

## Project Highlight – SD State Wildlife Grant

**Project Type**        Research

**Title**    Development and application of a habitat assessment tool for juvenile Pallid Sturgeon in the upper Missouri River

**In a nutshell**        The Pallid Sturgeon is a long-lived, bottom-dwelling species that inhabits areas with strong currents and firm sand bottoms of large, turbid rivers. The loss of riverine habitats has caused a lack of natural reproduction. Recent recovery efforts have included hatchery propagation and reintroduction. This study was designed to provide a better understanding of the habitat needs and food habits of juvenile Pallids in the Missouri River.

### **Relevant Species of Greatest Conservation Need**

- Pallid Sturgeon (*Scaphirhynchus albus*)

**Relevant Habitats**    remaining “natural” stretches of lower Missouri River

**Cooperators**        SD Cooperative Fish and Wildlife Research Unit, SDSU (Dr. Steve Chipps and graduate students Brian Spindler and Kristen {Berg} Grohs)

### **Purpose**

- develop and evaluate a juvenile Pallid Sturgeon bioenergetics model
- quantify effects of water temperature, turbidity and water velocity on feeding rate of juvenile Pallid Sturgeon
- model habitat suitability for juvenile Pallid Sturgeon in the Missouri River
- quantify prey selectivity of age-0 Pallid Sturgeon

**Timeframe**    2005 - 2008

**Location**        lower Missouri River in South Dakota

### **Summary or Important Findings**

- A bioenergetics model was developed to estimate feeding and growth rates of juvenile Pallid Sturgeon to help assess fish growth, habitat suitability, and issues related to captive propagation of this species.
- Young Pallids relied on invertebrates and fish prey, while fish prey was important for growth of larger juveniles.
- Sampling below Fort Randall Dam indicated that macroinvertebrates are important diet items for juvenile Pallid Sturgeon, rather than fish.
- Field evaluations in the Missouri River’s Fort Randall Reach helped describe preferred habitats of juvenile Pallids, which will assist in predicting habitat potential.
- Capture of Pallids was influenced by presence of deeper water, sandy substrates and prey availability.

**Best contact person**      Dr. Steve Chipps, South Dakota State University

**More Information**

- Spindler, B.D. 2008. Modeling spatial distribution and habitat associations for juvenile pallid sturgeon (*Scaphirhynchus albus*) in the Missouri River. M.S Thesis, South Dakota State University, Brookings.
- Grohs, K.L. 2008. Macroinvertebrate composition and patterns of prey use by juvenile pallid sturgeon (*Scaphirhynchus albus*) in the Missouri River, South Dakota and Nebraska. M.S. Thesis, South Dakota State University, Brookings.
- Chipps, S.R., R.A. Klumb and E.B. Wright. 2008. Development and Application of Juvenile Pallid Sturgeon Bioenergetics Model. Final Report, State Wildlife Grant Program, Study T-24-R Study No. 2424. Submitted to South Dakota Department of Game, Fish and Parks, Pierre, SD.

Scientific publications resulting from this project:

- Grohs, K. L., R. A. Klumb, S. R. Chipps and G. A. Wanner. 2009. Ontogenetic patterns in prey use by pallid sturgeon in the Missouri River, South Dakota and Nebraska. J. Appl. Ichthyol. 25: 48-53.
- Spindler, B. D., S. R. Chipps, R. A. Klumb and M. C. Wimberly. 2009. Spatial analysis of pallid sturgeon *Scaphirhynchus albus* distribution in the Missouri River, South Dakota. J. Appl. Ichthyol. 25: 8-13.
- French, W. E., B. D. S. Graeb, S. R. Chipps, K. N. Bertrand, T. M. Selch and R. A. Klumb. 2010. Vulnerability of age-0 pallid sturgeon *Scaphirhynchus albus* to fish predation, J. Appl. Ichthyol. 26: 6-10.
- Spindler, B.D., S.R. Chipps, R.A. Klumb, B.D.S. Graeb, and M.C. Wimberly. 2012. Habitat and prey availability attributes associated with juvenile and early adult pallid sturgeon occurrence in the Missouri River, USA. Endangered Species Research Vol. 16: 225-234.