

Frequently Asked Questions

About the Detroit and St. Clair River Fish Spawning Reef Projects

We have compiled the following questions and answers based on questions we have been asked or anticipate about the projects. Please contact us if you have any questions that are not answered here.

What is a fish spawning reef?

Many fish use rocky areas for spawning — laying and fertilizing their eggs. The spawning reefs that we are installing recreate these natural spawning areas and consist of loose rock strategically placed on the river bottom. The rock will provide a safe place for the eggs to incubate until they hatch and larvae drift down the river. The construction of commercial shipping channels removed much of the rocky habitat that historically existed in the St. Clair and Detroit rivers.

Where are reefs being built?

After carefully evaluating the fish populations and physical conditions throughout the St Clair and Detroit rivers, the project team selected three locations to create fish spawning reefs in 2014 and 2015:

- The Harts Light Reef is located between St. Clair and Marine City, offshore from homes along River Road in East China, Michigan. This project was completed fall 2014.
- The Pointe Aux Chenes Reef is located between Algonac and Russell Island, adjacent to St. Clair River Drive (M-29), more than 300 feet upstream from the Russell Island Ferry. This project was completed summer 2014.
- The Grassy Island Reef will be located just upstream of Grassy Island off shore of the Ecorse Creek outlet to the Detroit River. Construction proposed for spring 2015.

These locations are all deep, with clean, fast-flowing waters that will keep the spawning reefs clean and will help oxygenate fish eggs that are deposited on the reefs.

Who is involved in this project?

We are part of a research team made up of local, state, national and private partners working to bolster the local fish populations. The team includes scientists from the U.S. Geological Survey (USGS), the U.S. Fish and Wildlife Service, the University of Michigan, JJR SmithGroup and the Michigan Department of Natural Resources (DNR). Faust Corporation was selected to build the St. Clair River reefs through a competitive bidding process. Funding is from the federal Great Lakes Restoration Initiative with additional support from the cooperating agencies.

What size are the reefs?

- The Harts Light Reef is 3.8 acres: 1,007 feet long, 165 feet wide and 2 feet tall.
- The Pointe Aux Chenes Reef is 1.5 acres: 605 feet long, 108 feet wide and 2 feet tall.
- The Grassy Island Reef will be approximately 4 acres: approximately 1,000 feet long, 175 feet wide and 2 feet tall.

What type of rock is used and where does it come from?

The St. Clair River fish spawning reefs are made of broken limestone, about 4 to 8 inches in diameter. The rock is from quarries in Bay Port and Ottawa Lake, Michigan, and was transported by truck to staging areas along the shoreline of the rivers. The rock is inspected before it is used and will not affect water quality.

How will the spawning reefs be constructed?

Two construction methods were used for the St. Clair River reefs. For the Pointe Aux Chenes reef, rock was placed on the river bottom using a crane mounted on a barge. A GPS-guided clamshell shovel placed the rock at the locations specified by the project plans. Another barge brought rock from the shoreline to the reef site using a tugboat.

For the Harts Light reef, rock was placed using a side dump barge and then a beam was dragged over the surface to smooth the bed of rock. A variety of survey methods are being used to check that the reefs are built according to the team's design.

A contractor has not yet been selected for the Grassy Island reef, so final logistics and construction methods have yet to be determined, however, it is likely that similar technology and construction approach will be used.

When will construction begin and how long will it last?

- Construction at the Pointe Aux Chenes site in Algonac lasted about 6 weeks and was completed in September 2014.
- Construction at the Harts Light reef site in East China lasted about 6 weeks and was completed in November 2014.
- Construction at Grassy Island is likely to last 6-10 weeks and will take place in 2015.

The construction timelines are approximate and unforeseen challenges may extend the work. The construction vessels will only be on the water during daytime working hours, Monday through Friday. All vessels will be docked at night and on weekends.

What species of fish will use the reefs?

These fish habitat projects were designed to enhance the reproduction of lake sturgeon (a state threatened species), walleye (a popular sport fish) and lake whitefish (a commercially harvested fish). These three species, as well as a number of suckers, catfish and perch, seek out rocky areas in fast-flowing water to deposit their eggs and have been observed using completed reef projects.

Why is this project needed?

Over the past 100 years, both the St. Clair and Detroit rivers have been extensively modified by human activities. For example, the river bottoms were dredged to create deep channels for large, commercial ships and to mine gravel, which damaged the rocky and gravel areas where millions of fish spawned (reproduced). These and other factors led the St. Clair and Detroit rivers to be listed as Areas of Concern under the Great Lakes Water Quality Agreement, and federal dollars are now available to remediate fish and wildlife habitat. Unlike the St. Clair and Detroit rivers, most other large rivers have dams that block access to historical spawning areas, making it especially important to remediate fish habitat in the St. Clair and Detroit rivers where access to spawning areas is not restricted.

Researchers have determined that additional rocky spawning habitat is needed to increase the reproduction of native fish and help restore fish populations in the rivers. Currently, many fish spawn near the Bluewater Bridge at the head of the St. Clair River because it is one of the few optimal spawning sites in the region. Spawning reef construction will diversify the type and locations of spawning habitat available and will make the system more resilient to potential future changes.

How do these reef projects differ from other restoration efforts?

The projects described in this FAQ are designed to create habitat that is needed by a particular group of fish that deposit their eggs on rocks in fast-flowing waters, including lake sturgeon, walleye and lake whitefish. Research shows that in the St. Clair and Detroit rivers, these fish select deep water sites for spawning, and natural and constructed reefs in deep water remain free of algae that could make the habitat unattractive to these fish.

Federal restoration programs are also supporting projects designed to improve shoreline and shallow water habitat of the rivers, such as those in Port Huron, Marysville and Clay Township. Some of these projects include rock material that is helping make shorelines more natural and provide habitat for small fish and other aquatic life. By creating and restoring a variety of habitat types in the river we can sustain many different species of native fish.

The St. Clair and Detroit rivers are different; how does this affect restoration?

Both the St. Clair and Detroit rivers have been designated federal Areas of Concern under the Great Lakes Water Quality Agreement, and efforts are underway to correct the loss of historical fish and wildlife habitat in both rivers. However, the riverbed geology and fish communities are unique in each river, which influences the way we plan restoration efforts.

For example fish spawning habitat has been damaged in different ways — gravel mining was widespread in the St. Clair River and blasting of limestone shelves was extensive in the lower Detroit River. We also know that currently there are more lake sturgeon in the St. Clair River and more walleye and lake whitefish in the Detroit River. Knowledge of historical changes and the current fish community helps the team set realistic objectives for restoration efforts. In general, the goal is to enhance the reproduction of a number of target native fish species, while diversifying the type of habitat and the fish community in a given area.

The St. Clair River already has a large population of lake sturgeon, why create spawning reefs?

The St. Clair-Detroit River System is home to approximately 50,000 adult lake sturgeon, which is one of the largest populations in the Great Lakes, and sturgeon from other areas migrate to the rivers to spawn. However, current sturgeon populations are roughly 1 percent of what they once were in the Great Lakes. Scientists anticipate that bolstering populations of lake sturgeon in the St. Clair and Detroit rivers will help repopulate other parts of the Great Lakes. In addition to lake sturgeon, constructed spawning reefs have been shown to benefit a number of other native fish such as walleye and lake whitefish. Currently, relatively few walleye and lake whitefish spawn in the St. Clair River, but spawning reef construction could increase their numbers.

How will you know the reefs are working?

The project team will perform ongoing monitoring and evaluation of these reefs as well as at additional sites of three completed habitat projects in the St. Clair and Detroit rivers. Project scientist will study the numbers and types of adult fish, eggs and fish larvae in the area before and after the spawning reefs are created. Data is collected at the reef site during spring and fall spawning seasons and compared to reference areas without spawning reefs using scientific methods. In addition, underwater cameras, sonar and scuba divers will be used to evaluate how well the reef material stays clean over time.

Will young fish produced by the constructed reefs find enough nursery habitat?

Fish need access to different types of habitats during their life span in order to successfully survive and reproduce. Wetlands provide nursery habitat for many types of young fish, however there are relatively few remaining wetlands along the St. Clair and Detroit rivers. The team uses hydrological models and a variety of sampling equipment to predict and study the movement of larval fish that emerge from eggs deposited on the reef. For example, larval fish from the St. Clair River reefs are expected to settle in the river, delta wetlands and open waters of Lake St. Clair, and a number of sturgeon larvae have been caught in these locations. In addition, evidence suggests that fish larvae produced on spawning areas under the Bluewater Bridge of the St. Clair River are able to successfully migrate downstream and find suitable nursery habitat.

Will sand or silt build-up in the reefs?

The likelihood of sediment building up in and around a constructed reef is an important consideration when planning a restoration project. Each completed reef project has generated important lessons that are applied in subsequent projects, following an adaptive management approach. Over the past 10 years, the team has completed three spawning reef projects and two of the projects have accumulated more sediment than expected, including projects in the Middle Channel of the St. Clair River and near Fighting Island in the Detroit River.

These two spawning reef projects included 9-12 experimental reef beds spread across the channel, allowing the team to evaluate fish preferences for different rock types and locations within the channel. The cross channel layout was used to maximize opportunities for fish to pass over and notice the constructed habitat. However, we have seen that sand is accumulating in the reef beds located in parts of the channel with slower moving water and higher sediment movement, while other beds remain clean and continue to provide fish habitat. Despite some sand build-up, the exposed portions of the Middle Channel reef is still larger than the only other known sturgeon spawning site in the St. Clair delta region (the Mazlinkas Reef in the North Channel) and it allows fish larvae to now colonize a new part of the delta wetlands.

As a result of the experimental design of these early projects, the team now uses an optimal rock type to construct a single long, narrow reef bed that is oriented parallel to the current in a spot with ideal conditions. Based on these early experiences, we have also significantly enhanced our site selection and assessment processes to ensure that we understand potential sources of sediment, where sediment is regularly deposited and whether modifications to the river bottom are likely to cause sediment to settle. Sidescan sonar, underwater video, acoustic Doppler current profilers, hydrodynamic models and a range of fish sampling gear are used to evaluate potential reef locations.

Sediment build-up is likely to be a problem in areas where the river is carrying large amounts of sediment and is near its capacity, such that small changes in water velocity could cause the river to drop some of that load. A number of observations help us identify erosional areas where a constructed reef is likely to be scoured clean, including fast water; a hard, stable river bottom with relatively little loose sediment; and, an absence of upstream sources of sediment. However, some amount of sediment deposition is expected with every constructed spawning reef and has been incorporated into the design and planning.

Will the projects affect shipping or boating, or change the flow of water?

No. The reefs are located in waters 26-50 feet deep, and they only rise 2 feet above the river bottom. The reefs will not interfere with personal boats or freighters. Both projects have been carefully reviewed by a number of agencies, and all analyses indicate that there will be no detectable effect on water flow or water levels in the river.

Will these projects improve fishing?

Eventually. The spawning reefs are designed to enhance the reproduction of specific types of fish such as lake sturgeon. Most of these fish will only spend time on the reefs during spawning season, and therefore, fishing directly above the reef is not expected to be exceptional. However, over time, the projects should improve fishing in the St. Clair River and Lake St. Clair. After many years, the spawning reefs could expand the fishing opportunities for lake sturgeon, the largest fish in the Great Lakes that currently provides a unique — but tightly regulated — fishing experience.

How else will these projects benefit people?

These spawning reef projects are part of a large effort to remediate the St. Clair River and Detroit River, and remove the areas from the federal list of Areas of Concern. Despite a variety of changes to the shoreline and water quality, the river is home to the largest remaining population of lake sturgeon in the Great Lakes. Projects like this help improve the region's environment, and unique fish and wildlife populations can boost the region's identity and reputation, and ultimately help attract talented people and businesses.

Where can I find more information?

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