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