

## 2014 NEBRASKA GAME AND PARKS COMMISSION BROODSTOCK COLLECTION

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### Pallid Sturgeon Recovery Efforts

The Nebraska Game and Parks Commission (NGPC) organized the seventh 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 Friday, April 4 through Tuesday, April 15.

Sampling crews targeted areas around the confluence of the Platte and Missouri Rivers (River Mile [RM] 595.0) downstream to Upper Barney Bend south of Hamburg, IA (RM 549.6). With the additional help from volunteers, crews were able to sample a total of 45.4 river miles which included 17 different river bends.

Sampling was conducted using 200-foot trotlines with 40 hooks per line. Eleven days of sampling resulted in the collection of 3,095 total fish and 221 pallid sturgeon, which were the most pallid sturgeon that have ever been caught during our intensive broodstock effort.



Left to right back row: Adam Kendall, Patrick Nitchals, Christa Webber, Rodger Kendall; front row: Randy Stutheit, and Dane Pauley pose with 6 pallid sturgeon near Plattsmouth, NE that were sent to Missouri Department of Conservation's Blind Pony State Fish Hatchery for reproductive assessment.

### 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 and stocking program was developed to ensure the persistence of the species until pallid sturgeon are able to reproduce naturally and become self-sustaining. Early stockings into this reach of the Missouri River relied on the availability of Upper Basin progeny. In the spring of 2007, NGPC initiated a small scale effort attempting to collect adult broodstock from the Middle Basin for the stocking program. This was expanded in 2008 when NGPC organized and conducted the first large scale effort targeted at collecting locally adapted reproductively ready pallid sturgeon. This sampling along with standardize efforts from 2008 through 2013 has resulted in the capture of 26 adult male and 15 female pallid sturgeon that were successfully spawned in hatchery facilities producing 51,337 progeny.



Shovelnose sturgeon (left) and Pallid sturgeon (right)



Cady Reinke showing off the second heaviest pallid sturgeon ever captured by NGPC. The fish was 1,156mm and 5,950g (13.1 lbs. and 45.5 inches). This nonreproductive female was captured north of Nebraska City, NE.

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## Pallid Sturgeon Captures

A total of 221 pallid sturgeon were collected during the 2014 intensive broodstock collection effort, 36 of which were potential broodfish and were transported to Blind Pony State Fish Hatchery in Sweet Springs, MO (Figure 1). An additional 13 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, 170 known hatchery-reared pallid sturgeon and 51 of unknown origin (potentially "wild" with genetic results pending) were collected.

Upon arrival at the hatchery, broodstock fish were placed in raceways 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 no reproductive females and 3 reproductive males from prior NGPC standardized sampling efforts in 2013 and 2014. Blind Pony is holding 12 reproductive males and 4 reproductive females that were caught during this year's NGPC'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. Additional fish were collected by the Missouri Department of Conservation, the South Dakota Game, Fish and Parks Department and the U.S. Fish and Wildlife Service.

## Hatchery Recapture Data

With information gathered from PIT tags in recaptured pallid sturgeon, 89 of the 170 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=40) represented 45% of the total known hatchery catch followed by Gavins Point National Fish Hatchery (N=29) and Garrison National Fish Hatchery (N=20). The most common stocking locations of recaptured hatchery-raised fish were Booneville, MO (RM 195.0; N=12), Mullberry, NE (RM 775.0; N=12), and Nebraska City, NE (RM 563.0; N=12). The largest downstream movement of a stocked pallid sturgeon was from Sunshine Bottoms, NE (RM 866.2) through the Gavins Point Dam to Upper Hamburg Bend (RM 553.0) traveling 312.2 miles. There were ten fish stocked above Gavins Point Dam (RPMA #3) that passed through the dam and were caught. The largest movement was by a fish that traveled upstream 400 miles from Booneville, MO (RM 195.0) to Upper Plattsmouth Bend (RM 595.0). Age of recaptured hatchery reared pallid sturgeon ranged from three to 15 years. There were 27 fish caught from both the 2002 and 2009 year classes, nine from 2007 and seven from 2008. We sampled fish from nine of the 15 years classes that have been stocked in the lower Missouri River.

Length Frequency of Pallid Sturgeon Collected

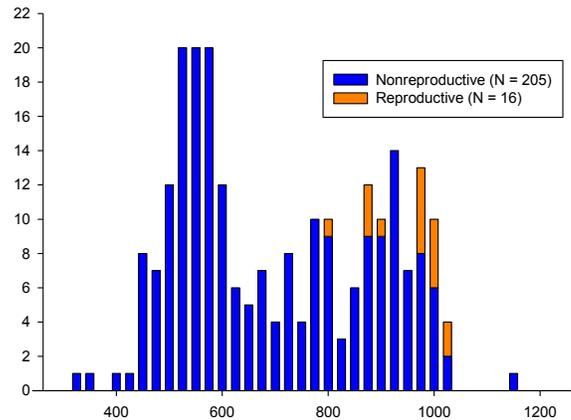


Figure 1. Number of pallid sturgeon caught per 25-mm length group during the 2014 broodstock collection effort.



Above (left to right): Scott Luedtke, Nate Rau, Noah Luedtke, and Sam Costello show off 4 adult pallid sturgeon caught south of Hamburg, IA.

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



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## Sampling Effort

Four boats fished daily from Friday, April 4 through Tuesday, April 15. A total of 138 volunteers, representing universities (4), colleges (3), government agencies (4), and the public worked a total of 163 days. There were 16 NGPC Missouri River Program employees that led this effort and worked a total of 132 days. All combined, 295 days of effort were expended during the 12-day span. A total of 440 trotlines were deployed resulting in 17,600 hook nights. The majority, 2,633 of 3,095 or 85% of fish collected were either pallid or shovelnose sturgeon.

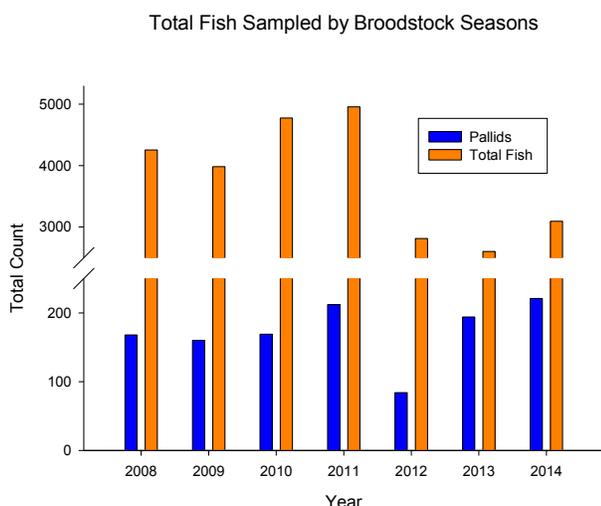


Figure 2. Total number of fish and pallid sturgeon caught during broodstock efforts from 2008-2014.

During the intensive broodstock effort the number of pallid sturgeon sampled ranged from nine to 33 per day. At least one pallid sturgeon was shipped each day the crews sampled. During this effort there were 16 pallid sturgeon caught twice and two fish caught three times. Catch rates of pallid sturgeon and total fish caught were up from the previous two years of sampling, with total pallid catches being the highest recorded during this effort (Figure 2). Historic catch rates over the past seven 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 4.6 to 12.4°C, which was a wider range than 2013 (6.2 to 10.7°C). Average daily discharge during this two week period at Nebraska City was 38,000 cubic-feet per second (cfs), or just about half of the 75,500 cfs seen in 2011 when we had our highest catch rates.

In addition to the 12-day intensive effort, NGPC crews shipped 13 pallid sturgeon during standard sampling in the fall of 2013 and the spring of 2014. During these periods, pallid sturgeon were collected using multifilament experimental gill nets and trotlines.

Historic Catch Numbers								
Year	2008	2009	2010	2011	2012	2013	2014	Overall
Total Fish	4,254	3,982	4,774	4,957	2,811	2,598	3,095	26,471
Total Pallids	168	160	167	212	84	194	221	1,210
# of Pallids Shipped	31	45	37	45	7	33	36	234
Progeny Produced*	6,663	14,593	6,812	21,736	**	1,533**		51,337

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 2008-2014. \*Progeny produced denotes all hatchery-reared fish stocked into the lower Missouri River. \*\*All fish from these year classes not yet stocked.

### 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/>

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## Sampling Facts

- **221 - Total number of pallid sturgeon collected during intensive effort**
- **36 - Number of pallid sturgeon sent to the hatchery for evaluation**
- **16 - Number of pallid sturgeon subsequently determined to be in reproductive condition (4 females and 12 males)**
- **13.1 Pounds - Second heaviest pallid sturgeon ever collected by NGPC**
- **2,407 - Total number of shovelnose sturgeon collected**
- **3,095 - Total number of fish collected**
- **18 - Number of pallid sturgeon caught more than once during the broodstock effort**
- **17.5 - Miles of trot lines deployed**
- **17,600 - Approximate number of night crawlers used during this effort**
- **1.82 - Miles of night crawlers used if laid end to end (measured by Kirk)**
- **19°F - Coldest sampling day**
- **85°F - Warmest sampling day**
- **138 - Total number of volunteers (103 males and 35 females)**
- **5 - Most days worked by a volunteer (Jamie Jones)**
- **1,210 - Total number of pallid sturgeon have been sampled during the seven years of broodstock efforts**
- **127- Number of reproductive pallid sturgeon collected in the last seven years**
- **26,471 - Total number of fish sampled during the seven years of broodstock efforts.**
- **1,020 - Cookies handed out by the tank truck drivers.**

## PARTICIPANTS & VOLUNTEERS

Aaron Lafler	Carrie Adkisson	Derek Tomes	Jamie Jones	Kyle Copple	Ray Johnson
Adam Buchli	Cecilia King	Diana Lindloff	Jamie Kindschuh	Kyle Pokorny	Rebecca Bozarth
Adam Kendall	Chad Heinrich	Dusty Schelditzki	Jeff Runge	Lindsey McVay	Rodger Kendall
Adam Rupe	Chase Hain	Dylan Shelman	Jehnsen Lebsock	LTC Mike Sexton	Ross Lawrence
Amanda Ciurej	Chaz Williamson	Dylan Turner	Jennie Sutton	Marcus Miller	Russ Wilhelm
Andrea Ciurej	Chloe Workman	Easton Albrecht	Jennifer Frisch	Mark James	Ryan Joe
Andrew Jensen	Christa Webber	Eileen Williamson	Jerrod Hall	Matt Miller	Ryan Walkowiak
Andy Hadland	Christine Chara	Elliot Gonnella	Jeslyn Williamson	Matt Rabbe	Sam Costello
Angelina Wright	Clayton Funk	Erik Karstensen	Jessica Powell	McKenzie Hauger	Sarah Zink
Ashley McAllister	Cody Dvorak	Evan Carroll	Joe Spooner	Michael Lewis	Scott Aden
Austin Jones	Cole Neibauer	Frank Urzendowski	Joel Ebert	Mike Eder	Scott Howard
Austin Steiner	Cooper Heinrich	Gerald Mestl	John Duis	Mitch Albrecht	Scott McLeay
Barry Spooner	Cyndi Trail	Grant Albrecht	John Shelman	Molly McWilliams-Barenz	Seth Lundgren
Bob Harms	Dakota Altman	Greg Wright	Jordan Nichols	Molly Womack	Sterling Winkleman
Bob Incontro	Dalton Christensen	Hank Schaardt	Josh Mead	Monica Keep	Teresa Johnson
Brandon Eder	Dan Foral	Harlee Phillips	Josh Wilhelm	Nate Rau	Terry Lundgren
Brett Andersen	Dan Larrick	Health Packett	Justin Holub	Nick Gollin	Tim Lambert
Brett Conyers	Dane Pauley	Holly Evans	Karla Jarecke	Nick Grable	Tim Shew
Brian Byrd	Dave Christensen	Jacob Alishouse	Ken Hatten	Noah Luedtke	Tim Sutton
Brian Hesford	Dave Lathrop	Jacob Keating	Kendra Thornburg	Patrick Lantis	Tom Malmstrom
Bryan Adams	Dave Sands	Jacob Phelps	Kerstin McIntyre	Patrick Nitchals	Travis Hazard
Cady Reinke	Dave Sprecher	Jacob Salter	Kevin Kruse	Phil Hall	Travis Shepler
Carissa Carlin	David Steele	Jake Drozda	Klyie Comba	Randi Steele	Trevor Hefley
Carolyn Reiland-Smith					

## Thanks to Our 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 seven year volunteers in 2014 were Frank Albrecht, Lonny Zwickle, Mick Sandine, Randy Stutheit, and Scott Luedtke. Our six year volunteers in 2014 were Dave Crane, Lourdes Mena, and Mike Gilbert. Our five year volunteers in 2014 were Adam Sutton, Ian Malmstrom, Johnathan Shelman, Katie Lawry, Michele Fuhrer Hurt, and Tony Barada.