

2017 NEBRASKA GAME AND PARKS COMMISSION BROODSTOCK COLLECTION

PALLID STURGEON RECOVERY EFFORTS

The Nebraska Game and Parks Commission (NGPC) - Fisheries Division organized the tenth 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 general public to assist NGPC Missouri River Program personnel from Monday, April 3rd through Friday, April 14th.

Four sampling crews targeted the area just upstream of the confluence of the Platte and Missouri Rivers (River Mile [RM] 596.0) downstream to Lower Barney Bend near Peru, NE (RM 548.0). With the additional help from volunteers, crews sampled approximately 48 river miles which included 19 different river bends.

Sampling was conducted using 200-foot trotlines with 40 hooks per line baited with nightcrawlers. Throughout the eleven day sampling effort, 17,498 hooks were deployed with 3,577 total fish captured including 105 Pallid Sturgeon, which resulted in 19 Pallid Sturgeon being assessed using ultrasound for reproductive readiness by NGPC staff before being transferred to Gavins Point National Fish Hatchery (NFH).



Chris Thompson, Matt Sierra, and Steve Kindschuh posing with an NGPC boat after assisting with the 2017 NGPC Pallid Sturgeon Broodstock Collection.

SPECIES BACKGROUND

Pallid Sturgeon are native to the Missouri and Mississippi River systems, and due to population declines, the species was listed as federally endangered in 1990. The construction of the mainstem dams and channelization drastically modified the river from its natural state by changing the temperature, turbidity, and natural flow regime of the river. Additionally, river modifications caused widespread alteration and destruction of spawning areas, blocked fish migrations and reduced food availability resulting in sharp declines of many native fish populations throughout 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 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 surplus fish from the Upper Basin (upstream of Garrison Dam) propagation program. In spring 2007, NGPC initiated a small scale effort to collect adult broodstock from the lower Missouri River. This effort was greatly expanded in 2008 when NGPC organized and conducted the first large scale effort targeted at collecting locally reproductively ready Pallid Sturgeon for the Propagation Program. Staff from the Missouri Department of Conservation have conducted similar collection efforts in reaches near St. Joseph, MO and Cooley Lake, MO. These local broodstock sampling efforts along with standardized efforts have resulted in 43 adult male and 25 adult female Pallid Sturgeon that have been successfully spawned in hatchery facilities producing 88,659 progeny.



First year volunteers, Ben Hall and Emma Steffensen showing off an unmarked Pallid Sturgeon that was shipped to the hatchery on the last day of the 2017 broodstock effort.

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PALLID STURGEON CAPTURES

A total of 105 Pallid Sturgeon were collected during the 2017 intensive broodstock collection effort, 19 of which were potential broodfish and were transported to Gavins Point NFH. Pallid Sturgeon lengths ranged from 270 mm (10.6") to 1,100 mm (43.3"); Figure 1) with an average length of 749 mm (29.5") while fish weights ranged from 30 g (0.07 lbs) to 4,900 g (10.8 lbs.) with an overall mean weight of 1,714 g (3.8 lbs). An additional 15 Pallid Sturgeon were collected during NGPC Population Assessment's standardized fall and spring sampling. Gavins Point NFH has dedicated two large tanks to hold broodfish from the lower Missouri River until they are reproductively ready. With these hold-over fish and NGPC's and MDC's 2017 broodstock efforts, Gavins Point NFH has 54 potential broodfish at their facility.

Currently, Gavins Point is holding 8 reproductive females and 13 reproductive males. Spawning efforts will occur from late-April to early-May and their progeny will be stocked this fall (i.e., September or October) or next spring (i.e., April or May) after they are tagged. All adult fish will be released back into the river near their capture sites with a select number of fish being surgically implanted with telemetry tags to increase our understanding of habitat use and movement patterns.

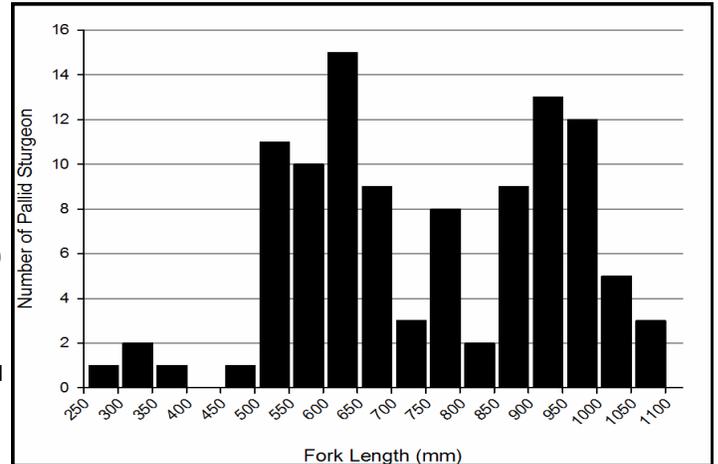


Figure 1. Length frequency of Pallid Sturgeon caught during the 2017 broodstock collection effort.



Top: Jamilynn Poletto, Jeff Alexander, Randy Stutheit, and Garrett Cook pose with four Pallid Sturgeon that were sent to the hatchery by the Plattsmouth South Crew.

Bottom: Jamie Kindschuh with the largest Pallid Sturgeon collected during the 2017 effort (1100mm, and 4900g).



HATCHERY RECAPTURE DATA

During the intensive broodstock effort, 81 known hatchery-reared Pallid Sturgeon, 12 known wild origin based on genetics, and 12 unknown origin (potentially wild with genetic results pending) were collected. Only known wild or potentially wild Pallid Sturgeon (e.g. no marks or tags) that have not been used for propagation previously were transferred to the hatchery. Three wild origin Pallid Sturgeon collected had been used previously for propagation and were not transported to the hatchery. There were 2 unmarked, sub-adult Pallid Sturgeon collected and genetic results are pending to determine if they were hatchery reared or wild fish.

It was possible to determine hatchery, stocking site, and the year they were produced (i.e. year class) for 29 of the 81 known hatchery-reared Pallid Sturgeon collected based on PIT tags. Fish reared at Neosho National Fish Hatchery (N=14) represented 48% of the total followed by Garrison National Fish Hatchery (N=8) and Gavins Point National Fish Hatchery (N=7). The most common stocking locations of recaptured hatchery-raised fish were Booneville, MO (RM 195.0; N=6), Bellevue, NE (RM 601.0; N=5), and Mulberry, NE (RM 775.0; N=5). There were 2 fish stocked above Gavins Point Dam (RPMA #3) that passed through the dam and were caught. Age of recaptured hatchery reared Pallid Sturgeon ranged from 2 to 16 years. In combination with PIT tag information and scute removal, 54 of the 81 hatchery-reared Pallid Sturgeon could be assigned to year class. The 2009 year class (N=14) was most represented followed by 2008 (N=10), 2002 (N=8) and 2001, 2003, 2006, 2010 and 2015 (N=3 for each year class). Hatchery-reared Pallid Sturgeon were sampled from 12 of the 18 year classes that have been stocked in the lower Missouri River.

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SAMPLING EFFORT

Four crews fished daily from Monday, April 3 through Friday, April 14. A total of 166 volunteers, representing universities, colleges, government agencies, and the public contributed a total of 188 days of assistance. There were 11 NGPC Missouri River Program employees that led this effort that worked a total of 124 days. All combined, 312 days of effort were expended during the 12-day effort which resulted in a total of 439 trotlines being deployed or 17,498 hook nights. The majority, 3,083 of 3,577 or 86% of the fish collected were either Pallid or Shovelnose Sturgeon. Channel Catfish (N = 126) were the most frequently captured non-sturgeon species followed by Blue Catfish (N = 122) and Freshwater Drum (N = 87). Overall, 14 different fish species were captured.

During the intensive broodstock effort, the number of Pallid Sturgeon captured ranged from 6 to 15 per day with at least one Pallid Sturgeon being shipped to the hatchery nine of the eleven days (shipped daily; max = 6). During this effort, 5 Pallid Sturgeon were caught multiple times (four were captured twice, and one was captured three times). Catch rates of Pallid Sturgeon and number transported to Gavin's Point NFH were similar to last year, but drastically lower than most previous years (Table 1). Overall, one Pallid Sturgeon was captured for every 167 hooks retrieved and one Pallid Sturgeon was transferred to the hatchery for every 924 hooks retrieved. Historic catch rates from the past ten years broodstock collection efforts are presented below (Table 1).

Historic Catch Numbers

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Overall
Total Fish	4,254	3,982	4,774	4,957	2,811	2,598	3,095	4,869	4,048	3,577	38,965
CPUE (fish/line)	14.0	9.4	13.8	10.9	5.8	5.9	5.7	8.8	9.2	8.1	9.0
Total PDSG	168	160	167	212	84	194	221	212	110	105	1633
PDSG Shipped	31	45	37	45	7	33	36	43	21	19	317
Progeny Produced	6,663	14,593	6,812	21,736	99	6,053	19,582	12,513	608	--	88,659

Table 1. Total number of fish and Pallid Sturgeon (PDSG) captured then the subsequent number transferred to a hatchery for reproductive assessment during the intensive broodstock effort from the upper channelized Missouri River from 2008-2017.

Sampling gears were deployed in a variety of habitat types and catch rates were highly variable between crews (Table 2). Overall, the Plattsmouth South crew collected the most Pallid Sturgeon and shipped the most fish to Gavins Point National Fish Hatchery. The Plattsmouth North crew collected the most fish overall. The two Nebraska City crews had very similar numbers.

During this effort, water temperatures ranged from 9.7 to 13.5°C, which were very similar to last year (9.4 to 12.5°C).

Average daily discharge during this two week period at Nebraska City was 47.2 kcfs and only varied 4.5 kcfs, which was similar to the past four years, but approximately half of the 75.5 kcfs seen during 2011.

Acknowledgement

The United States Army Corps of Engineers provided funding for the NGPC Pallid Sturgeon Population Assessment, Habitat Assessment and Monitoring, and Research Projects to conduct the 2017 Broodstock effort. This effort would not be possible without USACE support.

Capture Rates

Crew	Plattsmouth North	Plattsmouth South	NE City North	NE City South
Total Fish	1,107	669	878	923
Total PDSG	17	38	27	23
PDSG Shipped	5	8	3	3

Table 2. Total number of fish, Pallid Sturgeon (PDSG) captured and shipped by crew during the 2017 Intensive Broodstock Collection Effort.



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SAMPLING FACTS

- 3,577 - Total number of fish collected
 - 105 - Pallid Sturgeon
 - 2,978 - Shovelnose Sturgeon
 - 1 - Hybrid Pallid x Shovelnose Sturgeon
 - 1 - Silver Chub
 - 14 different species
- 19 - Number of Pallid Sturgeon sent to the hatchery for evaluation
 - 15 - Pallid Sturgeon shipped to the hatchery prior to our broodstock effort
 - 54 - Pallid Sturgeon currently being held-over at Gavins Point National Fish Hatchery
- 5 - Number of Pallid Sturgeon subsequently determined to be in reproductive condition from the 19 transported
 - 2 females and 3 males
- 10.8 lbs. - Heaviest Pallid Sturgeon collected
- 43.3" - Longest Pallid Sturgeon collected
- 17.0 - Miles of trot lines deployed
- 17,498 - Approximate number of nightcrawlers used
- 1.66 - Miles of night crawlers used if laid end to end
- 8 - Number of worms eaten by volunteers/NGPC staff
- Coldest (25°F) & warmest sampling day (81°F)
- 49 mph - Highest recorded wind speed
- 3,090 - Estimated number of hours worked by NGPC personnel and volunteers
- 3 - Most days worked by a volunteer (Randy Stutheit)
- 1,633 - Total number of Pallid Sturgeon sampled during the ten years of broodstock efforts
- 161 - Number of reproductive Pallid Sturgeon collected in the last ten years
- 38,965 - Total number of fish sampled during the ten years
- 16,570 - Total number of volunteer hours since 2008 which is equivalent to 8 full time employees working for a year or approximately \$265,000 in wages.
- 704 Unique volunteers over the ten year broodstock effort

Service years for unique volunteers

- 1 year = 461
- 2 year = 124
- 3 year = 50
- 4 year = 26
- 5 year = 18
- 6 year = 10
- 7 year = 6
- 8 year = 2
- 9 year = 2
- 10 year = 5

PARTICIPANTS & VOLUNTEERS

Aaron Fryzek	Brian Byrd	Diana Lindloff	Jennie Sutton	Kyle Liebig	Mike Carrick	Ryan Wendling
Aaron Lafler	Bryan Adams	Doug Meigs	Jeremy Randall	Kylie Comba	Mike Gilbert	Sam Cowan
Adam Sutton	Bryce Gurhen	Dylan Shelman	Jessie Hall	Larry Andersen	Minh Thai	Sandy Kendall
Adena Barela	Bryce Zimmerline	Easton Albrecht	John Larsen	Lee Lehn	Miranda Cynova	Sarah Miller
Alex Eifert	Cady Reinke	Emma Steffensen	John Vrtiska	Lennis Blecha	Mitch Albrecht	Sarah Nodskov
Alex Engel	Camden Bohaty	Evan Carroll	Johnathan Shelman	Logan Hughes	Monica Macoubrie	Sarah Oliver
Alexis Fedele	Camile Svoboda	Frank Albrecht	Johnathan Shelman Jr.	Lonny Zwickle	Morgan Ransiear	Schuyler Tomes
Alexis Shorb	Carlee Groff	Frank Urzendowski	Jordan Georges	Lucas Eifert	Nathan Kush	Scott Luedtke
Alisha Grams	Carson Groff	Garrett Cook	Jordan Nichols	Luke Andrew	Nolan Watkins	Scott Wolfe
Andrea Hennings	Charie DeShazer	Grant Albrecht	Josh Buregge	Mackenzie Zwiener	Peter Lux	Sean Wendling
Arden Cornwell	Chris Nun	Grant Beckman	Josh Donahoo	Madison Hanley	Peter Magnin	Shaeli Ekstein
Ashley Kowalski	Chris Shank	Halley Gallagher	Josh Wilhelm	Marcus Miller	Philip Hall	Shaun Dunn
Ben Hall	Chris Thompson	Harlee Phillips	Joshua Garner	Maria Hansgaard	Quade Brees	Steve Kendall
Ben Harms	Christine Ruskamp	Heath Packett	Katie Liebig	Mat Lehn	Rachel Neisius	Steve Kindschuh
Bill Wendling	Cody Hall	Hunter Howard	Keith Koupal	Matt Miller	Randy Stutheit	Terry Lundgren
Blake Nun	Dan Feral	Hunter Runge	Kelly Duckert	Matt Sierra	Ray Johnson	Tim Bohaty
Bob Incontro	Daniel Estrella	Isaac Baker	Kevin Juszyk	Matt Warren	Rebecca Podkowka	Tim Shew
Bob Korgie	Daniel VanderVeen	Isaiah Lockard	Kevin Steffensen	Matthew Curtis	Rick Wilson	TJ Fontaine
Brad Eifert	Dante Koupal	Jacob Brown	Kimberly Brown	Maverick Burns	Rob Korgie	Tony Barada
Brandon Esch	Dave Crane	Jaden Cooper	Kirk Pawloski	McKenzie Hauger	Robert Harms	Trent Lundgren
Brannon Hall	Dave Lathrop	Jamilynn Poletto	Krystal Rose Bialis	Michael Randall	Rodger Kendall	Trevor Bohaty
Brenden Haas	Dave Oates	Jeff Alexander	Kyla Mohr	Michele Fuhrer Hurt	Ross Lawrence	Vicky Cowan
Brent Hall	Dennis Stille	Jeff Runge	Kyle Bubb	Michelle Koch	Russ Wilhelm	
Brett Andersen	Derek Kane	Jehnsen Lebsock	Kyle Copple	Mick Sandine	Ryan Joe	

We want to thank all of our volunteers without whom this effort would not be possible.