



Helping The Ancient Sturgeon



The lake sturgeon (*Acipenser fulvescens*), one of four freshwater sturgeon inhabiting the waters of North America, is the largest fish and the only sturgeon found in the Great Lakes. Lake sturgeon are an ancient and primitive fish belonging to a group that predates the dinosaurs by many millions of years. These fish possess a number of “primitive” traits that easily set them apart from other fishes, namely a cartilaginous skeleton, spiral valve intestine, and a heterocercal tail. In addition, lake sturgeon have an elongated snout with four barbels preceding their ventral protrusible mouth and rows of bony scutes along their body. Lake sturgeon are long-lived fish, not attaining sexual maturity until about 15 years in males and 25 years in females. They can grow to eight feet in length and weigh as much as 300 pounds at maturity. Although they are very large, these fish feed on small animals, using their prehensile lips to vacuum mussels, snails, crustaceans, insect larvae, and small fish off the bottom. The mussels, snails and crustaceans are crushed in a muscular crop, or gizzard, before being passed on to the stomach. Although lake sturgeon live in the lakes, they must enter rivers in early spring to spawn. They spawn on gravel bars where millions of small (4mm) eggs are deposited on gravel in fast flowing water. The eggs are coated with a sticky covering that helps them stay attached to the gravel. After a few days, this coating ruptures and the eggs sink into the gravel where they hatch. The newly-hatched young remain in the gravel, living off of the nutrients in their yolk sacs, until their eyes and mouths develop and they can capture their own food. The young sturgeon then remain in the rivers for a number of years before venturing out into the lakes.

These fish were once extremely abundant in our waters and served as an important food source for many Native American tribes. Sturgeon were so abundant during the 18th century when Europeans were settling the Great Lakes region, that boaters were warned of the dangers of being capsized by jumping sturgeon during the spring spawning run.

Although once abundant these huge fish have suffered a drastic population crash, beginning in the mid- to late- 1800s due to a combination of habitat degradation and overexploitation. Commercial harvesting of lake sturgeon began in earnest in the mid 1800s. They were harvested for their eggs, which were made into caviar, and for their meat, which was smoked. They were also rendered for oil, and isinglass was made from their swim bladders (isinglass can be made into a clear gelatin or used in beer and wine manufacture as a clarifying agent). In 1880, over 4 million pounds of sturgeon were processed in Michigan, with all of the fish being taken from lakes Huron and St. Clair. In 1890 the total had dropped to under 2 million pounds, with fish being taken from all of the Great Lakes contiguous with Michigan; by the turn of the century the total harvest from all the lakes was less than 200,000 pounds. In 1909 the stocks in Lake St. Clair were so low that commercial harvesting was prohibited in the U.S. By 1928 the total harvest from all the lakes was less than 2,000 pounds and the commercial taking of lake sturgeon was prohibited. In 1951, the commercial ban on lake sturgeon was lifted from all of the



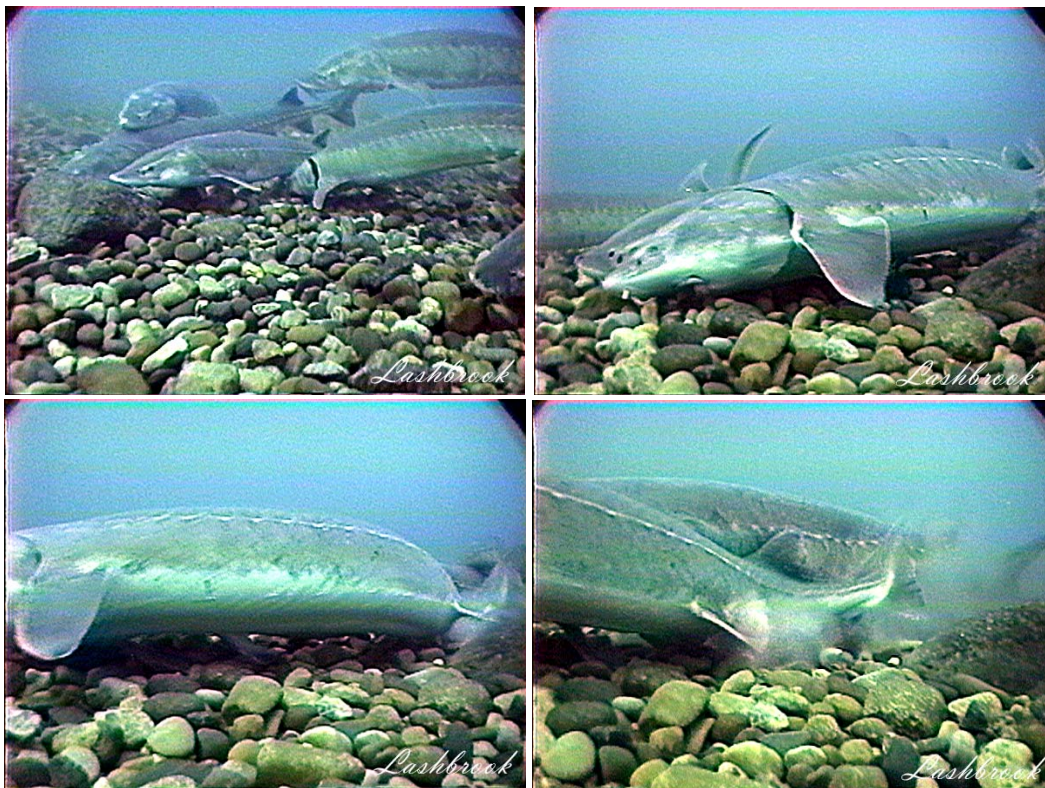
lakes except Lake St. Clair, and harvests of from one to six thousand pounds per year were taken until 1970, when the commercial ban on lake sturgeon was reinstated. There is still a ban on the commercial take of sturgeon in U.S. waters, but a limited harvest is allowed in Canadian waters.

While the fishing pressure removed millions of adult fish, habitat alteration and degradation destroyed traditional spawning grounds. Spawning grounds in many rivers became inaccessible due to the construction of dams for electrical power generation, flood control, and navigation. Further habitat problems related to the industrialization of the Great Lakes watershed, increasing sedimentation and pollution levels on the spawning grounds in the Detroit and St. Clair rivers, rendered them unacceptable and unproductive.

The Detroit River, Lake St. Clair, and the St. Clair River ecosystem support the largest remaining population of free-ranging, river-spawning sturgeon in the Great Lakes. Management efforts designed to encourage the recovery of these unique animals are underway by a number of private, state, and federal groups, including Central Michigan University, the Michigan Department of Natural Resources, University of Michigan, the U.S. Fish and Wildlife Service, and the U.S. Geological Survey. At this time, these management efforts focus on tracking adults and identifying key spawning grounds. Restoration efforts focus on these two areas in order to determine two main factors: to find the critical spawning grounds, to determine the age structure and migration patterns of remaining fish. The tracking of adults is done by capturing lake sturgeon and tagging them so that they may be identified in future catches. These studies have found an increasing number of juvenile (2-3

year old) sturgeon, which indicates that at least some successful spawning is taking place. Other researchers are tagging the sturgeon with radio tags so that their movements can be tracked directly. At this time, we have no idea how far these fish range, and radio-tagging may help us to further understand their movements. An adult sturgeon was tagged in Lake Mendota, Wisconsin and was captured ten years later in Lake Erie.

Of the many historically known spawning sites in the inter-connecting channel system, only two are known to be active, and both are in the St. Clair River. One of these sites is near the Blue Water Bridge in Port Huron Michigan. This spawning site is in approximately 60 feet of water and is probably the most important existing site, due to the large number sturgeon that use it. Kathy Johnson and Greg Lashbrook first discovered and videotaped sturgeon spawning on this reef in the 1990s. The other site is on an artificial reef in the St. Clair River, near the opening into Lake St. Clair. This reef is composed of coal clinkers dumped in the river in the 1880s. This is a small reef and is used by approximately 30 fish per year. Zebra mussels and round gobies have colonized it. Current research is focused on determining how extensively this reef is used, how many eggs are deposited on the reef, and what the hatching and survival rates are. The investigators are also trying to determine what impact the invasive species are having on reproductive success at this site. Further research will focus on assessing the use of all historical spawning sites, as well as the search for new sites. Conservation efforts will then focus on restoring these reefs to enhance productivity. If the spawning sites can be restored, recovery will progress more quickly.



Spawning sturgeon