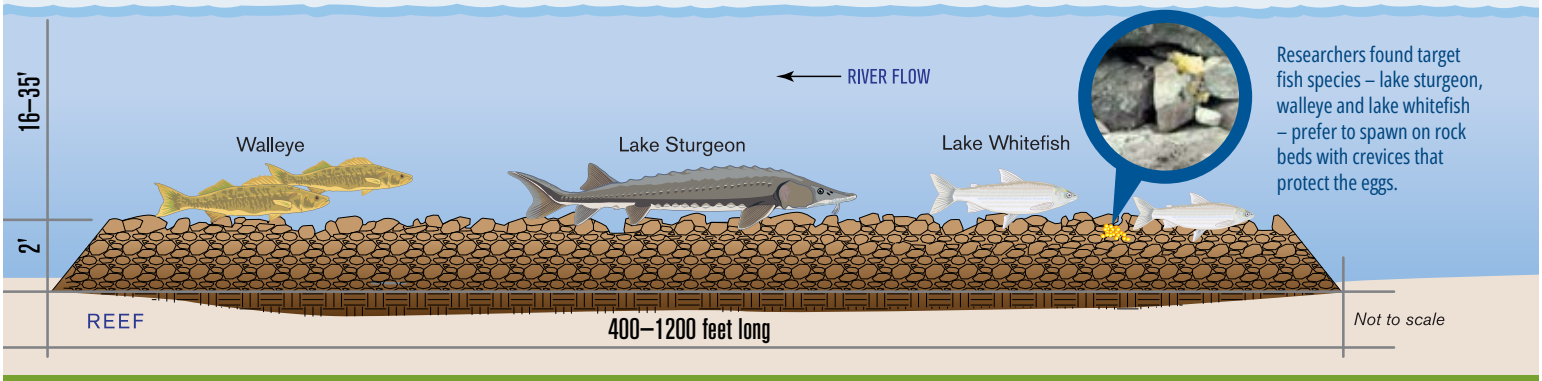
# RESTORING FISH HABITAT IN THE ST. CLAIR AND DETROIT RIVERS




**Artificial spawning reefs are benefiting lake sturgeon and other native fish in the St. Clair and Detroit rivers.**

## AN ABUNDANCE OF FISH

Lake sturgeon were abundant in the Great Lakes for thousands of years, serving as an important food source and cultural touchpoint for Native American tribal nations. Historically, the St. Clair and Detroit rivers supported a diverse and productive fishery. Lake sturgeon, walleye, and lake whitefish traveled to these rivers to spawn (reproduce), depositing and fertilizing their eggs in rocky areas with fast-flowing currents.

Construction of the Livingstone Channel in the Detroit River.

However, beginning in 1874, both the St. Clair River and Detroit River were extensively modified. The river bottoms were dredged to create deep channels for large, commercial ships. The dredging and disposal of dredged materials such as dirt, sediment, and rocks changed the flow of the river and damaged the natural limestone river bottom where millions of fish spawned. These and other impacts — including overfishing and shoreline development — have dramatically reduced the populations of native fish, particularly lake sturgeon.

Despite the decline, the St. Clair and Detroit rivers continue to support one of the largest populations of lake sturgeon remaining in the Great Lakes, in part because neither river has dams that block access to historical spawning areas.

## LOST SPAWNING HABITAT

Scientists analyzed the damage done to historical spawning areas and searched for the few places where native fish still reproduce. A focus has been on sturgeon since they are listed as threatened or endangered by most Great Lakes states and Ontario.

The team found that more than 60 miles of the Detroit River have been dredged, which destroyed natural limestone reefs in the Livingstone Channel.

Today, the remaining lake sturgeon spawn in only a few locations in the St. Clair and Detroit rivers. Because very few natural rocky areas remain, sturgeon have been found depositing their eggs on some unusual materials. For example, coal cinders that were dumped in the river when ships unloaded near Algonac, Michigan, are used as spawning sites.

Many natural resource professionals believe that creating structures that mimic the lost natural limestone reefs may help rebuild populations of native fish.

## LEARNING TO RESTORE

Between 2004 and 2018, a team of scientists completed eight reef habitat projects in the St. Clair and Detroit rivers, totaling over 20 acres of new reef habitat. The team members took an adaptive management approach, questioning and evaluating as they went along.

### What type of rock should be used?

Initial reefs were constructed using different types of rocks. Based on these early projects, the team discovered that target fish species — lake sturgeon, walleye, and lake whitefish — weren't

## FASCINATING FISH

To help lake sturgeon recover, scientists study their life cycle, movement, and habitat requirements.

Lake sturgeon are unlike any other Great Lakes fish — they can grow up to 7 feet long and can weigh up to 300 pounds. They are slow to mature: females can take 20-25 years to reach reproductive age, while males may take 15 years to reach reproductive age.

On average, females spawn only once every four years, and males typically spawn every other year. Female sturgeon live 80-150 years, while males live about 55 years.

Although lake sturgeon look somewhat like sharks, they don't have teeth. Instead, they suck up invertebrates from the bottom of the river or lake.

Lake sturgeon are considered threatened or endangered in seven of the eight Great Lakes states, and estimates indicate that their population is now 1 percent of what it once was.

Despite strict restrictions on fishing and improvements in water quality, lake sturgeon recovery has been very slow, in part because sturgeon take decades to reach reproductive age.

picky, as long as the rocks remained relatively free of silt, algae, and mussels, and were piled deep enough to form crevices that protected their eggs.

The reefs also needed to be unfavorable to invasive species with certain rock preferences. For example, sea lamprey build nests in gravel under 1-2 inches in diameter, and round goby prefer of piles of large rocks.

The conclusion: 4-8 inch limestone works best to encourage native species and discourage invasive species.

### Where should the reefs be built?

Areas with strong currents and deep waters are ideal places to create spawning habitat. Scientists at the U.S. Geological Survey (USGS) developed a computer model using water depth and flows in the St. Clair and Detroit rivers to predict where lake sturgeon would spawn if the river bottom were suitable. Project partners used the model to identify high-priority places for constructing reefs, then selected specific locations without contaminated sediments or heavy boat traffic.

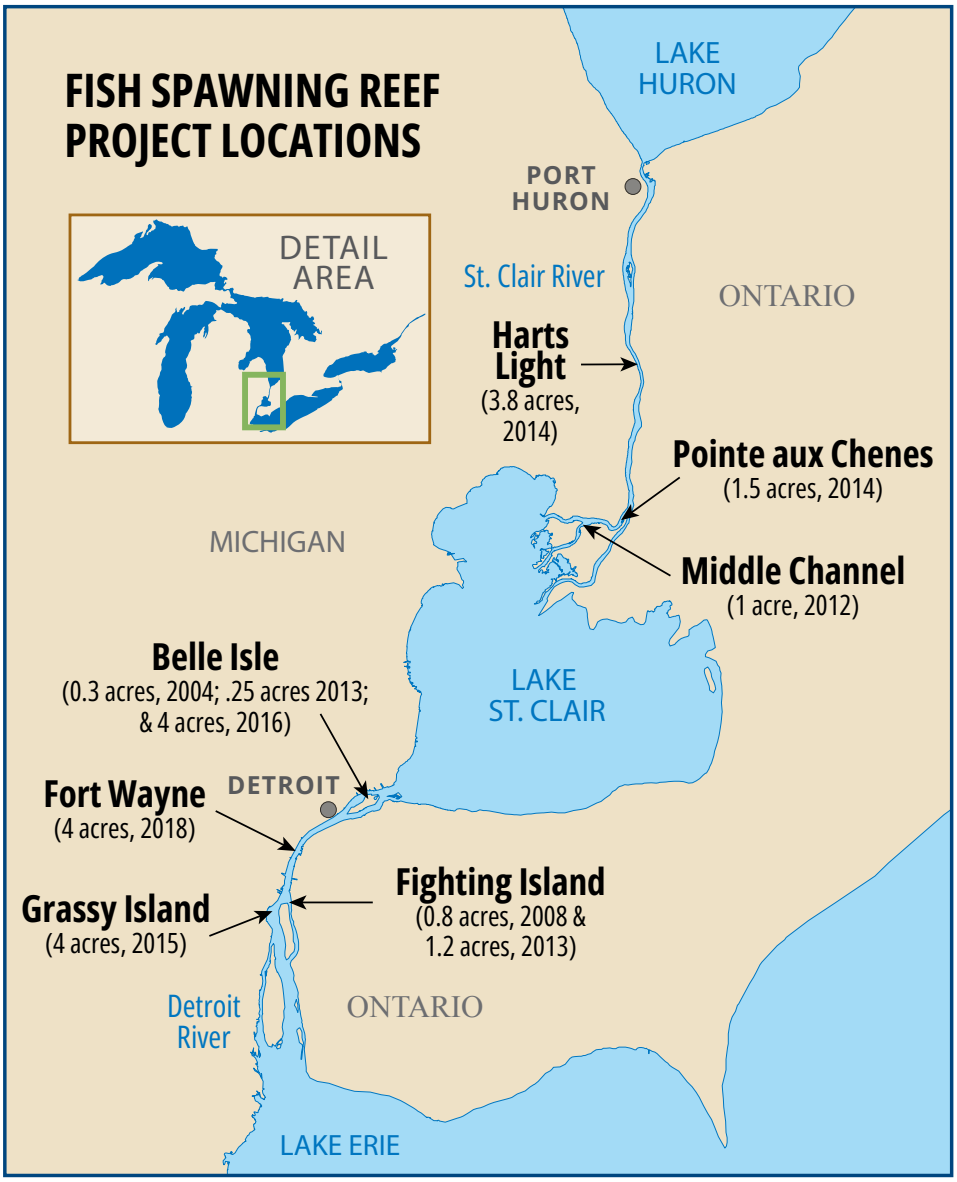
They scanned potential reef sites with underwater cameras and sonar to make sure the river bottom was hard, smooth, and not already used by fish. When possible, reefs were placed close to known spawning areas and upstream of wetlands that could protect young fish after they hatch.

### How do we know the reefs are effective?

A diverse team of scientists study the river before and after reefs are established. They use a variety of techniques to determine if fish are depositing eggs on the reef, if the eggs produce healthy young fish, and which adult and juvenile fish are on or near the reefs.

## CURRENT ACTIVITIES

The team continues to assess completed reef projects by sampling eggs, juveniles, and adults near the reefs and in the St. Clair and Detroit rivers. Every five years the physical condition of the reefs will be examined using underwater video and sonar. While there are no current plans for other reefs in the St. Clair or Detroit rivers, the team shares their lessons and experiences with other groups to help add lake sturgeon spawning habitat to more rivers around the Great Lakes.

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

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