

# Activities

November 2009

South Dakota Cooperative Fish and Wildlife Research Unit  
South Dakota State University  
Box 2140B, Northern Plains Biostress Laboratory 138  
Brookings, SD 57007-1696  
Telephone: 605-688-4777  
Fax: 605-688-4515  
Email: [charles.berry@sdstate.edu](mailto:charles.berry@sdstate.edu)



***Happy Holidays  
from the  
South Dakota  
Cooperative Fish  
and Wildlife  
Research Unit***

## Research Highlight

**Research Need:** Vulnerability of pallid sturgeon to fish predation.

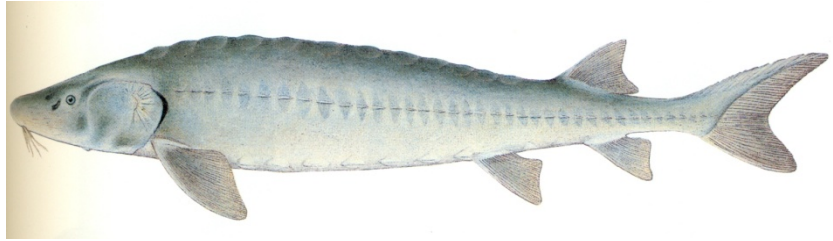
**Research Finding:** The vulnerability of age-0 pallid sturgeon (< 4 inches long) to predation by channel catfish and smallmouth bass is low, especially in the presence of an alternative fish prey. Age-0 pallids and fathead minnows were offered to channel catfish and smallmouth bass in laboratory experiments. Neither predator selected the small pallid sturgeon when the fathead minnows were available across all prey density combinations. When pallid sturgeon were the

only prey item, smallmouth bass consumed more pallids (about one fish/hour) than did channel catfish. Water velocity of 0.0 m/s and 0.15 m/sec did not influence results. Managers wish to stock pallids at small sizes to alleviate high densities of fish at hatcheries, but little is known about vulnerability of small pallid sturgeon to fish predation. Managers should stock pallids in areas of low predator abundance and high buffer prey species abundance.

## Research Accomplishments

### Lake Sturgeon Reproduction:

Assistant Unit Leader Dr. Steven R. Chipps and Stephanie Shaw (M.S. Graduate Research Assistant (GRA)) met with Dr. Molly Webb (U.S. Fish and Wildlife



Service (FWS)-Bozeman Fish Technology Center) to discuss lake sturgeon reproductive markers. Chipps is collaborating with Dr. Webb on a National Park Service study to identify spawning locations and reproductive structure of lake sturgeon.

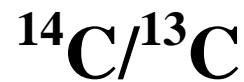


Topeka Shiner Found in Experimental Dugout: Two dugouts were excavated in a South Dakota State University (SDSU) pasture beside Six Mile Creek in 2005 as part of a now completed study on fishes of floodplain dugouts. Thirteen fish species have immigrated into the dugout during flooding of a

secondary channel that temporarily connects the dugout to the stream (right dugout in aerial photo with Six Mile Creek in upper part of photo). This fall (11/6) was the first time we found a Topeka shiner in the dugout.

Pallid Sturgeon Diet Shift: Stable isotope data and diet data showed similar patterns – pallid sturgeon shifted from invertebrates to fish prey at about 600 mm fork length. Chipps is collaborating with SDSU Professors Brian Graeb and Katie Bertrand and FWS Biologist Rob Klumb on the isotope study.

What is stable isotope analysis? The elements (e.g., C, N, H, O, S) all have more than one isotope, which are based on atomic weight (number of protons and neutrons as in  $^{12}\text{C}$ ,  $^{13}\text{C}$  for carbon). A mass spectrophotometer is used to measure isotopes. The kinds and ratios of



isotopes differ depending on the region of the world. This chemical “fingerprint” can be used to determine the source of animal (e.g., poached ivory) and agriculture (e.g., carpets) products. Archeologists use isotopes to determine if a skeleton in a burial ground was a resident or an immigrant and what kind of food they ate. Kinds and ratios of isotopes also differ with biological processes when isotopes are metabolized by plants and passed up trophic levels. *A fish is what it eats* so its muscle nitrogen ( $^{15}\text{N}/^{14}\text{N}$ ) ratio reflects its diet of plant and animal life. Stable isotopes

do not change (are stable) unless they are processed (fractionated). One isotope of carbon ( $^{14}\text{C}$ ) is not stable – it decays through time. A spectrophotometer analysis of the  $^{14}\text{C}/^{13}\text{C}$  ratio is used in radiocarbon dating. The Coop Unit is participating in a nationwide isotope study of water to determine historical climate information from groundwater. Chipps' students have used stable isotopes to determine diet information for Lake Oahe walleye (see 2003 thesis by Blake Davis on the Departments web page <http://wfs.sdstate.edu/wfsdept/Theses%20and%20Dissertations.htm>). Chipps' research team has determined that non-lethal fin clips can be used for stable isotope testing.

## Technical Assistance

To SDSU: Chipps served on Melissa Wuellner's Ph.D. committee. Melissa successfully defended her dissertation titled "Determining whether competitive interactions exist between walleye and smallmouth bass in South Dakota waters."

To South Dakota Department of Transportation (DOT): Unit Leader Dr. Charles R. Berry, Jr., and GRA Luc Borgstrom hosted a mini-workshop on fish identification for DOT Biologists Ruth Powell and Ryan Hubert on November 16. We sampled Six-Mile Creek and adjacent dugouts and viewed the Unit's fish collection; emphasis was on cyprinids and Topeka shiners.

To SDSU: Berry and Chipps presented two guest lectures in the undergraduate course --- Introduction to Wildlife and Fisheries Management (WL 220). Chipps on aquatic habitat management; Berry on aquatic habitat types.

To University of Arkansas at Pine Bluff (UAPB): Chipps presented a guest lecture on fish bioenergetics for a graduate level course in fish physiology at UAPB. The lecture was presented using Elluminate – a web-based video conferencing system available at most Universities.

To Lakehead University: Chipps serves as a committee member and adjunct faculty member for Cam Trembath at Lakehead University.

To Southern Illinois University (SIU): Chipps serves as a committee member and adjunct faculty for Bill Hintz, Ph.D. student at SIU.

To American Fisheries Society (AFS): Chipps served as a peer-reviewer for North American Journal of Fisheries Management.

To Society of Wetland Scientists: Chipps served as a peer-reviewer and Associate Editor for Wetlands.

To SDSU – Water Resources Institute: Berry served on the organizing committee for the South Dakota Water Conference, co-presented a luncheon talk with Dr. Katie Bertrand, and hosted a display table for Year of Science.



To Brookings Wildlife Federation (BWF): Berry represented the BWF at the Buffalo Banquet (November 20) and presented the BWF scholarship award to David Trimpe from Anthon, Iowa. Dave is a Sophomore/Junior majoring in fish and wildlife science.

## Publications and Award

Berry, C. November 2, 2009. 2009: The Year of Science and public understanding of science. Presented at the 2009 Eastern South Dakota Water Conference, Brookings.

Berry, C. 2009. Five Steps for Citizen Scientists. South Dakota Wildlife Federation Out-of-Doors 49(11):1,3.

Hanan, M. D. 2009. Land cover change and the breeding bird survey: rates of change in relation to roads. M.S. thesis, South Dakota State University (this study funded through the Unit to Dr. K. C. Jensen by Research Work Order 102).

McCutcheon, C., L. Stetler, J. Stone, and S. Chipps. November 2, 2009. Relations between water quality and mercury fish tissue concentrations for natural lakes and impoundments in South Dakota. Presented at the 2009 Eastern South Dakota Water Conference, Brookings.

Award: Berry received a plaque commemorating 25 years of service to the Department of Wildlife and Fisheries Sciences; presented by Dr. David Willis at the 61<sup>st</sup> Buffalo Banquet.

## Other

Carol Jacobson has joined the South Dakota Coop Unit as our half-time administrative assistant. Carol has considerable experience with both University and federal-related activities and will be assisting with a variety of Coop Unit-related activities. She can be contacted at 605-688-4777 or [carol.jacobson@sdstate.edu](mailto:carol.jacobson@sdstate.edu).

The Department has gone high tech with an automated answering system – 605-688-6121. To contact Unit staff after accessing the automated system dial 2 for Chipps and 1 for Berry.

Chipps attended the Midwest regional CRU meeting in Nebraska City, Nebraska. Coop Unit scientists from IA, OK, MO, SD, KS, NE, and CO met to discuss regional research and develop collaborative efforts to address state research needs. One outcome of the meeting was to develop a multi-state proposal aimed at addressing non-game monitoring and research needs across state boundaries.