

2015 NEBRASKA GAME AND PARKS COMMISSION BROODSTOCK COLLECTION

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Pallid Sturgeon Recovery Efforts

The Nebraska Game and Parks Commission - Fisheries Division organized the eighth 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 6 through Friday, April 17.

Five sampling crews targeted the area from the confluence of the Platte and Missouri Rivers (River Mile [RM] 595.0) downstream to Lower Barney Bend south of Hamburg, IA (RM 546.2). With the additional help from volunteers, crews sampled approximately 50 river miles which included 18 different river bends.

Sampling was conducted using 200-foot trotlines with 40 hooks per line baited with nightcrawlers. Throughout the eleven day sampling effort, 22,000 hooks were deployed with 4,896 total fish and 212 pallid sturgeon collected, which included 43 pallid sturgeon transferred to hatchery facilities for reproductive assessment.



Left to right Bob Harms (USFWS), Tony Korth (NGPC), Matt Rabbe (USFWS), and Jeff Runge (USFWS) pose with 4 pallid sturgeon near Plattsmouth, NE.

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 as populations of many native fish species have shapely declined throughout the Missouri River. Several recovery projects have been initiated to monitor the current population status of pallid sturgeon and other native river species, to 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 surplus fish from Upper Basin progeny. However in the spring 2007, NGPC initiated a small scale effort and attempted to collect adult broodstock from the Middle Basin for the stocking program. 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 from the Propagation Program. Since then, staff from the Missouri Department of Conservation have conducted similar collection efforts. These local broodstock sampling efforts along with standardized efforts have resulted in the capture of 31 adult male and 19 female pallid sturgeon that were successfully spawned in hatchery facilities producing 75,538 progeny.



Rebecca Bozarth (USACE) showing off a pallid sturgeon captured during the coldest day of the 2015 broodstock effort.

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Pallid Sturgeon Captures

A total of 212 pallid sturgeon were collected during the 2015 intensive broodstock collection effort, 43 of which were potential broodfish and were transported to Gavins Point National Fish Hatchery (N = 18) and Blind Pony State Fish Hatchery in Sweet Springs, MO (N = 25). Pallid sturgeon lengths ranged from 341 mm (13.4") to 1,180 mm (46.5"; Figure 1) with weights ranging from 130 g (0.3 lbs) to 5,186 g (11.4 lbs.). An additional 15 pallid sturgeon were collected during NGPC's Population Assessment's standardized sampling and were transported to Gavins Point NFH. Overall, during the intensive broodstock effort, 150 known hatchery-reared pallid sturgeon and 62 of unknown origin (potentially "wild" with genetic results pending) were collected. Only suspected "wild" pallid sturgeon (e.g. no marks or tags) are transferred to the hatchery; therefore, 19 unmarked, sub-adult pallid sturgeon were collected.

Upon arrival at the hatchery, broodstock fish were placed in raceways until a reproductive diagnosis could be conducted. Currently, Gavins Point is holding 2 reproductive females and 9 reproductive males and Blind Pony is also holding 2 reproductive females and 9 reproductive males. Spawning efforts will occur in late-April to early-May and their progeny will be stocked early fall or next spring. All fish will be released back into the river near their capture sites.

Hatchery Recapture Data

With information gathered from PIT tags in recaptured pallid sturgeon, 61 of the 150 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=23) represented 38% of the total known hatchery catch followed by Gavins Point National Fish Hatchery (N=22) and Garrison National Fish Hatchery (N=16). The most common stocking locations of recaptured hatchery-raised fish were Booneville, MO (RM 195.0; N=9), Bellevue, NE (RM 601.0; N=7) and Mulberry, NE (RM 775.0; N=6). The largest downstream movement of a stocked pallid sturgeon was from Sunshine Bottoms, NE (RM 866.2) through the Gavins Point Dam to Otoe Bend (RM 557.0) traveling 309.2 miles. There were 12 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 4 to 23 years. The 2002 year class (N=18) was most represented followed by the 2009 YC (N=17) and the 2001, 2007 and 2008 YC's (N=4). Hatchery-reared pallid sturgeon were sampled from 11 of the 17 years classes stocked in the lower Missouri River.

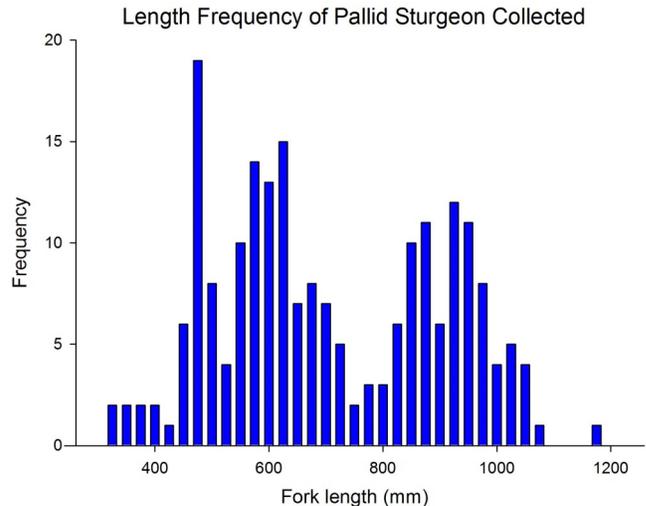


Figure 1. Length frequency of pallid sturgeon caught during the 2015 broodstock collection effort.



Above: Marc Miller (USACE) displays a big hatchery-reared pallid sturgeon.

Below: Amanda Kelly and Kai Kelly show off a pallid sturgeon with



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Sampling Effort

Five crews fished daily from Monday, April 6 through Friday, April 17. A total of 175 volunteers, representing universities, colleges, government agencies, and the public worked a total of 210 days. There were 20 NGPC Missouri River Program employees that led this effort and worked a total of 146 days. All combined, 356 days of effort were expended during the 12-day effort. A total of 550 trotlines were deployed resulting in 22,000 hook nights. The majority, 4,410 of 4,896 or 90% of fish collected were either pallid or shovelnose sturgeon. Additionally, channel catfish (N = 207) were the most frequently captured non-sturgeon species followed by freshwater drum (N = 66) and blue catfish (N = 65). Overall, 14 different fish species were captured.

During the intensive broodstock effort, the number of pallid sturgeon captured ranged from 9 to 27 per day with at least one pallid sturgeon shipped each day the crews were fishing (shipped daily; min = 1 - max = 9). During this effort, there were 15 pallid sturgeon caught twice. Catch rates of pallid sturgeon were similar to the past couple year's, but the total number of fish caught was substantially higher (Table 1). Historic catch rates over the past eight year's broodstock collection efforts are presented below.

Historic Catch Numbers									
Year	2008	2009	2010	2011	2012	2013	2014	2015	Overall
Total Fish	4,254	3,982	4,774	4,957	2,811	2,598	3,095	4,869	31,367
CPUE (fish / line)	14.0	9.4	13.8	10.9	5.8	5.9	5.7	8.8	9.3
Total PDSG	168	160	167	212	84	194	221	212	1,418
PDSG Shipped	31	45	37	45	7	33	36	43	277
Progeny Produced	6,663	14,593	6,812	21,736	99	6,053	19,582*		75,538

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 2008-2015. *Additional fish being reared at Neosho National Fish Hatchery.

Sampling gears were deployed in a variety of habitat types and catch rates were highly variable between crews (Table 2). Overall, there was a tie between the Plattsmouth South and Nebraska City North crew for the number of pallid sturgeon shipped to the hatcheries. While the Plattsmouth North crew edged the Hamburg crew for the total number of fish collected, the Hamburg crew captured the only lake sturgeon and first since our 2012 effort.

Capture Rates by Crew					
	Plattsmouth North	Plattsmouth South	NE City North	NE City South	Hamburg
Total Fish	1,189	620	838	1,066	1,116
Total PDSG	53	42	45	43	29
PDSG Shipped	9	10	10	5	9

Table 2. Total number of fish, pallid sturgeon (PDSG) captured and shipped by crew during the intensive broodstock effort from the upper channelized Missouri River from 2008-2015.

While the Plattsmouth North crew edged the Hamburg crew for the total number of fish collected, the Hamburg crew captured the only lake sturgeon and first since our 2012 effort.

During this effort, water temperatures ranged from 9.7 to 17.2°C, which were warmer than 2014 (4.6 to 12.4°C).

Average daily discharge during this two week period at Nebraska City was 39,100 cubic-feet per second (cfs) and only varied 2,700 cfs, which was similar to the past three years, but approximately half of the 75,500 cfs seen during our 2011 efforts.

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

- **4,896 - Total number of fish collected**
 - 212 - Pallid sturgeon
 - 4,198 - Shovelnose sturgeon
 - 1 - Lake sturgeon
 - 11 - Hybrid sturgeon
- **43 - Number of pallid sturgeon sent to the hatchery for evaluation**
 - 15 - Pallid sturgeon shipped to the hatchery prior to our broodstock effort
- **22 - Number of pallid sturgeon subsequently determined to be in reproductive condition**
 - 4 females and 18 males
- **11.4 Pounds - Heaviest pallid sturgeon collected**
- **46.5 inches - Longest pallid sturgeon collected**
- **20.8 - Miles of trot lines deployed**
- **22,000 - Approximate number of night crawlers used**
- **1,829 - Miles of night crawlers used if laid end to end**
- **36°F - Coldest sampling day**
- **75°F - Warmest sampling day**
- **175 - Total number of volunteers**
- **3,560 - Estimated number of hours worked by NGPC personnel and volunteers**
- **4 - Most days worked by a volunteer (Randy Stutheit)**
- **1,418 - Total number of pallid sturgeon sampled during the eight years of broodstock efforts**
- **149 - Number of reproductive pallid sturgeon collected in the last eight years**
- **31,367 - Total number of fish sampled during the seven years of broodstock efforts.**

PARTICIPANTS & VOLUNTEERS

AJ Young	Dakota Barg	Jake Holt	Lauren Southard	Rachel Neisius	Brandon Eder
Alex Flynn	Dale Albert	Jake Kloefkorn	Lindsey Messinger	Randy Stutheit	Brian Hammond
Allan Hughes	Dan Andersen	Jamie Spooner	Logan Hughes	Rebecca Bozarth	Dane Pauley
Amanda Ciurej	Dan Foral	Jason Smith	Logan Pierce	Rick Lafler	Dave Adams
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Austin Steiner	Dawson Mertens	Jennie Sutton	Luke Wallace	Russ Wilhelm	Jerrod Hall
Bill Wendling	Derek Kane	Jeremy Randall	Lyndsie Wszola	Ryan Vencil	Joe Spooner
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Brad Thompson	Eileen Williamson	Johnathan Shelman	Matt Rabbe	Sarah Zink	Riley Schubert
Brent Hall	Eric Cherko	Jordan Mejkstrik	Matthew Perrion	Scott Luedtke	Ryan Ruskamp
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Bryan Adams	Gailynn Alberts	Katie Lawry	Mick Sandine	Tim Shew	
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Carolyn Wardell	Greyson Engle	Kendra Thornburg	Molly McWilliams-Barenz	Travis Shepler	
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Cody Grewing	Heather Johnson	Kevin Steffensen	Nicholas Gollin		
Cody Hall	Isaac Beber	Kirk Pawloski	Noah Luedtke		