



Status: State threatened

Global and state rank: G3/S2

Family: Acipenseridae (Sturgeon family)

Other common names: Great Lakes Sturgeon, Rock Sturgeon, Rubbernose Sturgeon

Synonyms: This is the only sturgeon species native to the Great Lakes basin. The distinct shape of these fish and comparatively large size of adult lake sturgeon makes them hard to confuse with other Great Lakes fish species. Throughout its range it may be confused with the shovelnose sturgeon, *Scaphirhynchus platorynchus*. The lake sturgeon has a more rounded snout and caudal peduncle (area of body just before the tail fin) compared to the shovelnose sturgeon.

Total range: The historic range for this species extended from rivers of the Hudson Bay watershed in Saskatchewan and Manitoba, east to the St. Lawrence estuary, south throughout the upper and middle Mississippi River and Great Lakes basins, and included disjunct southern populations in the Tennessee, Ohio and lower Mississippi River drainages. It is now rare throughout its historic range, and populations are believed to be only one percent of their original size (Tody 1974). Southern populations have become rare and are threatened by extinction (it is now considered extirpated in Alabama). Lake sturgeon are state-listed as endangered in Iowa, Indiana, Illinois, Ohio, Missouri, Pennsylvania and Tennessee, and are state-

listed as threatened in Nebraska, New York and Michigan. The most significant occurrences for this species in the United States are currently in Michigan and Wisconsin. Canadian populations appear to be vulnerable to decline and/or extinction (Houston 1987).

State distribution: Lake sturgeon occur in the surrounding Great Lakes and in several inland lakes and rivers in Michigan. Lake Michigan populations have historically spawned along shorelines near Ganges, Pier Cove and Saugatuck (Allegan Co.); New Buffalo (Berrien Co.); Pentwater and Big Sable Point (Mason Co.); North and South Fox Island (Leelanau Co.); and South Haven (Van Buren Co., Organ et al. 1979). Lake sturgeon have also been reported in small numbers in Grand Traverse Bay, although no spawning areas have been documented. Lake Huron populations have been known to spawn in the Saginaw Bay area from Sand Point in Huron Co. to Fish Point in Tuscola Co. as well as in the St. Mary's River (Organ et al. 1979). Significant spawning grounds occur in Lake St. Clair (St. Clair, Macomb and Wayne Co.), in the St. Clair River (St. Clair Co.), and in the Detroit River (Wayne and Monroe Co.). The most recently documented spawning area along Michigan's Lake Erie shoreline is near Stony Point in Monroe Co., although activity in this area appears to have diminished or ceased since the 1970s.

Lake sturgeon are known historically from many Michigan lakes and rivers. Currently, spawning populations are known from only a handful of these areas, particularly in northern Michigan. River and lake systems with significant populations include the Sturgeon River



(Houghton and Baraga Co., Auer 1987 and 1988); Burt, Mullet and Black Lakes in the Cheboygan River system (Hay-Chmielewski 1987), the Menominee River (Menominee Co., Thuemler 1985), and Indian Lake and the Indian River (Alger and Schoolcraft Co., Bassett 1982). Lake sturgeon also occasionally occur and sometimes spawn in other major tributary rivers of the Great Lakes. However, the damming and impoundment of most Great Lakes tributary rivers generally precludes these areas as viable occurrence and spawning sites. Historically, spawning lake sturgeon were known from the Au Sable River (Lake Huron drainage); the Kalamazoo, St. Joseph and Galien Rivers (Lake Michigan drainage); and the St. Marys and Tahquamenon Rivers (Lake Superior drainage, Goodyear et al. 1982), although no recent spawning activity has been reported from these systems.

Recognition: Lake sturgeon are Michigan's only native sturgeon species and are easily distinguished from other Great Lakes native fish species. Lake sturgeon are characterized by a robust, torpedo-shaped body covered by five rows of bony plates, or scutes. The snout is pointed and cone-shaped with four barbels preceding a protrusible mouth. The tail is asymmetrical, with a longer upper lobe (heterocercal), a characteristic that this family of fish shares with sharks and other cartilaginous fishes. Young lake sturgeon have one or two large dark blotches and numerous small flecks over the body, while older individuals are generally uniformly gray, olive or reddish (Smith 1979). The scutes, or sculptured plates, are sharp and relatively prominent in young individuals, although they are smoother and partially overgrown with skin in older individuals. Lake sturgeon can reach a length of eight feet and weigh up to 300 pounds. Average individuals are from 20 to 55 inches long and weigh two to 60 pounds.

Best survey time/phenology: Lake sturgeon are best surveyed in the late spring and summer, provided that care is taken not to disturb spawning individuals.

Habitat: Lake sturgeon are generally bottom dwelling (i.e., benthic) and occur in large rivers and shallow areas of large lakes where small benthic organisms that serve as food are abundant (Harkness and Dymond 1961). They are most often associated with deep run and pool habitats of rivers (i.e., >5 ft deep) and generally avoid aquatic vegetation (Hay-Chmielewski and Whelan 1997). These deeper water habitats serve as important overwintering areas for lake sturgeon. In lakes, habitat use varies and depends on the habitats available. Gravelly tributary streams of rivers and lakes serve as spawning habitat, although rocky, wave-swept areas near lake shores and islands serve as spawning habitat when preferred habitats are unavailable.

Biology: Lake sturgeon are members of an ancient family of fishes, the Acipenseridae, that has existed since the Upper Cretaceous period 136 million years ago. They are opportunistic bottom feeders that forage over gravel, sand and/or mud substrates where they use their protrusible mouths to extract prey items. Prey are located using sensory barbels as the fish swim continuously along river and lake substrates. Small benthic organisms, such as snails, clams, crustaceans, fish, and aquatic insect larvae, serve as primary prey items for this species. Fish eggs are also taken during foraging, although the likelihood that lake sturgeon feed on eggs of commercially important species is low due to their tendency to forage in suboptimal spawning habitats (Scott and Crossman 1973). Lake sturgeon begin spawning migrations in May when water temperatures reach 10° to 12°C. Males typically reach the spawning grounds first, where fish congregate prior to spawning. These large fish have been observed leaping completely out of the water during prespawning and spawning congregations. Lake sturgeon apparently do not feed during the spawning period. Spawning occurs at temperatures between 13°C and 18°C (Scott and Crossman 1973, Basset 1982) over clean, rocky substrates in two to 15 ft of water in swift currents. Great Lakes populations are known to spawn in wave action over rocky areas or ledges along shorelines and islands (Scott and Crossman 1973). The females remain in spawning condition only briefly, and are often accompanied two males during actual spawning. Large females lay hundreds of thousands of black, adhesive eggs that are deposited and abandoned over a period of several days (Smith 1979). Eggs hatch in five days at water temperatures of 15° to 18°C. Juveniles grow relatively quickly for the first 10 years, slowing considerably thereafter. Sturgeons mature very slowly and seldom spawn before 20 years of age. Males become sexually mature at 14-16 years of age and 45 inches in total length. Females mature at 24-26 years of age and over 50 inches in total length. Females spawn infrequently, only once every three to seven years, while males may spawn every one to two years (Roussov 1957, Harkness and Dymond 1961).

Conservation/management: Three major obstacles to rehabilitating sturgeon worldwide are physical barriers to migration, loss of spawning and nursery areas, and fishing pressures (Rochard et al. 1990). Declining water quality, sea lamprey parasitism, zebra mussel colonization of spawning habitats, predation of eggs by round gobies, and contaminants are additional threats in the Great Lakes (Hay-Chmielewski and Whelan 1997). Life history attributes for this species, including late maturity, infrequent reproduction and lack of parental care for eggs or young, contribute to the decline of this species, providing very low potential for population growth. Population structure assessments and additional study of habitat requirements by all life stages of lake sturgeon are needed to enable managers to make well-informed



decisions in the conservation and management of this species. Spawning stream management and restoration can be promoted through conservation practices such as sand trapping, introduction of spawning gravel and cobble, riparian buffer management, and lowered levels of non point source pollution. Removal of barriers to migration and/or establishment of fish passage around barriers can enable migrations of lake sturgeon to viable spawning habitats in rivers. Additional population enhancements can be made through lake stocking programs and lake spawning area improvements. Illegal harvesting continues to threaten lake sturgeon populations and requires additional policing and enforcement to deter poaching. Regulations that allow no commercial harvest of lake sturgeon must remain in place until viable populations can be re-established in the Great Lakes.

Comments: Lake sturgeon live longer than all other freshwater fish (females 80 years of age have been documented), and can be accurately aged based on the number of annular rings present in the first pectoral fin ray (Currier 1951).

Research needs: Continued monitoring of tagged populations can greatly contribute to our understanding of the biology and ecology of this species. Such an understanding can help to facilitate the development of sound management practices to protect recovering sturgeon populations from over-exploitation.

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Abstract citation:

Goforth, R.R. 2000. Special Animal Abstract for *Acipenser fulvescens* (Lake Sturgeon). Michigan Natural Features Inventory. Lansing, MI. 4 pp.

Updated September 2000.

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Michigan State University Extension is an affirmative-action, equal-opportunity organization.

Funding for abstract provided by Michigan Department of Natural Resources-Forest Management Division and Wildlife Division.

