

Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin

## At-Risk Riverine Fishes: Paddlefish and Lake Sturgeon

### Problems

Paddlefish and lake sturgeon were common components of fish communities in the large rivers of the Mississippi River drainage before 1900. Overharvest and human alteration of rivers have resulted in significant declines in paddlefish and lake sturgeon populations. Construction of dams on rivers has especially affected these species by altering traditional river habitats and disrupting spawning migrations. Paddlefish have been extirpated from four states and Canada. Eleven of 22 states within what remains of its range now list the paddlefish as endangered, threatened, or a species of special concern. Similarly, lake sturgeon is listed as a species of special concern throughout most of its native range.



Aerial photo of Lock and Dam 5 near Winona, Minnesota. The locks and dams on the Upper Mississippi River can impede upstream movements of these large fishes.



We captured lake sturgeon and paddlefish with gill and hoop nets for the telemetry studies.

### Solutions

Restoration efforts for these species require knowledge of the factors that are negatively affecting their populations. To identify these factors, the Upper Midwest Environmental Sciences Center, in collaboration with the U.S. Fish and Wildlife Service, conducted telemetry studies in which we surgically implanted radio transmitters into captured fish in the Mississippi, Wisconsin, and Chippewa Rivers. Then we tracked individual paddlefish and lake sturgeon to determine important features and availability of their habitats, delineate the appropriate

scales for managing stocks, assess the role of dams in impeding migrations and fragmenting populations, and evaluate fish responses to commercial traffic. These telemetry studies provide substantial new insights into the effects of navigation and river modifications on these special species.



Center scientists tracked radio-tagged paddlefish in the Upper Mississippi River.



Center biologist measures dissolved oxygen at a fish location.

Mississippi River (50% or more of the tagged fish each year spend at least one month in the Mississippi River), whereas Wisconsin River paddlefish rarely enter the Mississippi River.

- The low-head navigation dams in the Upper Mississippi River appear to function as intermittent barriers to paddlefish movement. Upstream passage of fish through dams typically occurs only during floods when dam gates are completely raised out of the water.
- Our study shows that areas with a combination of low flow velocities and deep water (usually deeper than 6 m) are important habitat for paddlefish in the Upper Mississippi River. Such habitat is susceptible to sedimentation and may be in decline.

## Research Findings to Date

### Lake Sturgeon

- Individual lake sturgeon are often found in small, core areas that contain silt or silt-sand substrates and moderate flow. These areas likely provide high densities of common prey of lake sturgeon.
- Lake sturgeon are highly mobile. Individual lake sturgeon occasionally leave their core area with movements up to 120 miles, but generally return after being absent for a few weeks to months.
- Lake sturgeon tagged in the Upper Mississippi River made extensive use of the Wisconsin River, a tributary to Pool 10 south of Prairie du Chien, Wisconsin. This indicates that the population transcends regulatory boundaries. For example, two female lake sturgeon with eggs were tagged in Pool 10 where they are protected, but were later harvested in the Wisconsin River during the fall fishing season.
- Lake sturgeon extensively use main channel and channel border areas in the Upper Mississippi River, indicating a high potential for encounters between lake sturgeon and commercial barge traffic. Individual lake sturgeon respond differently to barge passage; some appear to be forced out of the main channel, whereas others remain in the main channel, risking being struck by towboat propellers.

### Paddlefish

- Paddlefish in the Upper Mississippi, Chippewa, and Wisconsin Rivers may be a single genetic stock given that that some individual paddlefish moved between all of these rivers.
- The paddlefish population in the Chippewa River is strongly connected to the main stem of the

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Center scientists hold a paddlefish captured and released in the study.