

## 2013 NEBRASKA GAME AND PARKS COMMISSION BROODSTOCK COLLECTION

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### Pallid Sturgeon Recovery Efforts

The Nebraska Game and Parks Commission (NGPC) organized the sixth annual intensive effort targeted towards sampling pallid sturgeon in reproductive condition in the upper channelized Missouri River. Volunteers were solicited from area universities, colleges, state and federal agencies and the public to assist NGPC Missouri River Program personnel from Monday, April 1 through Friday, April 12.

Sampling crews targeted areas around the confluence of the Platte and Missouri Rivers (River Mile [RM] 595.0) downstream to Fraziers Bend south of Nebraska City, NE (RM 557.0). With the additional help from volunteers, crews were able to span a total of 27.8 river miles and sampled 9 different river bends.

Sampling was conducted using 200-foot trotlines with 40 hooks per line. Similar to previous efforts, trotlines were a valuable gear in the collection of pallid sturgeon broodstock. Eleven days of sampling resulted in the collection of 2,598 fish and 194 pallid sturgeon.



Left to right: John Bertino, Michelle Schultz, Col. Joel Cross and Lt. Col. Mark Martinez pose with a 986 mm and 4,385g reproductive male capture near Plattsmouth, NE.

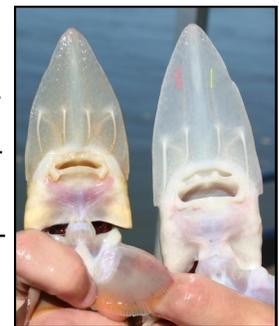
### Background

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 creation of dams and channelization 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, an artificial propagation



Lonnie Zwickle showing off the heaviest pallid sturgeon ever captured by NGPC. The fish was 1,052mm and 6,310g (13.9 lbs.). This reproductive male was captured north of Nebraska City, NE.

and stocking program was developed to ensure the persistence of the species until pallid sturgeon are able to reproduce naturally and become self-sustaining. Since recovery projects began in the early 2000's, adult pallid sturgeon in reproductive condition were not targeted in this reach of the Missouri River as the Middle Basin relied on the availability of Upper Basin progeny to stock into the river below Gavins Point Dam. However beginning in the spring of 2007, NGPC initiated a small scale effort focused to collect adult broodstock from the Middle Basin for the stocking program. Starting in 2008, NGPC organized and conducted a large scale effort targeted at collecting reproductively ready pallid sturgeon. This sampling along with standardize efforts from 2008 through 2012, resulted in the capture of 25 adult male and 14 female pallid sturgeon that were successfully spawned in hatchery facilities producing 49,804 progeny. These year classes represent the first progeny of Middle Basin origin that have been stocked into the Missouri River.



Shovelnose (left) and Pallid (right) sturgeon

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## Pallid Sturgeon Captures

A total of 194 pallid sturgeon were collected during the 2013 intensive broodstock collection effort, 33 of which were potential broodfish and were transported to Blind Pony State Fish Hatchery in Sweet Springs (Figure 1). An additional 14 pallid sturgeon were collected during the Population Assessment's standardized sampling and were transported to Gavins Point National Fish Hatchery. During the intensive broodstock effort, 153 known hatchery-reared pallid sturgeon and 41 of unknown origin (potentially "wild" with genetic results pending) were collected.

Upon arrival at the hatchery, broodstock fish were placed in raceways along with fish that had been collected by the Missouri Department of Conservation, the South Dakota Game, Fish and Parks Department and the U.S. Fish and Wildlife Service 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 using ultrasounds and endoscopy techniques. Currently, Gavins Point is holding 3 reproductive females and 2 reproductive males from prior standardized sampling efforts in 2012 and 2013. Blind Pony is holding 17 reproductive males and 5 reproductive females that were caught during this year's broodstock effort and are waiting genetic results to confirm wild origin. All fish not used as current or future broodstock will be released back into the river near their capture sites.

## Hatchery Recapture Data

With information gathered from PIT tags in recaptured pallid sturgeon, 89 of the 153 known hatchery-reared pallid sturgeon could be traced back to their hatchery, stocking site, and the year they were produced (i.e. year class). Fish reared at Neosho National Fish Hatchery (N=48) represented 57% of the total known hatchery catch followed by Gavins Point National Fish Hatchery (N=21) and Garrison National Fish Hatchery (N=20). The majority of hatchery-raised fish were stocked at the Lake Manawa Bend, IA (RM 608.8; N=25), Bellevue, NE (RM 601.4; N=14), and Nebraska City, NE (RM 563.0; N=11). The largest downstream movement of a stocked pallid sturgeon was from Sunshine Bottoms, NE (RM 866.2) through the Gavins Point Dam to Lower Civil Bend near Nebraska City, NE (RM 569.8) traveling 296.4 miles. There were five fish that were stocked above Gavins Point Dam (RPMA #3) that passed through the dam caught this year. The largest upstream movement was by two fish covering 394.0 miles from Boonville, MO (RM 195.0) to Tobacco Bend near Plattsmouth, NE (RM 589.0). Recaptured pallid sturgeon of hatchery origin had been at-large for an average of six years. The shortest time at-large of any recaptured hatchery-reared pallid sturgeon was two years, while 12 pallid sturgeon were recaptured after 11 years at large. The 2009 year class was the most represented year class with 51 individuals, followed by the 2002 (N=17) and 2007 (N=14).

Length Frequency of Pallid Sturgeon Collected

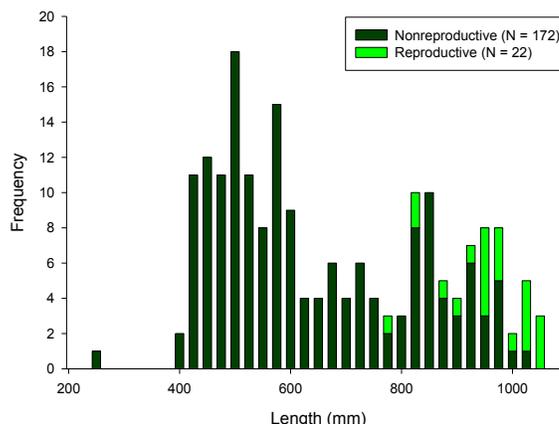


Figure 1. Number of pallid sturgeon caught per 25-mm length groups during the 2013 broodstock collection effort.



Above (left to right): Mike Eder, Mike Gilbert, Randy Stutheit, and Dave Borman show off 3 adult pallid sturgeon caught south of Plattsmouth, NE on the last day of this year's broodstock effort.

Below: Catching pallid sturgeon is a family affair for the Hulsings.



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## Sampling Effort

A total of 131 volunteers, representing universities, colleges, government agencies, and the public worked a total of 166 days. There were 15 NGPC Missouri River Program employees that led this effort and worked a total of 128 days. With all help combined, 294 days of effort were exerted in a 12-day span. Four boats fished daily from Monday, April 1 through Friday, April 12. A total of 440 trotlines were deployed resulting in 17,600 hook nights. The majority of fish collected were sturgeon species, as sturgeons comprised 1,986 of 2,598 total fish sampled (76%).

In addition to the 12-day intensive effort, NGPC crews collected 14 pallid sturgeon during standard sampling in the fall of 2012 and the spring of 2013. During these periods, pallid sturgeon were collected using multifilament experimental gill nets and trotlines. During the intensive effort, pallid sturgeon (known hatchery-reared and wild origin) were collected every day crews sampled. In 2013, there were 17 pallid sturgeon caught twice and one fish being caught three times. Potential reproductive ready adult pallid sturgeon (>800 mm) were transported to Blind Pony SFH for reproductive assessment on 9 of the 11 sampling days. Catch rates of pallid sturgeon and total fish caught were down from previous years' sampling (Figure 2). Historic catch rates over the past six year's broodstock collection efforts are presented in table 1.

Sampling gears were deployed in a variety of habitat types and catch rates varied between crews. 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 6.2 to 10.7°C, which was cooler than the previous year's low of 11.7°C. Average daily discharge levels during this two week period at Nebraska City was 38,100 cubic-feet per second (cfs), which is almost half of 2011 sampling effort's 75,600 cfs when catch rates were highest.

Total Fish Sampled by Broodstock Seasons

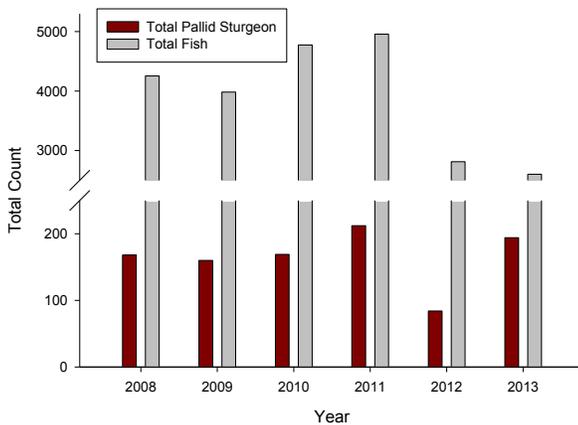


Figure 2. Total number of fish and pallid sturgeon caught during broodstock efforts from 2008-2013.



Thad Huenemann (NGPC) instructing Easton and Mitch Albrecht on proper trotlining techniques.

Historic Catch Numbers

Year	2008	2009	2010	2011	2012	2013	Overall
Total Fish	4,254	3,982	4,774	4,957	2,811	2,598	23,373
Total Pallids	168	160	167	212	84	194	985
# of Pallids Shipped	31	45	37	45	7	33	198
Progeny Produced*	6,663	14,593	6,812	21,736	Not stocked	N/A	49,804

Table 1. Total number of fish and pallid sturgeon captured then the subsequent number transferred to a hatchery for reproductive assessment during the intensive broodstock effort from the upper channelized Missouri River from 2008-2013. Progeny produced denotes all hatchery-reared fish stocked into the lower Missouri River.

## Side Stories - written by some of our volunteers

Christiansen, C. 2013. Outdoor Educator Learns How to Study Sturgeon. Nebraskaland Magazine online. Available: <http://outdoornebraska.ne.gov/blogs/2013/04/outdoor-educator-learns-study-sturgeon/> (April 2013)

Davis, M. 2013. Volunteers jump at chance to spot endangered sturgeon. Omaha World Herald. Available: <http://www.omaha.com/article/20130413/SPORTS/704139878>. (April 2013)

Williamson, E. 2013. Friendly competition part of sturgeon broodstock collection. US Army Corps of Engineers News. Available: <http://www.nwo.usace.army.mil/Media/NewsStories/tabid/1834/Article/12754/friendly-competition-part-of-sturgeon-broodstock-collection.aspx?> (April 2013)

## Links



NGPC Pallid Sturgeon Broodstock Facebook page: <http://www.facebook.com/NGPCpallid>.

NGPC Missouri River Program Flickr page: <http://www.flickr.com/photos/ngpc/sets/72157630760869282/>

# 2013 NEBRASKA GAME AND PARKS COMMISSION BROODSTOCK COLLECTION

## Sampling Facts

- 194 - Total number of pallid sturgeon collected during intensive effort
- 33 - Number of pallid sturgeon sent to the hatchery for evaluation
- 22 - Number of pallid sturgeon subsequently determined to be in reproductive condition (5 females and 17 males)
- 1,052 mm and 6,310 g (13.9 lbs.) - Heaviest pallid sturgeon ever collected by NGPC
- 7 - Total number of pallid x shovelnose hybrids collected
- 1,986 - Total number of shovelnose sturgeon collected
- 2,598 - Total number of fish collected
- 18 - Number of pallid sturgeon caught more than once this year
- 17.5 miles of trot lines deployed
- 17,600 - Approximate number of night crawlers used during this effort
- 1.82 miles - Distance of all night crawlers used if laid end to end
- 31°F - Coldest sampling day (wind chill 19°F)
- 131 - Total number of volunteers (91 males and 40 females)
- 7 - Most days worked by a volunteer (Jamie Jones, UNL)
- 1,087 - Total number of pallid sturgeon have been sampled during the six years of broodstock efforts
- 111- Number of reproductive pallid sturgeon collected in the last six years
- 23,373 - Total number of fish sampled during the six years of broodstock efforts.

## PARTICIPANTS & VOLUNTEERS

Aaron Lafler	COL Joel Cross	Gerald Mestl	Joe Helseth	Maryann Gamble	Rich Berggren
Adam Kendall	Cole Neibauer	Grant Albrecht	Joe Melnick	Matt Miller	Rick Eades
Adam Sutton	Cynthia Marin	Grant Gerlock	Joe Spooner	Matt Rabbe	Russ Wilhelm
AJ Young	Cynthia Martin	Heather Hottovy	John Bertino	Michele Fuhrer Hurt	Ryan Tvrdy
Amber Fandrich	Cynthia Upham	Henry Hulsign	John Shelman	Michelle Schultz	Sam Costello
Amy Young	Dale Alber	Ian Malmstrom	Johnathan Shelman	Mick Jensen	Sam Hulsign
Andy Young	Dan Foral	Jacob Hochstein	Jolene Hulsign	Mick Sandine	Sarah Zink
Angelina Wright	Dan Wiley	Jacob Salter	Josh Melliger	Mike Eder	Scott Brack
Ashely McAllister	Dane Pauley	Jacob Schaben	Josh Wilhelm	Mike Gilbert	Scott Luedtke
Austin Steiner	Dave Borman	Jake Holt	Justin Henning	Mitchell Albrecht	Scott Rupe
Blaise Weaver	Dave Crane	Jake Koenig	Justin Holub	Molly McWilliams	Sean Denning
Bob Incontro	Dave Deslauriers	Jamie Jones	Katie Lawry	Monica Keep	Sean McKeenan
Brandon Eder	Dave Lathrop	Jayne Wilhelm	Ken Hatten	Natalie Churchill	Seth Lundgren
Brett Anderson	Dave Oates	Jeff Blaser	Kevin Dytrych	Neal Bedlan	Steven Dytrych
Brian Byrd	Derek Tomes	Jeff Gilson	Kevin Steffensen	Nick Jenkins	Tanner Stevens
Brian Hammond	Dudley Sorensen	Jeff Kurrus	Kirk Steffensen	Noah Luedtke	Teresa Johnson
Candace Akins	Dylan Codr	Jeff Runge	Kurt Hulsing	Ole Cherko	Terra Swan
Carey Grell	Dylan Shelman	Jenna Beckman	Laura Heironimus	Pat Molini	Thad Huenemann
Carrie Adkisson	Easton Albrecht	Jennie Sutton	Leo Acosta	Patrick Dytrych	Tim Shew
Cecilia King	Eileen Williamson	Jenny Nguyen	Lonny Zwickle	Patrick Nitchals	Tony Barada
Christian Luedtke	Eric Cherko	Jenny Proescholdt	Lourdes Mena	Peyton Burt	Troy Rech
Christy Christiansen	Erik Prenosil	Jerrold Hall	LTC Mark Martinez	Raina Keel	Tucker Hochstein
Cindy Trail	Erinn Ipsen	Jessica Powell	Margaret Wilhelm	Randy Stutheit	Tyler Christiansen
Clayton Funk	Frank Albrecht	Joanne Ryan	Mark Davis	Rebecca Bozarth	Zach Schafer
Clayton Osburn	Frank Urzendowski				

## 5 Year and Beyond Volunteers

Without our volunteers we would not be able to continue this effort. We would especially like to acknowledge and thank those volunteers who have helped for five or more years. Our six year volunteers in 2013 were Dan Wiley, Frank Albrecht, Lonny Zwickle, Mick Sandine, Randy Stutheit, and Scott Luedtke. Our five year volunteers in 2013 were Christian Luedtke, Dave Crane, Jeff Gilson, Lourdes Mena, Mike Gilbert, and Tanner Stevens