2009

2009 NEBRASKA GAME AND PARKS COMMISSION BROODSTOCK COLLECTION

Kirk Steffensen

Jeff Koch

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Pallid Sturgeon Recovery Efforts

The Nebraska Game and Parks Commission (NGPC) organized the second intensive effort targeted towards sampling pallid sturgeon in reproductive condition in the upper channelized Missouri River. Volunteers were solicited from area universities, colleges, and state and federal agencies to assist Game and Parks personnel from Monday, April 6 through Saturday, April 18 (excluding Easter weekend).

Josh White (NGPC-Wildlife Division) displays an adult pallid sturgeon that was captured just below the Hamburg, IA boat ramp.

Sampling crews targeted areas around the confluence of the Platte and Missouri Rivers (River Mile [RM] 595.0) to Peru, NE (RM 542.0). With the additional help from volunteers, crews were able to span a total of 43 river miles and sample 25 different river bends.

Sampling was conducted using 200-foot trotlines with 40 hooks per line baited with worms. Similar to previous efforts, trotlines were a valuable gear in the collection of pallid sturgeon broodstock. Overall, trotlines collected a total of 160 pallid sturgeon in 15 days of sampling, while traditional sampling gears (i.e., gill nets) were excluded from this year's intensive effort due to variable catches and the large amount of effort associated with using these gears.

Background

Pallid sturgeon are native to the Missouri and Mississippi River systems. Due to population declines, the species was listed as federally endangered in 1990. Human alterations to the river such as the creation of dams, destruction or alteration of spawning areas, reduction of food sources, alterations to water temperature and turbidity, and changes to the natural hydrograph have likely been the driving forces behind these declines. Several recovery projects have been initiated to monitor the current population status of pallid sturgeon and other native river species, evaluate changes in habitat alterations/improvements, and to identify and understand various life history characteristics of pallid sturgeon, particularly reproductive behaviors. In addition to these recovery projects, a stocking program was developed to ensure the persistence of the species until pallid sturgeon reproduce naturally and are self-sustaining. Since recovery projects began in the early 2000's, very few adult pallid sturgeon in reproductive condition have been captured in the Middle Basin. As such, until 2007, the Middle Basin relied on the availability of Upper Basin progeny to stock into the river below Gavins Point Dam. During the spring of 2007 and 2008, NGPC initiated focused efforts to collect adult broodstock from the Middle Basin for the stocking program. In both years, these efforts resulted in the capture of adult male and female pallid sturgeon that were successfully spawned in hatchery facilities. These two year classes represent the first progeny of Middle Basin origin that have been stocked into the Missouri River.

Shovelnose (left) and Pallid (right) sturgeon

Nebraska Game and Parks Biologist Tim Porter poses with a reproductive female pallid sturgeon captured near Plattsmouth, NE.

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Total Pallid Sturgeon Captures

A total of 160 pallid sturgeon were collected during the 2009 Intensive broodstock collection efforts (Figure 1). Prior to the intensive effort, NGPC captured and transported 22 adult pallid sturgeon to Gavins Point National Fish Hatchery in Yankton, SD while completing their standardized sampling using gill nets and trot lines. Twenty-three of the 160 pallid sturgeon collected during the intensive effort were transported to Blind Pony State Fish Hatchery for evaluation of their sex and reproductive condition. Additionally, 110 known hatchery-reared and 27 pallid sturgeon of unknown origin were collected.

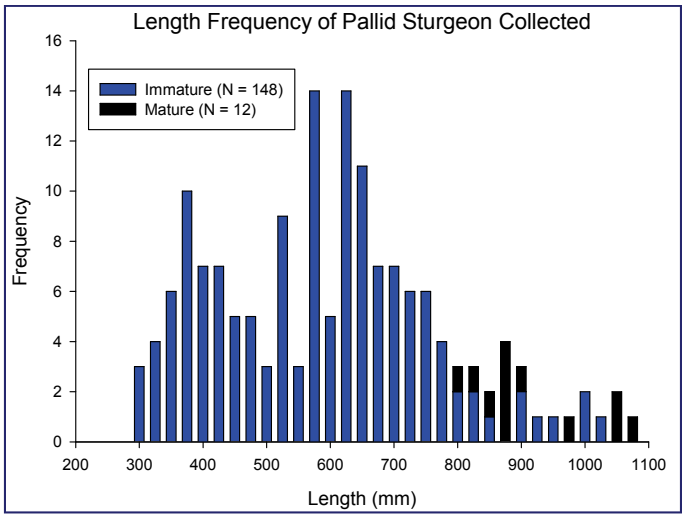

Figure 1. Number of pallid sturgeon caught per 25-mm length group during broodstock collection efforts.

Sex & Stage Determination

Upon arrival at the hatchery, brookstock fish were placed in large circular tanks until a reproductive diagnosis could be conducted. On several occasions, Janice Bryan of the United States Geological Survey-Columbia, MO (USGS) visited the hatcheries to determine sex and reproductive stage of pallid sturgeon that had been transported. At Gavins Point National Fish Hatchery, six male and one female pallid sturgeon are in reproductive condition and will be spawned this year. Three reproductive females and six reproductive males were transported to Blind Pony State Fish Hatchery are also ready to spawn this year. All fish that will not be used as current or future broodstock were released back into the river near their capture sites.

Adam Hemer (ISU) holds a mature male pallid sturgeon prior to being transported to Blind Pony State Fish Hatchery.

Hatchery Recapture Data

With information gathered from tags in recaptured pallid sturgeon, 63 of the 110 known hatchery-reared pallid sturgeon could be traced back to their hatchery, stocking site, and year class origin. Fish raised at Garrison National Fish Hatchery (N=36) represented 57% of the total catch followed by Gavins Point National Fish Hatchery (N=24), and Neosho National Fish Hatchery (N=3). Four fish that were collected had passed through Gavins Point Dam and were captured near the Platte River and Hamburg, IA. The majority of hatchery-raised fish were stocked at Boonville, MO (RM 195.1; N=17), Bellevue, NE (RM 604.1; N=15), and the mouth of the Platte River, NE (RM 595.0; N=13). The largest downstream movement of a stocked pallid sturgeon was 291 miles from Niobrara, NE (RM 845) to Hamburg, IA (RM 554). The largest upstream movement was 398 miles from Boonville, MO (RM 195) to Plattsmouth, NE (RM 593). Recaptured pallid sturgeon of hatchery origin had been at-large for an average of 4.6 years. The shortest time at-large of any recaptured hatchery-reared pallid sturgeon was 388 days, while one pallid sturgeon was recaptured after seven years at large. The 2002 year class was the most represented year class with 22 individuals, followed by the 2007 and 2001 year classes (N=13). A notable recapture came from a fish stocked in Boyer Chute during the reenactment of the Lewis and Clark voyage in 2004. There were only 51 fish stocked during this event.

Larry Maresh holds a pallid sturgeon collected a few miles below the confluence of the Platte and Missouri rivers.

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Sampling Effort

A total of 70 volunteers, representing 7 universities, 4 government agencies, 2 non-government agencies, and 4 private entities worked a total of 109 days. There were 15 NGPC Missouri River Program employees that lead this effort and worked a total of 146 days. With all help combined, 255 days of effort was exerted in an 11-day span. Daily efforts varied depending on the number of volunteers; however, four or five boats fished daily from Monday, April 6 through Saturday, April 18 (excluding Easter weekend). A total of 424 trotlines were deployed resulting in 16,939 hook nights. Trotlines were surprisingly specific to sturgeon species, as sturgeons comprised 3,622 of 3,982 total fish sampled (91%) . Prior to targeted broodstock efforts, trot lines had limited use on the Missouri River. This gear has proven to be effective and will likely continue to play a large role in future pallid sturgeon sampling efforts.

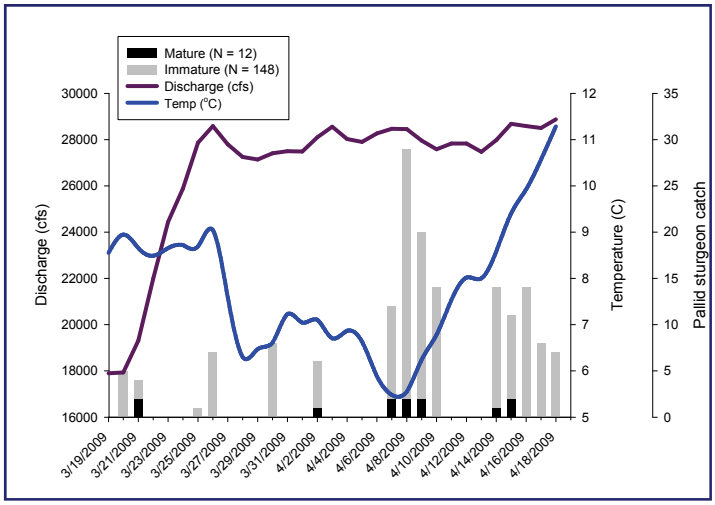

Figure 2. River discharge, gage height, and temperature from 3/19/2009 through 4/18/2009 at Nebraska City, NE.

In addition to the 11-day intensive effort, NGPC crews collected 22 pallid sturgeon during additional standard sampling in the fall of 2008 and the spring of 2009. During these periods, pallid sturgeon were collected using multifilament experimental gill nets and trot lines.

During the intensive effort, pallid sturgeon (hatchery-reared or wild origin) were collected everyday that crews sampled. In addition, adult pallid sturgeon (>750 mm) were transported to a hatchery for a reproductive diagnosis everyday but two. Catch rates of pallid sturgeon varied throughout the 11-day period; although the highest catches were correlated with the lowest water temperatures (Figure 2). Unlike 2008, there was no dramatic increase in flow during this year's intensive effort. Last year, an increase in flows appeared to relate to an increased catch of pallid sturgeon.

Sampling gears were deployed in a variety of habitat types and catch rates varied between areas. This indicates that sampling success may have been more related to activity levels of pallid sturgeon rather than targeting particular habitat types. During this effort, crews fished water temperatures ranging from 5.5 to 11.3°C. In addition, discharge increased approximately 11,000 cubic-feet per second during standard sampling in late-March; however, during the intensive effort, discharge was fairly stable. Weather conditions were less than ideal on several days and exhibited extreme fluctuations in temperature and precipitation. Due to blizzard conditions on Sunday, April 5, fish collection was cancelled; however, the following day, trot lines were deployed while temperatures dipped into the low 30's and winds gusted to 40 mph. In contrast, the high temperature of 70°F was recorded on Saturday, April 18th, after thunderstorms had moved through the sampling area.

Blake Smith (NGPC) shows his first broodstock pallid sturgeon.

Dr. Mark Pegg of UNL shows his devotion to pallid sturgeon recovery.

Luke Kowalewski (NGPC) and Wes Bouska (KSU) show off two lake sturgeon caught on Tobacco Bend (RM 589.0).

PARTCIPANTS & VOLUNTEERS

Adam Hemer (ISU)
Andrew Veech (NPS)
Baxter Poe (PSC)
Ben Ream (USACE)
Bill Garvey (NGPC)
Blake Smith (NGPC)
Bobbi Adams (SDSU)
Brandon Eder (NGPC)
Brian Bissell (SDSU)
Brian Cecava (Ameritas)
Cal Borden (UNL)
Cameron Goble (NGPC)
Christian Luedtke
Clinton Helms (FHSU)
Dale Young
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Dan Wiley (NPS)
Dane Pauly (ISU)
Darren Thornbrugh (NGPC)
Dave Guittar
(Fishin' Freddie's)
David Crane (USACE)
Denise Nelson (NPS)
Derik Lape (NGPC)
Erik Prenosil (PSC)
Frank Albrecht (NGPC)
Gerald Mestl (NGPC)
Gibran Suleiman (USFWS)
Greg Cecava (State Farm)
Jacob Thompson (UNO)
Jared Stirling (USACE)
Jason Luebbe (NGPC)
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Jeff Blaser (NGPC)
Jeff Gilson
Jeff Koch (NGPC)
Jennifer Davis (USACE)
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Jerry Smith
Jim Brannen (NGPC)
John Hargrave (USACE)
Jordan Mejstrik
Josh White (NGPC)
Josh Wilhelm (NGPC)
Ken Hatten (NGPC)
Kirk Steffensen (NGPC)
Lana Gilson (Arbor Day Farm)
Larry Maresh
Lonny Zwickle (USPS)
Lourdes Mena (USFWS)
Luke Kowalewski (NGPC)
Maria Dzul (ISU)
Marilyn Tabor (NGPC)
Mark Pegg (UNL)
Matt Gruntorad (UNL)
Matt Hollman (NGPC)
Matt Schwarz (USFWS)
Megan Thul (ISU)
Mick Sandine (USACE)
Mike Archer (NGPC)
Mike Gilbert (USACE)
Mitch O'Reilly (KSU)
Nathan Busche (USACE)
Neal Bedlan (NPS)
Neil Bass (USACE)
Nicole Shorney (USACE)
Nikki Lorenz (SDSU)
Pat Arkfeld
Phil Stolberg (UNL)
Randy Stutheit (NGPC)
Ron Beyer (USACE)
Russ Somsen (USACE)
Sarah Tomlin (PSC)
Schuyler Sampson (NGPC)
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Tanner Stevens (UNL)
Teeg Stouffer
(RecyledFish.org)
Tim Porter (NGPC)
Tim Welker (USACE)
Tom Curran (USACE)
Tony Korth (NGPC)
Travis Kopf (NGPC)
Trevor Munkvold (USACE)
Wes Bouska (KSU)
Weston Fleming (FHSU)

SAMPLING FACTS

- 160 - Total number of pallid sturgeon collected during intensive effort
- 45 - Number of pallid sturgeon send to the hatchery for evaluation
- 16 - Number of pallid sturgeon in reproductive condition (4 females and 12 males)
- 1,075 mm and 5,450 g - Largest pallid sturgeon collected
- 2 - Total number of lake sturgeon collected
- 2 - Total number of pallid x shovelnose hybrids collected
- 3,460 - Total number of shovelnose sturgeon collected
- 4,729 lbs of shovelnose sturgeon collected
- 3,982 - Total number of fish collected
- 16.1 miles of trot lines deployed
- 17,000 - Approximate number of night crawlers used during this effort
- 8,500 ft - Length on all the night crawlers used if laid end to end
- 7,062 - Total number of miles driven by sampling crews
- 2,350 - Total number of miles driven by NGPC tank trucks
- 30°F - Coldest day
- 45 mph - Highest recorded wind speed
- 70 - Total number of volunteers (57 males and 13 females)
- 668 miles - Longest round trip distance traveled by a volunteer (Clinton Helms and Weston Fleming - Fort Hays State University)
- 5 - Most days worked by one volunteer (Tanner Stevens - University of Nebraska Lincoln)
- 2,423 - hours of work expended by volunteers and NGPC personnel.