



Fish Habitat Enhancement Strategies for the Huron-Erie Corridor for the Great Lakes Restoration Initiative

This project is funded by the Great Lakes Restoration Initiative (GLRI), an interagency program that addresses the most significant environmental problems in the Great Lakes ecosystem. Results from U.S. Geological Survey (USGS) scientific studies and monitoring are helping guide the restoration effort. The GLRI is made up of five focus areas that address these issues:

- Cleaning up toxic substances and areas of concern
- Combating invasive species
- Promoting nearshore health by protecting watersheds from polluted runoff
- Restoring and protecting habitats and wildlife
- Tracking progress and working strategically with partners

More information is available on the USGS GLRI Web page (<http://cida.usgs.gov/glri/>).

Project Background



The Huron-Erie Corridor is home to over 65 species of fish and is an important economic center in the U.S. and Canada.

The Huron-Erie Corridor (HEC) is the connecting channel between Lake Huron and Lake Erie, including the St. Clair River, Lake St. Clair, Detroit River, and western Lake Erie. The HEC contains the largest freshwater delta in the Great Lakes, supports over 65 species of fish, 16 of which are classified as threatened or endangered, and is one of the busiest navigation centers in the United States. Historically, the HEC supported a highly productive fishery, providing spawning and nursery habitat for 80 fishery species, including lake trout, lake sturgeon, lake whitefish, lake herring, walleye, and yellow perch. Unfortunately, over the last century, fish productivity in the HEC has been dramatically reduced due to construction of shipping channels, which severely altered fish spawning grounds and nursery habitats.

The goal of this GLRI project is to enhance native fish populations through restoration of fish spawning and nursery habitats in the HEC and St. Clair and Detroit Rivers Areas of Concern (AOCs). The USGS is providing vital information to define restoration targets in AOCs, and is measuring restoration success through pre- and post-habitat construction assessments. This work is being completed as part of the greater Huron-Erie Corridor Initiative (<http://huron-erie.org/>), a highly collaborative initiative started in 2004 by the USGS Great Lakes Science Center and over 20 partners to restore habitats and native fish and wildlife species in the corridor, ultimately providing societal, economic, and environmental benefits to the Great Lakes region.

Objectives and Approach

Objective:

The main objective of this project is to identify locations within the St. Clair and Detroit Rivers that provide the best opportunities for remediation of fish spawning and nursery habitats, with the ultimate goal of enhancing native fish populations.



The Huron-Erie Corridor is the connecting channel between Lake Huron and Lake Erie, including the St. Clair River, Lake St. Clair, Detroit River, and western Lake Erie.

Approach

Information about existing river habitat, current patterns, fish nursery areas, movements, spawning, and early life habitat requirements are being used in adaptive management models to identify areas suitable for creation or restoration of fish habitats. Physical and biological information are being coupled to show where and how habitat restoration will produce the strongest benefits to native fishes at multiple locations in the St. Clair and Detroit Rivers. This project also addresses AOC delisting goals in the St. Clair and Detroit Rivers by mapping current areas of fish habitat, identifying sites for habitat restoration, and examining connectivity to surrounding habitats.



Sunset over the Huron-Erie Corridor.

Outcomes

This project is remediating some of the effects of development (e.g., shoreline hardening, channelization, infilling of wetlands) over the last century on native fish species and their habitats in the HEC. Scientists are identifying remaining habitat fragments and new areas where habitat restoration could produce self-sustaining populations of native fishes.

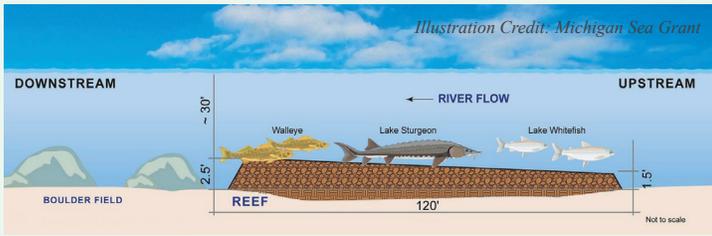


Illustration of a restored fish spawning reef.



Lake sturgeon collected in the Detroit River after the first round of fish habitat restoration in the Huron-Erie Corridor. This GLRI project is leading the way for restoration of additional fish habitat in the St. Clair River and Lake St. Clair, continuing past restoration successes.

Information gained from previous research conducted by the USGS Great Lakes Science Center and partners in the Detroit River resulted in the construction of two fish spawning reefs that are used by at least 14 species of native fish, including economically important walleye and lake sturgeon (threatened in Michigan and Ontario). This project builds upon previous work by expanding the spatial scope of restoration to include the St. Clair River and Lake St. Clair.

Habitat assessment and restoration techniques developed in the HEC through this project could be applied to other Great Lakes connecting channels, such as the St. Marys and Niagara Rivers, and the Welland Canal. To ensure that information generated through this project is accessible by local communities, an outreach partnership with Michigan Sea Grant has been developed. Ultimately, this work will enhance ecologically and economically valuable fish populations in the HEC, and contribute to the revitalization of the region.



Fish eggs (left) and embryos (right) collected on restored spawning habitat in the Huron-Erie Corridor.

Recent Highlights

The USGS conducted intensive surveys in the St. Clair and Detroit Rivers in 2010-2012 to assess the extent of fish spawning and nursery habitat use. Data gathered from these surveys were used in geographic, hydrodynamic models that predicted lake sturgeon, walleye, and lake whitefish spawning areas that would be suitable for spawning reef construction.



Researchers sampling larval fish.

The USGS continued to measure the extent of fish spawning and abundance of larval fishes in 2012 at more than 20 sites in the Detroit River and western Lake Erie. Ongoing sampling at these sites is providing information on the timing and spatial distribution of fish spawning, fish eggs, and larvae necessary for restoration efforts.



An endangered Northern madtom.

Assessment data have revealed that madtoms use the constructed reefs created in the Detroit River. Additionally, multiple lake sturgeon in spawning condition were collected on restored habitats. The first collection of juvenile lake sturgeon was made in the Detroit River during 2010, suggesting successful spawning of sturgeon on restored habitat. Juvenile lake herring were also collected in the St. Clair and Detroit Rivers during 2011 and 2012.

The USGS, in collaboration with management agency partners, began developing a conservation action plan during 2012 to provide a fine-scale assessment of the St. Clair and Detroit Rivers. The conservation action plan will identify knowledge gaps and aid in future monitoring and the prioritization of restoration efforts within the system.



Restoration of spawning habitat in the Huron-Erie Corridor provides greater fishing opportunities in the Great Lakes region for commercial fishes, such as whitefish (left), and sport fishes, such as walleye (right).



Contact:
Norman G. Grannemann
6520 Mercantile Way
Lansing, MI 48911
ngranne@usgs.gov
517-887-8936