

MICHIGAN



2015 - 2025

ST. CLAIR - DETROIT RIVER SYSTEM

Wildlife Action Plan

Today's Priorities, Tomorrow's Wildlife

WHAT IS THE ST. CLAIR - DETROIT RIVER SYSTEM?

The St. Clair – Detroit River System connects the upper and lower Great Lakes and is the international boundary between the United States and Canada. The St. Clair River is the natural outlet of Lake Huron and flows approximately 40 miles in a southerly direction to Lake St. Clair. Prior to entering Lake St. Clair, the river becomes braided creating an extensive delta known as the St. Clair Flats. The Detroit River is the outlet of Lake St. Clair and flows 32 miles to Lake Erie. The habitats associated with these waters are complex and include Great Lakes Marsh, nearshore Littoral Zones, open lake and tributary habitats, and upland communities. The Great Lakes Marshes provide crucial habitat for many species of plants and animals, and represent the most biologically significant habitats for migratory birds in the region. The wetlands of the St. Clair Flats provide habitat for a diverse assemblage of mammals, birds, amphibians, invertebrates, and plants. Nearshore Littoral Zones and tributaries provide fish and amphibians with spawning and nursery areas. The open waters of the Detroit and St. Clair Rivers provide a broad array of habitat types and support diverse fish communities. The bays and wetlands along the river shores provide spawning and nursery habitats for multiple species and resting and foraging areas for migratory waterfowl. Tributaries to the St. Clair River include the Black, Pine, and Belle rivers which support several Species of Greatest Conservation Need. Other large tributaries within the St. Clair – Detroit River System include the Clinton and the Rouge Rivers. Rare natural communities found in the St. Clair – Detroit River System include lakeplain prairie, wet-mesic flatwoods, and southern hardwood swamp.



Canvasback



Mooneye



Northern Madtom



Smallmouth Bass

PLAN CONTRIBUTORS

Great Lakes Fishery Commission

Michigan Department of Environmental Quality

Michigan Department of Natural Resources

Michigan Sea Grant

U.S. Army Corps of Engineers

U.S. Fish and Wildlife Service

U.S. Geological Survey

WHY IS THE ST. CLAIR – DETROIT RIVER SYSTEM IMPORTANT?



Lake Sturgeon



Pugnose Minnow



Mudpuppy



Muskellunge

The St. Clair River, Lake St. Clair, and the Detroit River are ecologically and economically significant international waters that connect Lake Huron to Lake Erie. These waters are the connection between the upper and lower Great Lakes for commercial navigation and provide drinking water to millions of Michigan residents. Along this corridor there are many great places to recreate, including the Detroit River International Wildlife Refuge, Ottawa National Wildlife Refuge, numerous state parks, and many other conservation lands. The region is a recreational boating destination. It also supports the nation's most productive sport fisheries for Walleye, Bass, and Muskellunge (Manny 2003). The St. Clair – Detroit River System is a globally important breeding area for two hundred migratory bird species. Southeastern Michigan sits at the convergence of the Mississippi and Atlantic flyways, two major bird migration routes in North America (Bull and Craves 2003). People flock to the area during spring and fall bird migrations. The diverse habitats in the St. Clair – Detroit River System support 65 species of fish and numerous species of birds, amphibian, reptile, mammals, and mussels. The St. Clair River and delta are one of the few refuges in the Great Lakes that still contain healthy populations of native mussels. The St. Clair – Detroit River System provides world-class wildlife recreational opportunities and a hot spot for biodiversity, all within a short distance of the Motor City.

WHAT USES THE ST. CLAIR – DETROIT RIVER SYSTEM?

WHAT IS THE HEALTH OF THE ST. CLAIR – DETROIT RIVER SYSTEM?

The quality of the St. Clair – Detroit River System has been altered for many human uses. The rivers have been dredged to allow deep-draft navigation, wetlands have been drained and filled for agriculture, residential, and commercial development, shorelines have been hardened, and industrial pollutants have left a legacy of contamination. Fish and wildlife communities have been affected by loss of habitat, contaminated sediments, poor water quality, and unintended introduction of nonindigenous species. As a result, several Areas of Concern within the St. Clair – Detroit River System have been recognized by the United States and Canada: St. Clair River, Clinton River, Detroit River, and the Rouge River. Each Area of Concern has identified Beneficial Use Impairments, including loss of fish and wildlife populations and habitats. The United States and Canada have pledged their cooperation to restore these Great Lake connecting channels under the terms of the Great Lakes Water Quality Agreement (U.S. and Canada 2012). For example, binational efforts to restore impaired wetland and Lake Sturgeon spawning habitats are ongoing throughout the St. Clair – Detroit River System.



GOALS

- Reduce sources of nutrients, sediments, and other pollutants that impair water quality and aquatic habitats. [LEBCS; SCDRS]
- Protect, enhance, and restore habitats that support focal species. [LEBCS; SCDRS]
- Protect, enhance, and restore connectivity for focal species. [LEBCS; LS; SCDRS]
- Prevent the entry and establishment of new invasive species, and control the production and spread of existing invasive species. [AIS; LEBCS; SCDRS; TIS]

WHAT ARE THE ST. CLAIR - DETROIT RIVER SYSTEM FOCAL SPECIES?

Where we are now and what we think we can realistically achieve over the next 10 years.

Northern Madtom (*Noturus stigmosus*) State Endangered

This small member of the catfish family is readily recognized by three irregular dark saddle markings on the back located at the front of the dorsal fin, behind the dorsal fin, and near the tail. This species is found in small to large rivers with moderate to strong currents and substrates of sand, gravel, or rock. The Northern Madtom is nocturnal and avoids shallow waters during the day (Trautman 1981; Goodchild 1993; Latta 2005). There are only three known populations of Northern Madtom in Michigan, and they are rare or critically imperiled throughout their range.



● Northern Madtom Occurrence

GOALS

- Develop baseline distribution and relative abundance.
- Develop a better understanding of critical life history characteristics and habitat use.

GOALS

- Develop baseline understanding of distribution and relative abundance.
- Develop a better understanding of critical life history characteristics and habitat needs.

Mooneye (*Hiodon tergisus*) State Threatened

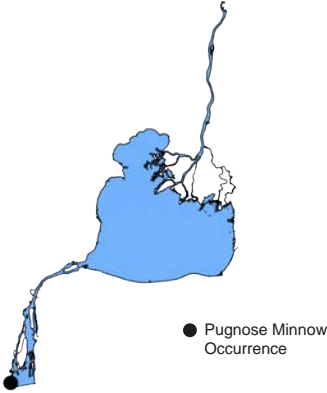
The Mooneye is a silvery, deep bodied, laterally compressed fish. It has a small, upturned mouth and distinct large gold-colored eyes. Although historically found in Lakes Michigan and Huron, recent accounts suggest that Mooneye only persist in the St. Clair-Detroit River System. The Mooneye is a surface-feeding fish occurring in clear large lakes and rivers with swift currents and firm substrate (Smith 1979); they appear intolerant of silt and turbidity (Trautman 1981; Smith 1985). Only two populations of Mooneye are known to exist in Michigan.



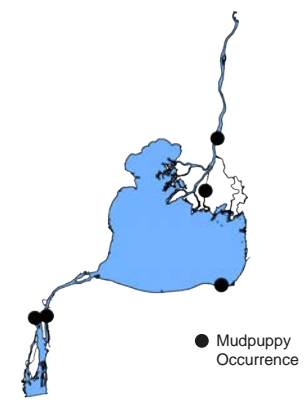
● Mooneye Occurrence

Pugnose Minnow
(Opsopoeodus emiliae)
State Endangered

The Pugnose Minnow is a small silvery minnow with a distinct black stripe running from the eye to the tail. As its name implies, the Pugnose Minnow has a bluntly rounded head and small upturned mouth. Adult Pugnose Minnows average two inches in total length. Pugnose Minnows prefer slow, clear water with sand bottoms and ample vegetation, and are often associated with riparian wetlands and nearshore areas (COSEWIC 2012). There are three or fewer known populations in Michigan.



- GOALS
- > Develop baseline of distribution and relative abundance.
 - > Develop a better understanding of critical life history characteristics and specific habitat needs.
 - > Increase awareness of Mudpuppies and their importance.



Mudpuppy
(Necturus maculosus)

The Mudpuppy is Michigan's largest salamander, reaching lengths up to 15 inches. They make squeaky vocalizations that sound like a dog's bark. Unlike other salamanders, the Mudpuppy is aquatic for the entirety of its life cycle and is easily identified by its external bushy reddish gills visible behind its head. Mudpuppies can be distinguished from other large salamanders by the presence of only four toes on their hind feet (Harding 1997). Mudpuppies are found throughout the state in rivers, inland lakes, and Great Lakes bays and shoal areas. Largely nocturnal, Mudpuppies are found under the cover of rocks and logs, or other suitable structures. Populations appear to be declining; anecdotal accounts suggest the species has become rare or absent in locations where it was once common in the 1970s and 1980s.



- GOALS
- > Develop baseline of distribution and relative abundance.
 - > Develop a better understanding of critical life history characteristics and habitat use.



Lake Sturgeon
(Acipenser fulvescens)
 State Threatened

The Lake Sturgeon is Michigan's largest fish species and is often referred to as a living fossil. Lake Sturgeon can exceed 6 feet in length and weigh over 200 pounds. Lake Sturgeon have five rows of bony plates along the body, a relatively long snout with four barbels, and a shark-like tail. During spawning season large Lake Sturgeon can be seen leaping and breaching the water surface. The preferred habitats for Lake Sturgeon include Great Lakes nearshore areas and large shallow lakes and rivers. Lake Sturgeon feed in shallows that provide abundant prey. Spawning habitats include gravel-cobble shoals and large rubble in rivers. Shallow waters with fine substrates are crucial nursery habitats. Throughout the Great Lakes basin Lake Sturgeon are at less than 1% of their historical abundance; however, many of these populations have retained genetic diversity (Welsh et al. 2010). Currently there are 24 Lake Sturgeon populations in Michigan. The Lake Sturgeon populations residing in the St. Clair-Detroit River System are considered large and stable and contain approximately 20,000 individuals (Hayes and Caroffino 2012).

GOALS

- > Refine population status and trends.
- > Maintain self-sustaining populations that allow for a recreational fishery throughout the St. Clair – Detroit River System.



HOW VULNERABLE ARE FOCAL SPECIES TO CLIMATE CHANGE?

Cooper et al. (in preparation) and Hoving et al. (2013) determined climate vulnerabilities for focal species. See threats section for more specifics about how climate change may affect species and habitats.

Climate vulnerability rankings are based on the likelihood and amount of change in species abundance or range by 2050 - extreme = extremely likely to substantially decrease or disappear; high = likely to significantly decrease; moderate = a modest decrease is likely.

| | Climate Vulnerability |
|-----------------|-----------------------|
| Lake Sturgeon | High |
| Mooneye | Moderate |
| Northern Madtom | Extreme |
| Pugnose Minnow | High |
| Mudpuppy | Moderate |



WHAT ARE THE CONSERVATION THREATS & ACTIONS?

Major threats that need to be addressed and key actions that need to be implemented over the next 10 years.



THREATS to Habitat

- > **Invasive & Other Problematic Species, Genes & Diseases**
 - Invasive plants and animals alter ecosystems and may out-compete native species.
- > **Natural Systems Modifications**
 - Dams in tributaries and shoreline armoring have resulted in loss of connectivity among habitats (Auer 1999; Carman 2001b; Derosier 2004; Hayes and Caroffino 2012).
 - Increased siltation and turbidity due to changes in land uses within the watershed (Trautman 1981; Smith 1985; Carman 2001b; Derosier 2004).
 - Dredging due to low lake levels results in loss of habitat.
- > **Residential & Commercial Development**
 - Shoreline development removes and simplifies habitat.
- > **Energy Production & Mining**
 - Experimental trials of kinetic hydropower systems have caused direct mortality and alteration of habitats.
- > **Transportation & Service Corridors**
 - Potential pollution from ruptured pipelines.
- > **Pollution**
 - Toxicants from historical discharges and recent accidental spills have contaminated sediments.
 - Contaminants of emerging concern, including microplastics and pharmaceuticals; effects are largely unknown (Pal et al. 2010).

- Increased nutrient loadings from point sources and non-point sources foster nuisance algal growth.
- > **Climate Change**
 - Climate change could have a variety of impacts: extreme lake level fluctuations could decrease available habitat, effects of changes in water temperatures on focal species are not fully understood (Pryor et al. 2014).

Conservation ACTIONS for Habitat

- > **Land & Water Management**
 - H1. Increase riparian complexity and connectivity through softened shorelines and by increasing native riparian vegetation. [LEBCS-6.4; SCDRS-11; SCRAOC; CRAOC; DRAOC; RRAOC]
 - H2. Increase wetland quantity and quality and shallow-water habitats. [DU; SCDRS-15; SCRAOC; CRAOC; DRAOC; RRAOC]
 - H3. Complete habitat improvement projects to remove Loss of Fish and Wildlife Habitat Beneficial Use Impairments identified in the Areas of Concern in the St. Clair – Detroit River System. [SCDRS-5; SCRAOC; CRAOC; DRAOC; RRAOC]
 - H4. Implement Michigan’s Aquatic and Terrestrial Invasive Species State Management Plans. [AIS; LEBCS-6.3; SCDRS-16, 17, 19, 20]

- H5. Increase continuous area of functional wetlands and their connectivity in the St. Clair – Detroit River System. [SCDRS-12]
- H6. Develop a list of priority sediment remediation projects required for Degradation of Benthos Beneficial Use Impairment removal in the Detroit River. [SCDRS-1; DRAOC]
- H7. Increase river spawning habitat. [SCDRS-13; LEBCS-6.6; SCRAOC; DRAOC]

> Raising Awareness

- H8. Develop and promote outreach and education materials for the St. Clair – Detroit River System that discuss the ecological and economic values this system provides, and habitat restoration efforts using Lake Sturgeon as an example species recovery story. [LEBCS-6.4; SCDRS-5]
- H9. Provide recreational users, researchers and industry with voluntary best management practices for stopping the introduction and spread of invasive species. [AIS; LEBCS-6.3; SCDRS; TIS]
- H10. Promote Great Lakes Aquatic Nonindigenous Species Information Network (GLANSIS); Clean Boats, Clean Waters Initiative; and, implement other strategies to prevent the establishment and spread of invasive species. [SCDRS-19, 20]
- H11. Support and promote best management practices to prevent losses of sediment and nutrients from agricultural lands. [LEBCS-6.2; SCDRS-6]

> Conservation Designation & Planning

- H12. Identify and protect critical habitat areas for rare species, including riverine and river mouth habitats. [SCDRS-14]
- H13. Prioritize dam removals in the St. Clair – Detroit River System. [LEBCS; RRAOC]
- H14. Continue to support and implement watershed management and green infrastructure plans in the watershed and other drainage areas adjacent to the St. Clair – Detroit River System. [SCDRS-6]

- H15. Conduct an inventory of shoreline condition, including islands, to prioritize protection and restoration efforts. [SCDRS-11-15]

- H16. Continue to characterize contaminated sediments and identify priority remediation sites in the St. Clair – Detroit River System. [SCDRS-1; DRAOC; RRAOC]

> Law & Policy

- H17. Support phosphorus reduction policies and other Domestic Action Plans identified under Annex 4 (Nutrients) of the Great Lakes Water Quality Agreement to reduce loading from regulated and unregulated sources of phosphorus. [SCDRS-6]
- H18. Take appropriate enforcement actions for violations of the Invasive Species Order, and maintain the Prohibited and Restricted Species list pursuant to the Natural Resources and Environmental Protection Act, 451 of 1994, as amended. [AIS]

> Research & Monitoring

- H19. Continue to expand the U.S. Geological Survey coastal wetland restoration assessment to aid in identifying priority sites. [LCC]
- H20. Complete and implement the U. S. Geological Survey coastal wetland functional assessment to provide both local and landscape assessments of coastal wetland restoration projects. [LCC]
- H21. Develop surveillance monitoring for aquatic invasive species. [SCDRS-16]
- H22. Identify contaminants of concern (e.g., pharmaceuticals, personal care products, microplastics), determine sources, and develop load reduction strategies. [SCDRS-7]
- H23. Conduct comprehensive aquatic plant community survey using the best available technology and compare with past survey efforts.
- H24. Use and promote the Midwest Invasive Species Information Network (MISIN) to monitor invasive species. [AIS; TIS]

THREATS to All Focal Species

- **Lack of Knowledge**
 - Lack of information on distribution, relative abundance, and limiting factors of focal species (Carman 2001a; Carman 2001b; Derosier 2004).
- **Natural Systems Modifications**
 - Removal of aquatic vegetation can degrade or remove crucial habitat for Pugnose Minnow (Carman 2001b).
 - Removal of rock, large woody material, and other suitable materials removes crucial habitat for Mudpuppies.
- **Transportation & Service Corridors**
 - Lake Sturgeon injuries and mortalities due to collisions with boats.
- **Biological Resource Use**
 - Poaching of Lake Sturgeon (Hayes and Caroffino 2012).
 - Human persecution; Mudpuppies are often an unwanted bycatch by ice anglers and are intentionally destroyed because they are falsely believed to compete with game fish species.
- **Pollution**
 - Bioaccumulation of contaminants may decrease viability of Lake Sturgeon eggs and reproduction (Hay-Chmielewski and Whelan 1997).
 - Degraded water quality in tributaries (Healy et al. 2008) potentially limiting distribution of focal species (Carmen 2001a; Carmen 2001b).
 - Lampricides contribute to mortality of focal species (Hayes and Caroffino 2012).

Conservation ACTIONS for All Focal Species

- **Species Management**
 - S1. Focal species are present in waters shared by the United States and Canada. Conservation efforts should be coordinated and implemented through existing collaborative groups such as the St. Clair-Detroit River System Initiative and Great Lakes Fishery Commission's Lake and Technical Committees.
 - S2. Continue to implement Michigan's Lake Sturgeon rehabilitation strategy. ^[LS]
 - S3. Continue to work with the Ontario Ministry of Natural Resources on Lake Sturgeon recovery efforts. ^[LS]
 - S4. Continue installation of Lake Sturgeon spawning reefs and monitor their use. ^[LS; SCDRS-5,13; SCRAOC]
 - S5. Establish a target population goal for Lake Sturgeon specific to the St. Clair – Detroit River System.
- **Raising Awareness**
 - S6. Develop and promote outreach and education to anglers about the values of Mudpuppy.
 - S7. Promote and use Michigan's Herp Atlas website and application (www.miherpatlas.org/).
 - S8. Promote and implement appropriate best management practices detailed in the Habitat Management Guidelines for the Amphibians and Reptiles of the Midwestern United States (Kingsbury and Gibson 2012).

S9. Promote focal species at Detroit River Days, Sturgeon Festivals, and other events in the region.

➤ Conservation Designation & Planning

S10. Develop a Mudpuppy Conservation Plan for the St. Clair – Detroit River System.

S11. Develop a conservation plan for Northern Madtom for Michigan. [SCDRS-14]

➤ Research & Monitoring

S12. Identify and protect critical habitat areas for rare species, including riverine and river mouth habitats. [LS; LEBCS; SCDRS-14]

S13. Gather more information about early life history and spawning requirements for focal species.

S14. Determine most effective sampling methods for all life stages of the Northern Madtom, Pugnose Minnow, and Mooneye. [SCDRS-14]

S15. Update distribution maps for Northern Madtom, Pugnose Minnow, and Mooneye with existing information collected by conservation partners. [SCDRS-14]

S16. Continue contributing Lake Sturgeon samples to the genetic archival program managed by the Canadian Department of Fisheries and Oceans. [LS]

S17. Determine Lake Sturgeon juvenile habitats and locations. [LS; SCDRS-14]

S18. Determine Lake Sturgeon population and meta-population structure and sizes. [SCDRS-14]

S19. Determine feasibility of reestablishing tributary spawning populations of Lake Sturgeon in the Clinton River. [LS; SCDRS-14]

S20. Determine focal species use of tributaries and the effects of dams and barriers. [LEBCS-6.6; SCDRS-14]

S21. Use information gathered in hydropower pilot projects to determine potential effects of future projects on focal species and their habitats.





HOW WILL WE MONITOR?

Assessing status and measuring progress towards goals.



HABITAT

- Inventory areas of significant sediment contamination in the Detroit River and prioritize sites for remediation. [SCDRS-1; DRAOC]
- Continue Great Lakes Coastal Monitoring Project to provide data on shoreline habitat quality. [LEBCS; SCDRS]



NORTHERN MADTOM, MOONEYE & PUGNOSE MINNOW

- Continue Michigan Department of Natural Resources Northern Madtom minnow trap surveys. [SCDRS-14]
- Continue U.S. Geological Survey juvenile fish seining surveys. [SCDRS-14]
- Conduct targeted surveys to determine distribution and relative abundance.



MUDPUPPY

- Conduct targeted survey to determine distribution and relative abundance.
- Use citizen science programs, such as the Herp Atlas, to help assess distribution and relative abundance.

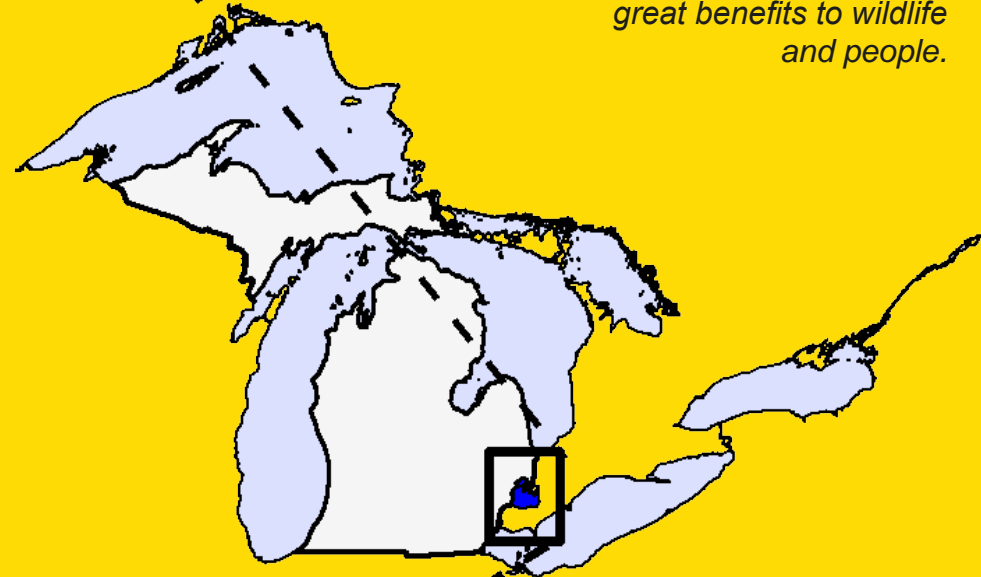
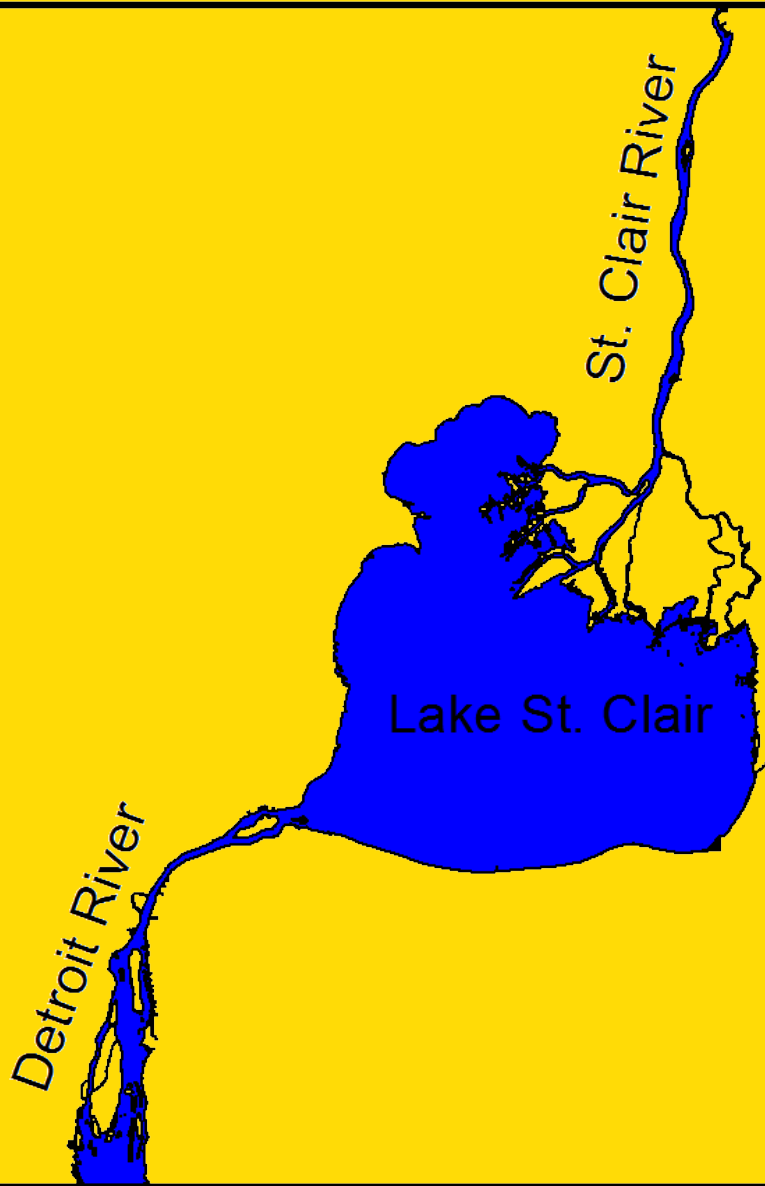


LAKE STURGEON

- Continue annual Lake Sturgeon surveys of all life stages conducted by U.S. Fish and Wildlife Service, U.S. Geological Survey, and Michigan Department of Natural Resources. [LS; SCDRS-14]

WHERE ARE THERE PLACES FOR PARTNERSHIP?

This map was designed by partners to help them connect around important places for focal species. Working together on conservation actions on a voluntary basis provides great benefits to wildlife and people.



This map is based on partner priorities.



HOW DOES THIS PLAN LINK WITH OTHER CONSERVATION PLANS?

There has been a multitude of relevant planning efforts across the state and country over the past ten years. Bracketed superscripts throughout the Wildlife Action Plan indicate where the conservation action, goal, or monitoring strategy aligns with those from another plan. For conservation plans with distinct objectives, the objective or strategy number is also included. This linking of plans is meant to facilitate the expansion of partnerships.

[ACE] St. Clair River and Lake St. Clair comprehensive management plan June 2004 (USACE 2004)

[AIS] Michigan's aquatic invasive species state management plan 2013 Update (MDEQ et al. 2013)

[LEBCS] Returning to a healthy lake: Lake Erie biodiversity conservation strategy: technical report (Pearsall et al. 2012)

[CRAOC] Clinton River Area of Concern - delisting targets for fish/wildlife habitat & population beneficial use impairments for the Clinton River Area of Concern (ECT 2009)

[DRAOC] Detroit River Area of Concern – delisting targets for removal of the loss of fish & wildlife habitat and degradation of fish & wildlife populations beneficial use impairments of the Detroit River Area of Concern (DRPAC 2014)

[DU] Ducks Unlimited: Great Lakes Initiative

[LCC] Upper Midwest and Great Lakes Landscape Conservation Cooperative: Coastal Conservation Focal Area

[LS] Michigan's lake sturgeon rehabilitation strategy (Hayes and Caroffino 2012)

[RRAOC] Rouge River Area of Concern - delisting targets for fish & wildlife habitat & population beneficial use impairments for the Rouge River Area of Concern (ECT 2008)

[SCDRS] Selected priority objectives for the St. Clair Detroit River System Initiative (SCDRS 2015)

[SCRAOC] St. Clair River Area of Concern delisting targets for loss of fish/wildlife habitat beneficial use impairment of the St. Clair River Area of Concern (ECT 2012)

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ABOUT THE WILDLIFE ACTION PLAN

Today's Priorities, Tomorrow's Wildlife

Every state has a Wildlife Action Plan, which taken together create a national conservation strategy for safeguarding wildlife and their habitats for current and future generations. Each state's action plan is uniquely designed to serve the needs of that state. These plans provide a framework for proactive conservation and management of fish and wildlife before they become imperiled, which is more straightforward, cost-efficient, and effective.

Michigan's Wildlife Action Plan was developed by conservation partners across the state. It provides information about those species in greatest conservation need. The plan is organized by chapters or mini-plans. Each mini-plan outlines priorities for the next 10 years. The mini-plans detail priority habitats and focal species of greatest conservation need, status of species and habitats, critical threats, needed conservation actions, places for partnerships, monitoring needs, and goals. This is one of 15 mini-plans. For more information about how the plan was built and to read other mini-plans, please visit: www.michigan.gov/dnrwildlifeactionplan.