

## 2010 NEBRASKA GAME AND PARKS COMMISSION BROODSTOCK COLLECTION

### Pallid Sturgeon Recovery Efforts

JIM BRANNEN & JOSH WILHELM

The Nebraska Game and Parks Commission (NGPC) organized the third 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 NGPC personnel from Monday, April 5 through Friday, April 16, 2010.

Sampling crews targeted an area from the confluence of the Platte and Missouri Rivers (River Mile [RM] 595.0) to Lower Barney Bend below Hamburg, IA (RM 546.2). Crews were able to fish a total of nearly 53 river miles and sample 16 different river bends because of the additional help from volunteers.

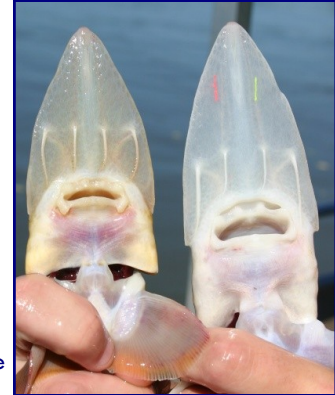
Sampling was conducted using gill nets and 200-foot trotlines with 40 hooks per line baited with worms. Due to high water levels prior to the intensive effort five bends were sampled with gill nets, in addition to trotlines to fulfill standardized sampling commitments. A total of 7 pallid sturgeon were sampled using this gear. Overall, trotlines collected a total of 160 pallid sturgeon in 12 days of sampling.



Grant and Easton display two hatchery pallid sturgeon sampled on a trotline near Nebraska City with their father Frank Albrecht (NGPC).

### 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. The construction of the mainstem dams and navigation channel has drastically modified the river from its natural state by changing the temperature, turbidity, and flows of the river. This caused widespread alteration and destruction of spawning areas and a reduction of food sources for many species in the Missouri River. 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 are able to reproduce naturally and are self-sustaining.



Shovelnose (left) and Pallid (right) sturgeon



Jeff Gilson presenting the largest pallid sturgeon sampled during this year's effort. Length: 1094 mm Weight: 5352 g

Since recovery projects began in the early 2000's, very few adult pallid sturgeon in reproductive condition have been captured in the Middle Basin. Until 2007, the Middle Basin relied on the availability of Upper Basin progeny to stock into the river below Gavins Point Dam. Beginning in the spring of 2007, NGPC initiated focused efforts to collect adult broodstock from the Middle Basin for the stocking program. Broodstock efforts in 2008 and 2009, resulted in the capture of 13 adult male and 6 female pallid sturgeon that were successfully spawned in hatchery facilities producing approximately 19,000 progeny of which 10,644 have been stocked. These two year classes represent progeny of Middle Basin origin that have been stocked into the Missouri River.

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## Total Pallid Sturgeon Captures

A total of 167 pallid sturgeon were collected during the 2010 intensive broodstock collection efforts (Figure 1). Prior to the intensive effort, NGPC transported 7 adult pallid sturgeon to Gavins Point National Fish Hatchery in Yankton, SD while completing their standardized sampling using gill nets and trot lines. Thirty-seven of the 167 pallid sturgeon collected during the intensive effort were transported to Blind Pony State Fish Hatchery for evaluation of their sex and reproductive condition. Additionally, 107 known hatchery-reared and 23 pallid sturgeon of unknown origin were collected.

## Sex & Stage Determination

Upon arrival at the hatchery, broodstock fish were placed in race ways 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. Blind Pony is currently holding seven females and twelve males from both the 2010 broodstock effort and prior standardized sampling efforts; for a grand total of 19 reproductive fish. One reproductive female, however, was identified genetically as hatchery related and will be implanted with a telemetry tag for the spring rise evaluation research project. All fish that will not be used as current or future broodstock were released back into the river near their capture sites. Two of the seven reproductive females were captured prior to the broodstock effort and transported from Gavins Point National Fish Hatchery, and two immature females were shipped to Neosho National Fish Hatchery for future spawning.

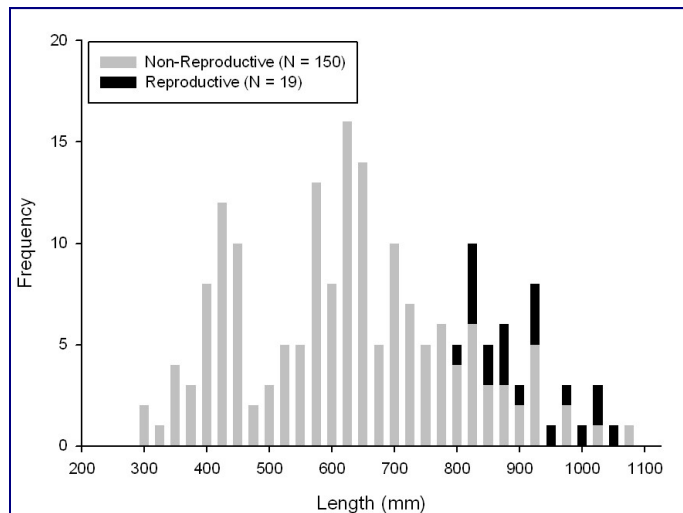


Figure 1. Number of pallid sturgeon caught per 25-mm length group during broodstock collection efforts, including two fish that were collected in the fall.

## Hatchery Recapture Data

With information gathered from tags in recaptured pallid sturgeon, 63 of the 107 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=32) represented 51% of the total catch followed by Gavins Point National Fish Hatchery (N=25), and Neosho National Fish Hatchery (N=6). The majority of hatchery-raised fish were stocked at Bellevue, NE (RM 604.1; N=26), Mullberry Bend, SD (RM 775.1; N=13), and Boonville, MO (RM 195.1; N=10). The largest downstream movement of a stocked pallid sturgeon was from St. Helena, SD (RM 799) to, Lower Copeland bend near Nebraska City, NE (RM 563.5) traveling 235.5 miles. The largest upstream movement was 397 miles from Boonville, MO (RM 195) to Platts-mouth, NE (RM 592). Recaptured pallid sturgeon of hatchery origin had been at-large for an average of 6 years. The shortest time at-large of any recaptured hatchery-reared pallid sturgeon was two years, while one pallid sturgeon was recaptured after eight years at large. The 2002 year class was the most represented year class with 29 individuals, followed by the 2005 (N=11) and 2001 (N=9) year classes. 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.



Andrea Wagner (USACE) holding a 808 mm non-reproductive wild male pallid sturgeon.



USACE District Commander COL Robert Ruch poses with a male pallid sturgeon captured near Nebraska City, NE.

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## Sampling Effort

A total of 109 volunteers, representing 5 universities and colleges, 7 government agencies, and several other organizations and businesses worked a total of 150 days. There were 12 NGPC Missouri River Program employees that lead this effort. With all help combined, 273 days of effort were exerted in a 12-day span. Daily efforts varied depending on the number of volunteers; however, four boats fished daily from Monday, April 5 through Saturday, April 16. A total of 346 trotlines was deployed resulting in 13,868 hook nights. Trotlines are used because they target sturgeon species, as sturgeons comprised 4,531 of 4,774 total fish sampled (95%).

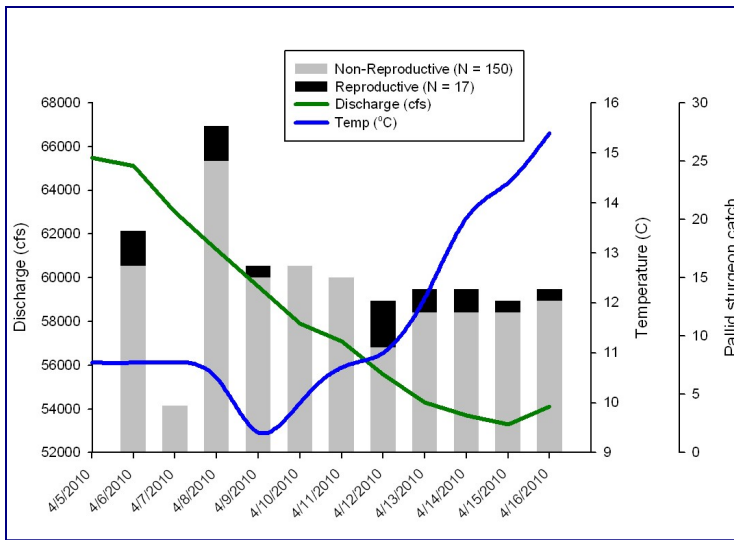


Figure 2. Number of pallid sturgeon collected by day, river discharge and temperature from 4/5/2010 through 4/16/2010 at Nebraska City, NE.

In addition to the 12-day intensive effort, NGPC crews collected 7 adult pallid sturgeon during standard sampling in the fall of 2009 and the spring of 2010. During these periods, pallid sturgeon were collected using multifilament experimental gill nets and trot lines.

During the intensive effort, pallid sturgeon (hatchery-reared and wild origin) were collected everyday that crews sampled. In addition, at least one adult pallid sturgeon (>750 mm) was transported to Blind Pony State Fish Hatchery for a reproductive diagnosis everyday. Catch rates of pallid sturgeon were stable throughout the 12-day period despite fluctuating water temperatures and a decreasing hydrograph (Figure 2). Compared to 2009, there was a dramatic decrease in flow during this year's intensive effort as temperature increased. Last year's catch rates correlated with increasing water temperature and flows.

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 9.4 to 15.4°C. Water levels were unusually high prior to broodstock efforts due to extensive snow melt and precipitation. However, during sampling discharge gradually decreased approximately 11,400 cubic-feet per second during the two week sampling effort. Crews also experienced fluctuating weather conditions. On April 7th, cold and rainy conditions prevailed with temperatures in the thirties with heavy rain, sleet and wind gusting to 40 mph. The following week temperatures increased and became more comfortable with the exception of a few windy days.

Sampling gears were deployed in a variety of habitat types and catch rates varied between areas.



Gerald Coats of Rock Creek Hatchery (NGPC) holding a 1000 mm, reproductive female that was transported to Blind Pony State Fish Hatchery.



Curt Bisgard (USACE), Chad Christiansen (UNL), and Natan Kershner (UNL) show off the three species of sturgeon found in the Missouri River; shovelnose, pallid and lake sturgeon



Erik Blechinger (USACE) gently releases an immature pallid sturgeon back into the water.

# PARTICIPANTS & VOLUNTEERS

Aaron Quin (USACE)  
 Adam Kendall (UNL)  
 Adam Sutton (UNL)  
 Alex Fischer (UNL)  
 Amanda Crane (USACE)  
 Andrea Faas (NGPC)  
 Andrea Wagner (USACE)  
Baxter Poe (PSC)  
Bill Garvey (NGPC)  
Blake Smith (NGPC)  
Brandon Eder (NGPC)  
 Brannon Bischoff (Kiewit)  
 Brice Stone  
 Bryce Jensen (UNL)  
 Cal Borden (UNL)\*  
Cameron Goble (UNL)  
 Carla Knight (UNL)  
 Chad Christiansen (UNL)  
 Chris Horihan (UNL)  
 Chris Wiehl (USACE)  
 Christian Luedtke\*  
 Cindy Upah (USACE)  
 Ian Malmstrom (Lourdes Central)  
 Clint Helms (Ft. Riley Bio.)\*  
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 Curt Bisgard (USACE)  
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 Dan Evasco (NGPC)  
 Dan Wiley (NPS)  
 Dane Pauly (NGPC)\*  
 Dave Crane (USACE)\*

Dave Oates (NGPC)  
 Dawn Rodriguez (USACE)  
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 Derik Lape (NGPC)\*  
 Diana Lindloff (UNO)  
 Dylan Tegtmeier  
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 Eric Cherko (U. of Iowa)  
 Erik Blechinger (USACE)  
 Erik Doran (UNL)  
 Erik Prenosil (PSC)\*  
 Evy Santiago (UNL)  
Frank Albrecht (NGPC)  
 George Williams (USACE)  
 Gerald Coates (NGPC)  
Gerald Mestl (NGPC)  
 Gordon Coke (Flatwater Group Inc.)  
 Grant Albrecht  
 Greg Hartel (NGPC)\*  
 Greg Hotovy (Walker)  
 Hans Otto (USACE)  
 Heather Hill (USACE)  
 Ian Malmstrom (Pius X)  
 Isaac Powell (Henry Doorly Zoo)  
 Jacob Tejral  
 Jacob Thompson (UNO)\*  
 Jared Meiergerd (PSC)  
Jared Stirling (USACE)  
 Jason Luebbe (NGPC)\*  
 Jeff Gilson (Lourdes Central)\*  
 Jeremy Grauf (UNL)

Jerrod Hall (NGPC)  
Jim Brannen (NGPC)  
 John Shelman (USACE)  
 John Walrath (UNL)  
 Jolene Hulsing (USACE)  
 Josh Kounovsky (UNL)  
 Josh Melliger (USACE)  
Josh Wilhelm (NGPC)  
 Joshua Loomis (UNL)  
 Justin Cermak (Flatwater Group Inc.)  
 Katherine Lawry (UNL)  
 Kelsea Nore (Nebraskaland)  
Ken Hatten (NGPC)  
 Kevin Steffensen (Walker)  
Kirk Steffensen (NGPC)  
 Larry Hutchinson (NGPC)  
 Laura Achterberg  
Lonny Zwickle (USPS)  
 Matt Hollman (NGPC)\*  
 Matt Schwarz (USFWS)\*  
 Matt Simpson (USACE)  
 Melissa Santiago (NGPC)  
 Michael Musil (UNL)  
 Michele Further Hurt (NGPC)  
 Michelle Koch (NGPC)  
Mick Sandine (USACE)  
 Mike Gilbert (USACE)\*  
 Mike Gilson (Elser American Meter Co.)  
 LtCol Monte Ten Kley (USMC)  
 Nathan Kershner (UNL)  
 Neal Bedlan (NPS)\*

Oley Cherko  
 Raeann Powers (NGPC)  
Randy Stutheit (NGPC)  
 Rickey Kia (NGPC)  
 COL Robert Ruch (USACE)  
 Russ Somsen (USACE)\*  
 Ruth Bentzinger (USACE)  
 Ryan Oliver (UNL)  
 Sarah Zink (USACE)  
Schuyler Sampson (NGPC)  
 Scott Flash (USACE)  
Scott Luedtke (NGPC)  
 Scott Mendlik (UNL)  
 Seth Barns (UNO)  
 Shannon Bell (UNL)  
 Shari Kunert (UNL)  
 Shaun Dunn (NGPC)  
 Steve Tegtmeier (LES)  
Susan Zwickle (NGPC)  
 Suzanne Gucciardo (NPS)\*  
 Tanner Stevens (UNL)\*  
 Taylor Sloey (UNL)  
 Theresa Martin (USACE)  
Tim Porter (NGPC)  
 Tim Welker (USACE)\*  
 Travis Kopf (NGPC)\*  
 Trevor Munkvold (USACE)\*  
 Weston Fleming (FHSU)\*  
 Zach Kohlhoff (PSC)  
**Participated 2 Year\***  
**Participated 3 Years**

# SAMPLING FACTS

- 167 - Total number of pallid sturgeon collected during the 2010 intensive effort
- 37 - Number of pallid sturgeon sent to the hatchery for evaluation during the 2010 intensive effort
- 19 - Number of pallid sturgeon in reproductive condition (7 females and 12 males)
- 1,094 mm and 5,352 g - Largest pallid sturgeon collected
- 4 - Total number of lake sturgeon collected
- 1 - Total number of pallid x shovelnose hybrids collected
- 4,365 - Total number of shovelnose sturgeon collected
- 5,966 lbs of shovelnose sturgeon collected
- 4,774 - Total number of fish collected
- 13.1 miles of trot lines deployed
- 13,900 - Approximate number of night crawlers used during this effort
- 1.6 miles - Length of all the Sturgeon sampled if laid end to end
- 1.3 miles - Length on all the night crawlers used if laid end to end
- 29°F - Coldest day
- 40 mph - Highest recorded wind speed
- 109 - Total number of volunteers (83 males and 26 females)
- 5 - Most days worked by volunteers (Russ Somsen USACE, Jared Stirling USACE)
- Pallid 470C493F38 has been sampled all three broodstock seasons and was spawned in 2009
- 597 pallid sturgeon have been sampled during the three broodstock efforts
- 64 - Number of reproductive fish collected in the last three years
- 1- American eel sampled

