



## MISSISSIPPI INTERSTATE COOPERATIVE RESOURCE ASSOCIATION

### PADDLEFISH & STURGEON COMMITTEE

#### MEETING MINUTES

15-16 January 2019

Holiday Inn Express Downtown, Nashville, Tennessee

15 JANUARY 2019

#### WELCOME/INTRODUCTIONS/OPENING REMARKS

The meeting was called to order at 8:30 am by Eric Ganus (Committee Chair) who introduced himself and welcomed the MICRA Paddlefish & Sturgeon Committee to the meeting. A roll call of Delegates was conducted; it was determined that a quorum was not met. In the absence of a Assistant Chairperson, Joe McMullen volunteered to take meeting notes. The agenda was distributed and finalized, and the meeting was called to order. **\*Eric will send out the 2018 (St. Louis) meeting minutes to state representatives for approval.** Participant introductions ensued.

#### PARTICIPATION

*MICRA Paddlefish & Sturgeon Committee Chairperson and Delegate from Tennessee:* Eric Ganus

*Delegates:* Craig Jansen (IN), Joe McMullen (MO), Gerald Mestl (NE), Bobby Reed (LA; call-in), Jason Schooley (OK), Nick Schlessler (MN; call-in), Jason Sorensen (SD)

*MICRA Coordinator:* Greg Conover (USFWS)

*Guests:* Stephen Floyd (WV), Adam Geik (OK), Ryan Hupfeld (IA), Steve Kinne (IN), Jeff Koch (KS), Travis Moore (MO), Jessica Morris (KY), Sara Tripp (MO), Chelsea Tucker (AR), Trish Yasger (MO)

#### ASSISTANT CHAIRPERSON ELECT NOMINATIONS

Eric Ganus will continue to serve as the Chairperson of the committee.

**\*Eric will contact LMR sub-basin state representatives and nominate an Assistant Chair to serve during his term.**

## OLD BUISNESS

*Nothing to Report*

## NEW BUISNESS

### *MICRA Paddlefish & Sturgeon Committee Update*

Eric Ganus updated the group on the purpose and goals of the [MICRA Paddlefish & Sturgeon Committee](#), and MICRA Strategic Plans: [MICRA Priorities & Accomplishments 2014-2018](#) and [MICRA Priorities 2019-2023](#).

- **Goal 1:** Identify and prioritize issues and concerns affecting paddlefish and sturgeon resources in the Mississippi River Basin and develop a mechanism for addressing them.
- **Goal 2:** Facilitate communication and coordination among entities responsible for paddlefish and sturgeon resource management in the Mississippi River Basin.
- **Goal 3:** Develop a basin-wide information management program based upon standard methods for collecting and reporting paddlefish and sturgeon fishery resource data.
- **Goal 4:** Identify and coordinate paddlefish and sturgeon research, management, culture and recovery programs.
- **Goal 5:** Facilitate basin-wide conservation, protection, and restoration of paddlefish and sturgeon habitats.
- **Goal 6:** Seek basin-wide consensus regarding paddlefish and sturgeon conservation and management through development of uniform, compatible regulations and policies.
- **Goal 7:** Increase the public's (1) awareness of the existence of paddlefish and sturgeon species, (2) appreciation of the ecological and economic importance of these species, and (3) understanding of the environmental and human-related impacts that threaten their welfare and continued existence.

***\*Oklahoma Paddlefish Management Plan and the Economics of the Oklahoma Paddlefish Fishery should be posted on the MICRA website.***

***\*Draft Lower Mississippi River Paddlefish Management Plan should be posted on the MICRA website (there is a need for states to adopt minimum standards (e.g., F 30)).***

***\*SEAFWA/SDAFS Fish Health Plan is in draft and should be posted to the MICRA website once it is finalized.***

***\*There is a need for standardized summary and documentation of interstate paddlefish harvest and harvester data.***

*Paddlefish Tag Database - Jason Schooley:*

- Jason queried the states on database use in April 2018 and received 18 responses (15 states, 14 state representatives).
- There is a lack of participation due to the complexity involved with data entry forms and queries. A short-term solution may be batch uploads with the use of a preformatted excel file.
- Group Discussion:
  - o Gerald Mestl explained that the complexity of the database may be necessary to accomplish the tasks that it was designed to do (e.g., track multiple recaptures). Simplifying the database may decrease its usefulness. We need to first identify our needs and then ensure that the database is structured to meet them.
  - o An Excel spreadsheet data entry option could expedite backlogged data entry.
  - o Access to the database has become an issue. In the past a new copy of the database has been distributed to members at each meeting. The group discussed posting a simplified database in a centralized location for ease of access (e.g., cloud based). Only MICRA representatives should have access to the database (there could be some state firewall issues to overcome).
  - o Questions: Do untagged fish belong in the database? Do FLOY, PIT, and/or jaw banded fish belong in the database? Should the group move toward the use of PIT tags instead of CWTs (could be expensive and time consuming)?
- The Committee used to hand out data sheets with unique ID's but has abandon this practice. **\*The committee should establish a protocol to ensure that numbers are not duplicated.**
- **\*Jason Schooley will create a report for each agency to identify data currently in the database so that staff can identify missing data and document the current backlog.**
- **Jason Schooley will add a *comment* field and *PIT* field to the database.**
- **\*A Committee vote is needed to approve of housing the database on a cloud based platform such as Google Drive.**
- **\*State representatives should work toward addressing the backlog of data during 2019.**

*Commercial Fishing Law Enforcement: Steve Kinne:*

- Steve updated the group on commercial fishing law enforcement activities and issues.
- There is a need for states to dedicate law enforcement staff to commercial fishing issues, a centralized, multi-state database, and interagency law enforcement training.
- Complicated and varied regulations necessitate knowledge of many states' rules.
- 'We need to hold commercial fishers to a higher standard than sport anglers because it's their job'.
- Recreational harvesters may be selling paddlefish eggs to commercial fishers.
- **\*The Committee should establish a list of law enforcement contacts in each state.**
- **\*The Committee should establish a list of methods to request commercial fishing information in each state.**

## 16 JANUARY 2019

### *Commercial Paddlefish Fishery Modeling Project Update – Michael Wilberg*

- Modeling included a separate analysis for each state and river (presentation attached).
- **\*Michael Wilberg will pool and model all data and schedule a conference call to discuss the results.**
- **\*Eric Ganus will request information on paddlefish harvest and participation from states.**
- **Sara Tripp will provide Michael Wilberg with Missouri's length at maturity data to refine the model.**

### *Paddlefish Symposium 2017 – Jason Schooley*

- So far, 12 of 13 chapters of the conference proceedings have been proofed; the deadline for final chapter 13 January 2019. Proceedings are anticipated 'soon'.

### *Commercial Paddlefish Workgroup / SK Grant Update – Dennis Scarnecchia*

- All paddlefish samples submitted to Dr. Scarnecchia have been aged and pictures have been sent back to the states.
- Samples are cataloged and stored at University of Idaho.
- The SK Grant proposal was submitted for the 5 year in September 2018 and is currently in review.
- **\*Dr. Scarnecchia will inform the group on the outcome of the proposal/funding in spring 2019.**

### *Adjourn:*

Eric Ganus adjourned the meeting.

# Analysis of paddlefish data for the Mississippi and Ohio Rivers

Mike Wilberg

Chesapeake Biological Laboratory

University of Maryland Center for Environmental Science

# Paddlefish sampling data received

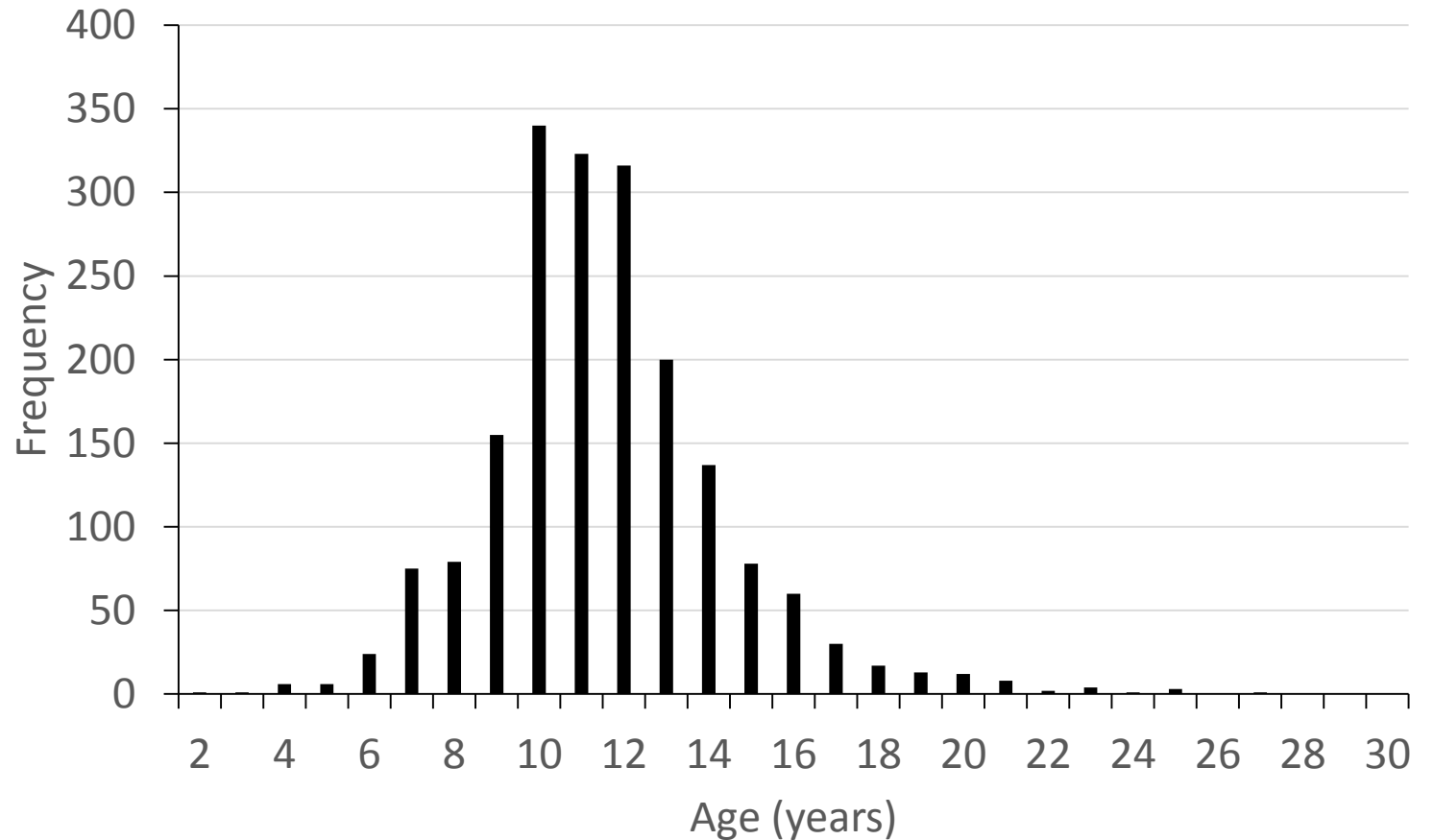
- Tennessee
  - Missouri
  - Kentucky
  - Indiana
  - Mississippi
- 
- Maturity data from Arkansas

# Analyses

- Estimated mortality rates using the Chapman-Robson method
- Estimated  $L_{inf}$  as the average EFL of the age-20+ fish (by sex)
- Estimated length-weight relationships for each area (using curved EFL)
- Estimated selectivity (relative vulnerability to the sampling gear, which includes effects of gear, location, timing, etc.) and K using an equilibrium model fitted to age and length composition data
- Updated to maturity at length (from maturity at age)
- Modified spawning frequency to every other year
- Estimated SPR reference points for comparison with mortality rate estimates

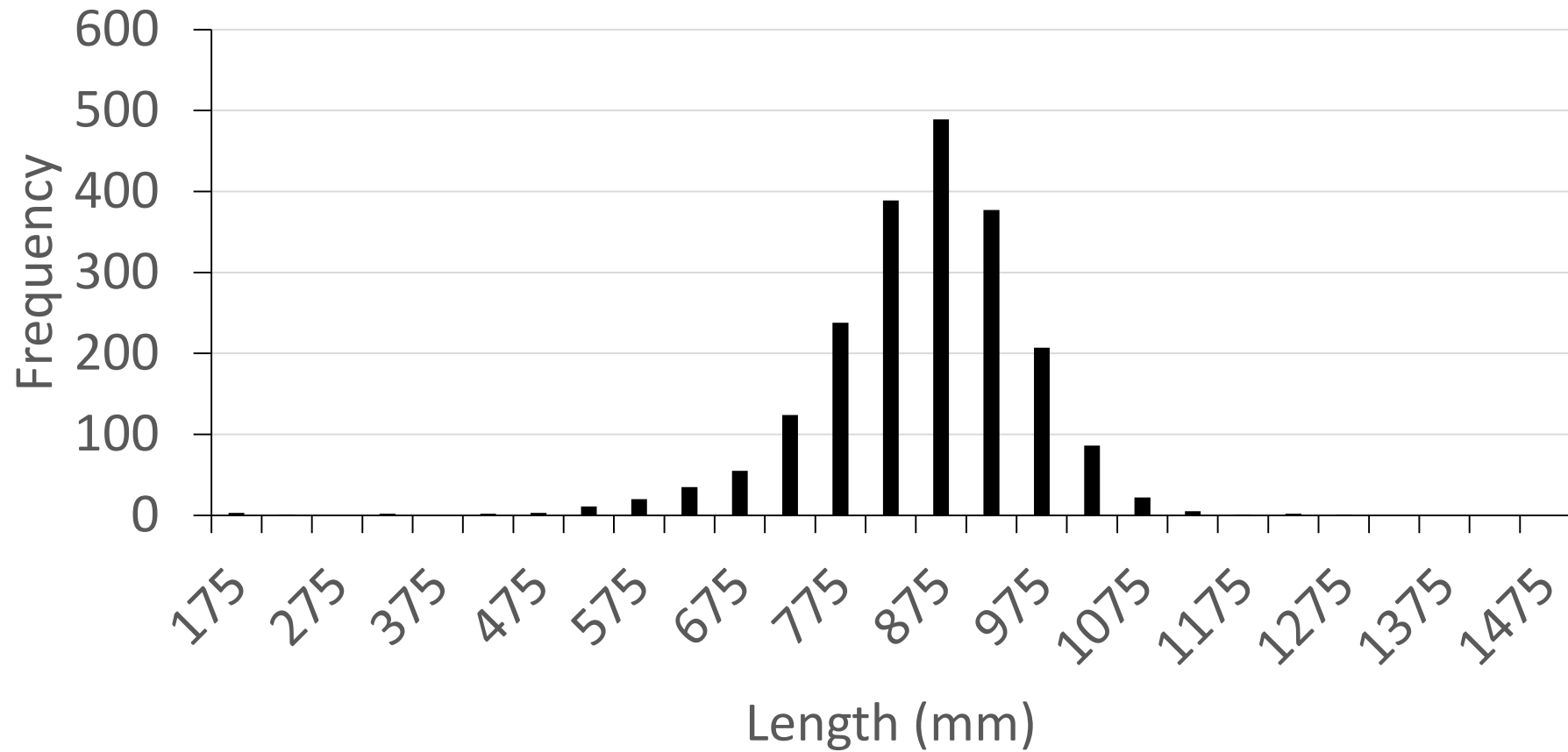
# Combined age composition, Z, and F (assuming $M = 0.093$ Timmons and Hughbanks (2000))

Age	Z	F
10	0.35	0.26
11	0.39	0.30
12	0.43	0.34
13	0.42	0.33
14	0.40	0.31
15	0.36	0.27





# Combined length composition



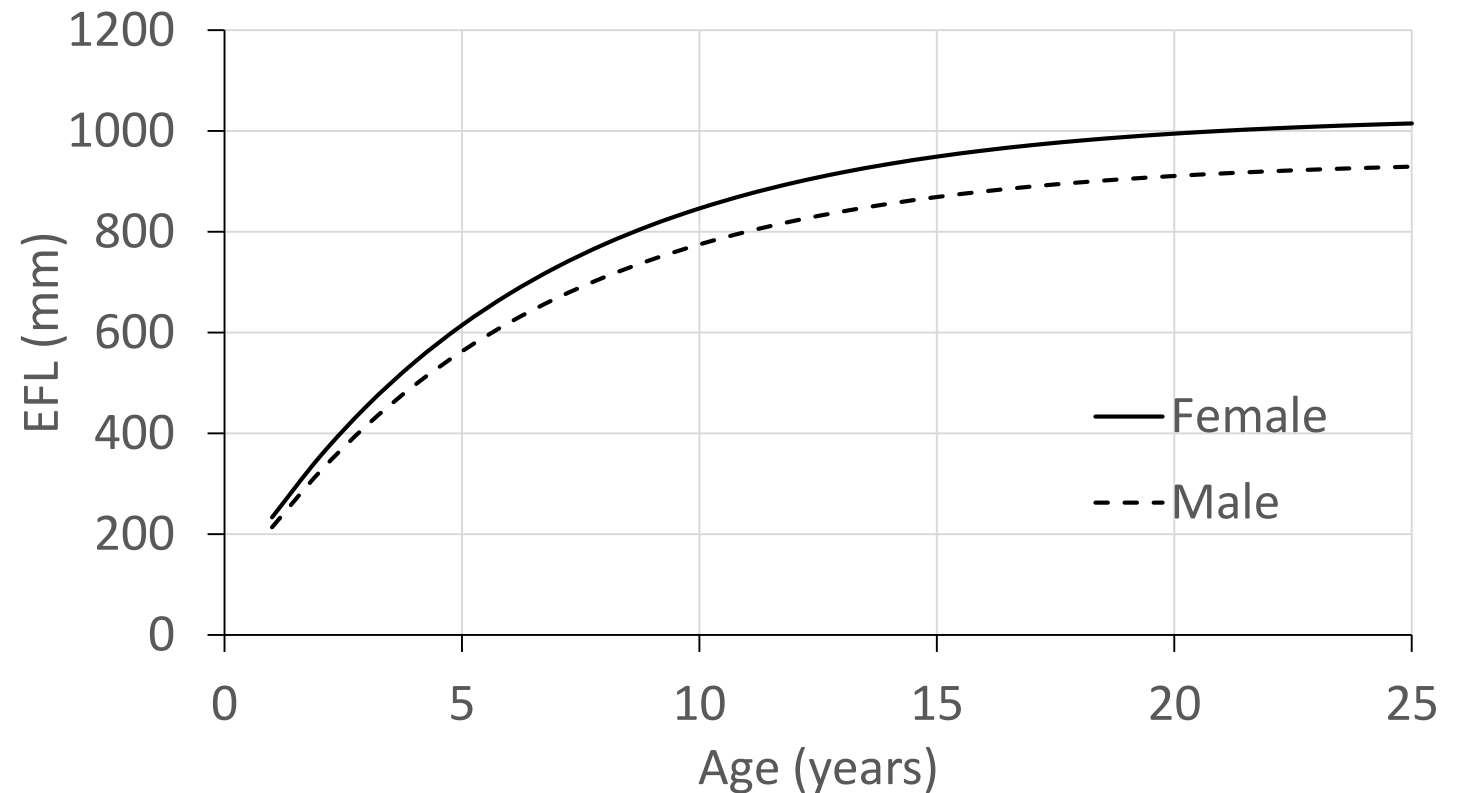
# von Bertalanffy parameters (by sex)

	F	M
$L_{inf}$	1031	944
K	0.16	0.16
$t_0$	-0.58	-0.58

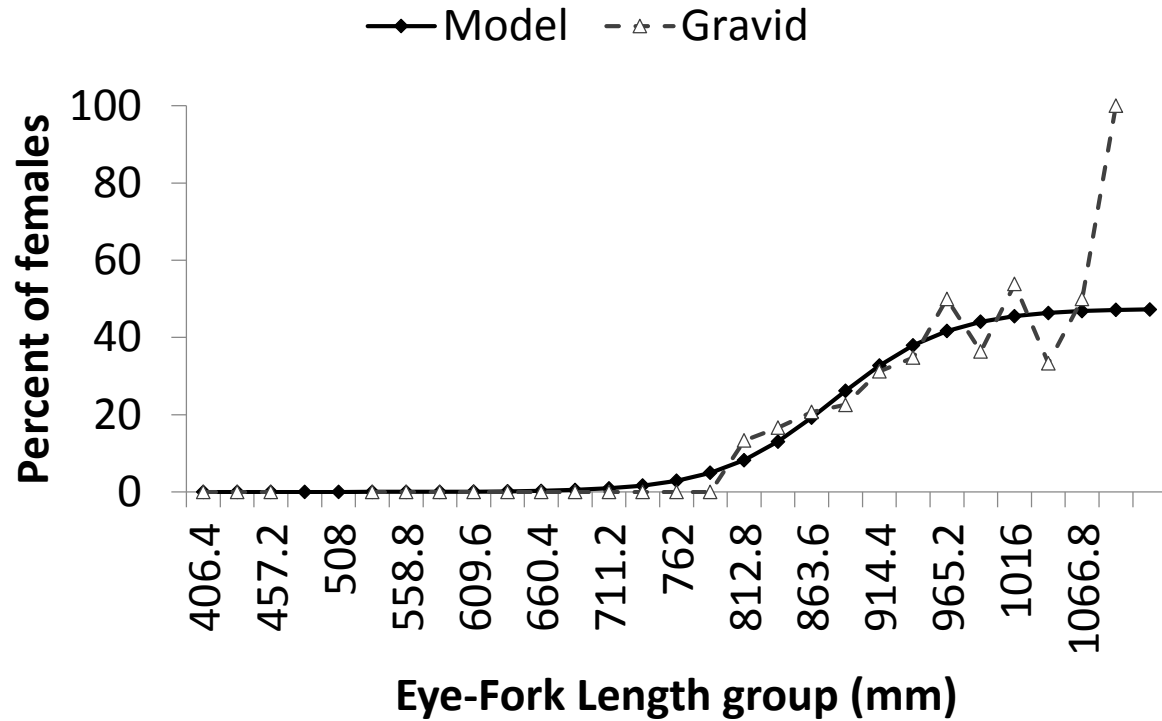
$L_{inf}$  from age 20+ fish

K estimated in selectivity model

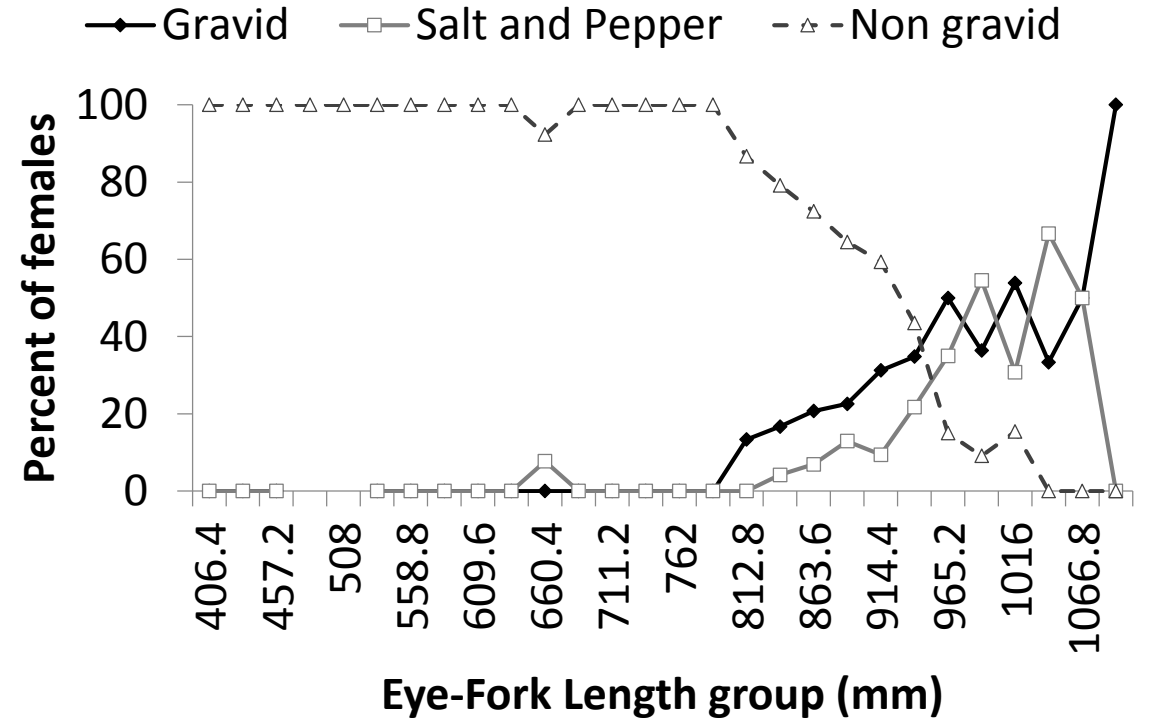
$t_0$  from Sharov and Wilberg report



# Maturity at length



Average female spawns every 2.1 years  
50% mature at 880 mm



# Maturity at age

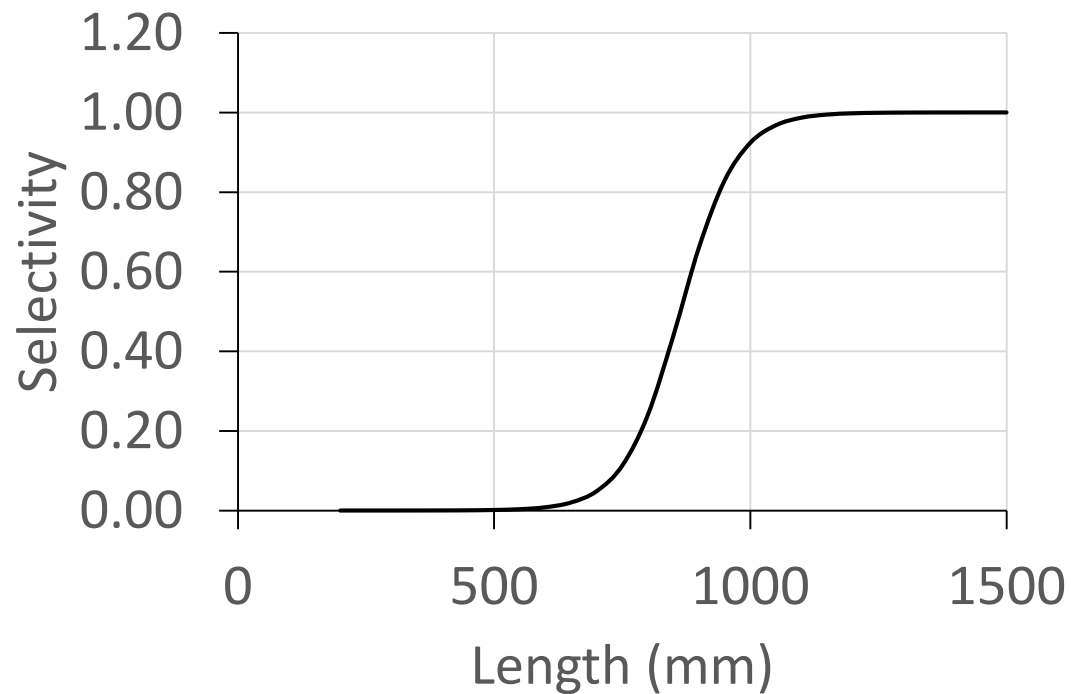
50% mature at age-11



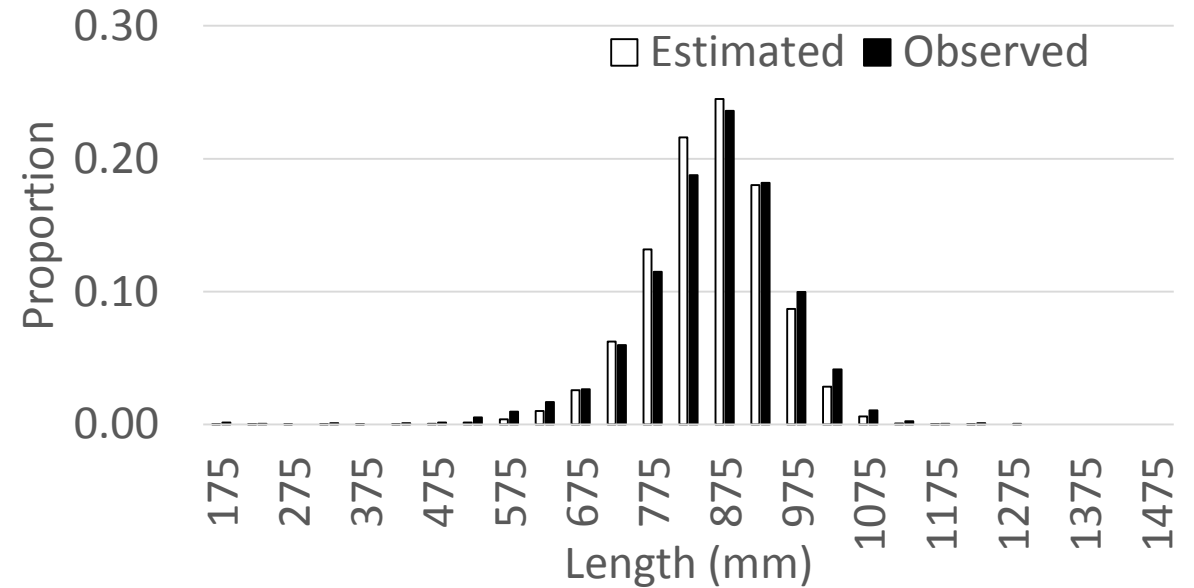
# Selectivity

- Selectivity curve and model fits

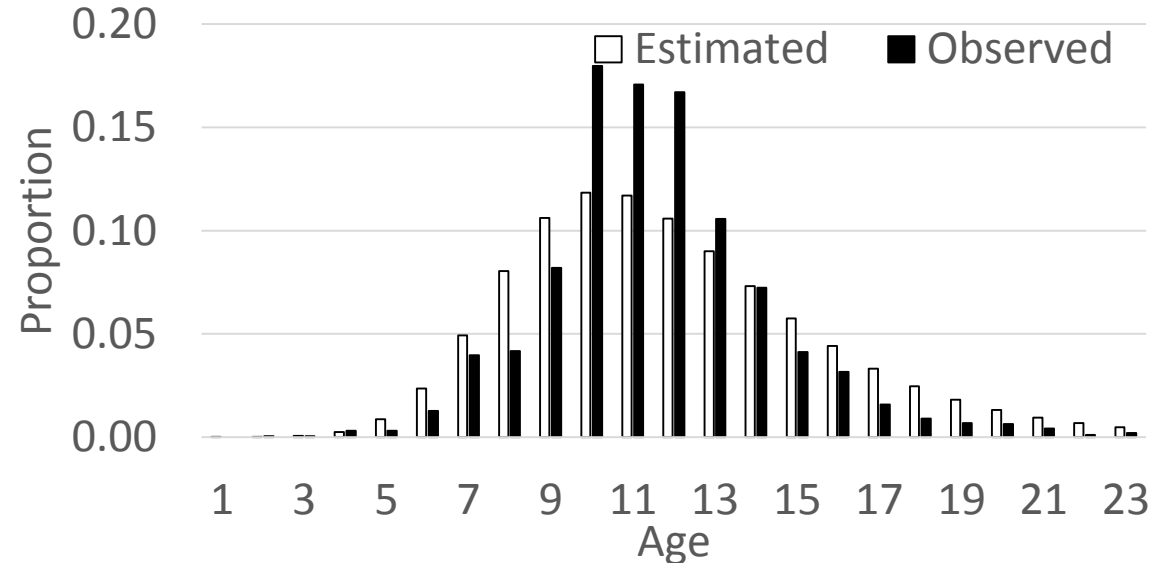
### Selectivity at length



### Length composition

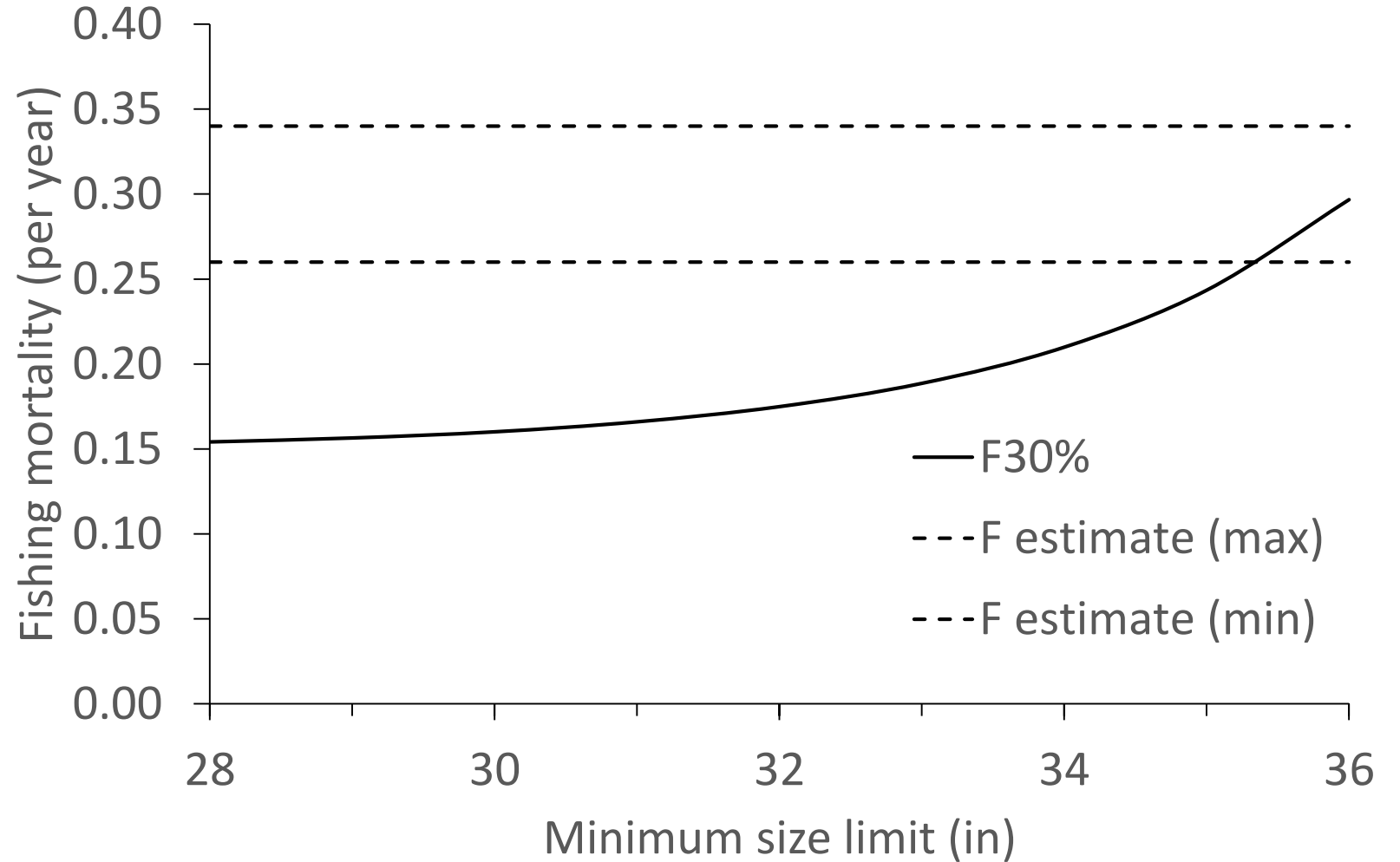


### Age composition



# SPR reference points

Age	Z	F
10	0.35	0.26
11	0.39	0.30
12	0.43	0.34
13	0.42	0.33
14	0.40	0.31
15	0.36	0.27



# Major uncertainties

- Growth parameters hard to estimate (lack of young fish)
- Female maturity at size (and age)
- Natural mortality rate (currently using  $M = 0.093$ ; affects estimated  $F$  and  $F_{30\%}$ )

IOWA

## Iowa MICRA Paddlefish and Sturgeon Committee Meeting Update

### Missouri River:

**PROJECT:** Age-0 Pallid Sturgeon Capture and Detection Probability Evaluation

**USACE CONTRACT#:** W9128F18P0042

**PROJECT LEADER:** Ryan Hupfeld and Jon Christensen

**LOCATION:** Upper Decatur Bend, Decatur, NE- River Mile 692

**PERIOD OF RESEARCH:** April 1, 2018 through September 30, 2018

### INTRODUCTION

Detecting recruitment of juvenile Pallid Sturgeon in the lower Missouri River has been problematic with few fish being captured because of very low numbers of juvenile fish in the system or due to issues related to sampling (e.g., gear efficiency, effort, etc.). Monitoring for recent recruitment is important as the United States Army Corps of Engineers (USACE) implements management actions in order to help obtain the Missouri River Recovery Program's objective of increasing Pallid Sturgeon recruitment to age-1; which has been hypothesized as a life-history bottleneck for the lower Missouri River, in order to avoid jeopardizing the continued existence of Pallid Sturgeon in the Missouri River (Jacobson et al. 2016). Developing a sampling approach that provides the best opportunity for detecting recruitment in the system is critical for detecting survival. Catch (CPUE) or detection rates of wild age-0 and age-1 Pallid Sturgeon are potential metrics for evaluating Pallid Sturgeon recruitment to age-1 and quantifying the capture and/or detection probabilities for young Pallid Sturgeon is key to the development of these metrics. Thus, the objective of this study was to estimate the capture and detection probability of young-of-year (YOY) Pallid Sturgeon in the lower Missouri River.

### METHODS

Hatchery-spawned Pallid Sturgeon raised to a length of ~70 mm- 135 mm were batch tagged at Gavin's Point National Fish Hatchery with different colored elastomers for each phase. Elastomers were injected on the left underside of the snout in a vertical position. For phase 1, fish were stocked into a single inter-dike area in the Missouri River (river mile 692; Figure 1). Four stockings occurred from July 9-12, 2018 with increasing incremental stockings (Table 1). Due to zero catches, stocking during the last day was increased passed the incremental stocking rate to try and improve catch rates. Stockings occurred on the downstream portion of the point bar and were left to disperse throughout the dike area overnight (Figure 2). Twenty-five trawls (OT04; see Welker and Drobish 2017 for a description of the OT04 trawl) were conducted downstream of the point bar the morning after stocking. Trawling was conducted in 5 meters of water or less. A secondary boat conducted trawling below the stocking area to detect dispersal outside the stocking site. For phase 2, fish were stocked into the same dike area on July 18-19, 2018 with an increased stocking rate for day 2 (Table 1). Twenty-five trawls were conducted downstream of the point bar immediately after stocking due to low catch rates during phase 1 and higher than expected river flows (~60-65 kcfs, normal is ~30-35 kcfs). A secondary boat conducted trawling below the stocking area to detect dispersal outside the stocking site. Twenty-five trawls were also conducted the day following stocking within the stocked inter-dike area.



## RESULTS

During phase 1, zero fish were captured within the inter dike area that was stocked. However, the secondary boat was able to capture six of the fish stocked downstream. During phase 2, catch rates increased substantially both days for the first ~8 trawls, but catch rates quickly diminished (Figures 3 and 4). The secondary boat was also able to capture stocked fish downstream almost immediately after stocking, although not as high of numbers were caught as in the inter-dike area that was stocked (Figure 5 and 6). Zero fish were captured the day following stocking. Nebraska Game and Parks collected two; phase 1 stocked fish 48 miles downstream from the original stocking location on July 25, 2018, 12-16 days post stocking.

## DISCUSSION

Based on the results of the study, the gear used appears to be effective at catching age-0 Pallid Sturgeon when they are in the sampling area, even at relatively low densities. Due to higher than normal flows and wing dikes being completely or partially overtopped, it appears the fish were leaving the inter-dike area very quickly so catch rates were low and the number of known individuals remaining within the inter-dike area throughout the study was unknown. Future efforts are suggested to determine if sturgeon retention in the inter-dike area would be sufficient with lower river flows in order to gain insight into gear detection and capture probabilities of age-0 sturgeon.

## LITERATURE CITED

- Jacobson, R.B., M.L. Annis, M.E. Colvin, D.A. James, T.L. Welker, M.J., and Parsley. 2016. Missouri River *Scaphirhynchus albus* (pallid sturgeon) effects analysis—Integrative report 2016: U.S. Geological Survey Scientific Investigations Report 2016–5064. 154 p. <http://dx.doi.org/10.3133/sir20165064>.
- Welker, T. L., and M. R. Drobish (editors). 2017. Missouri River Standard Operating Procedures for Fish Sampling and Data Collection, Volume 1.8. U.S. Army Corps of Engineers, Omaha District, Yankton, SD. 195 p

## TABLES

Phase	Date	# of fish stocked
1	7/9/2018	2
1	7/10/2018	20
1	7/11/2018	200
1	7/12/2018	4,639
2	7/18/2018	200
2	7/19/2018	3,434

Table 1. Stocking rates of age-0 Pallid Sturgeon into the inter-dike area near Decatur, NE.

**FIGURES**

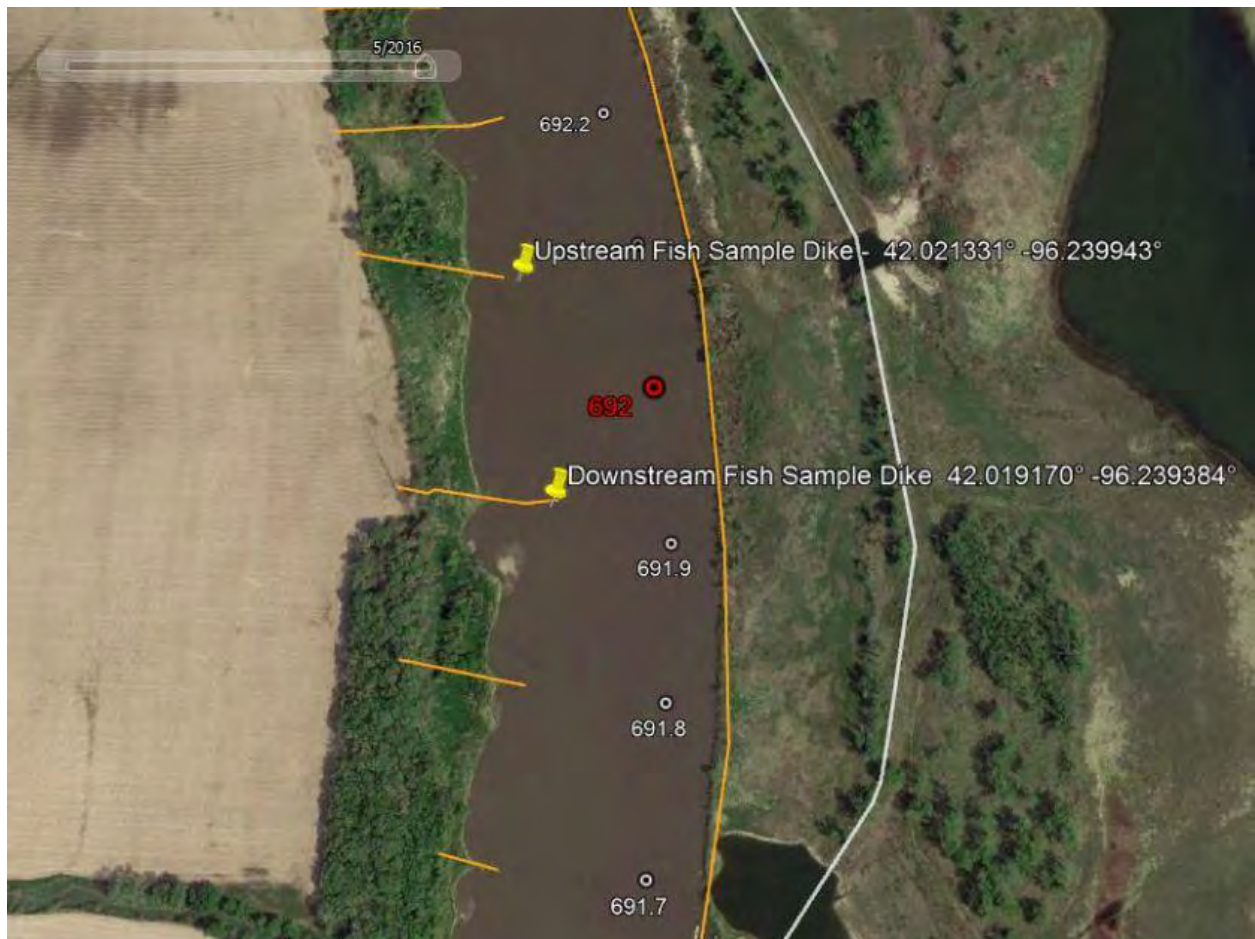


Figure 1. Map of inter-dike area where stocking of age-0 Pallid Sturgeon and intensive trawling occurred.



Figure 2. Detailed image of the inter-dike sampling area. Sampling area is approximately 0.65 acres and only includes the lower yellow section. Fish were stocked at approximately the upper yellow line.

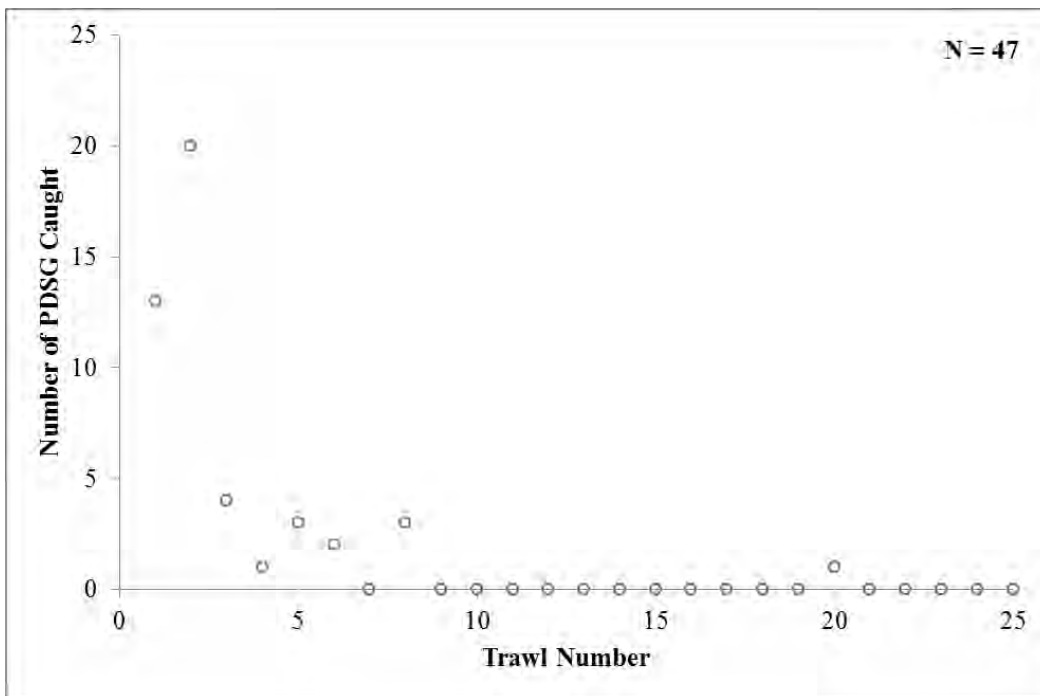


Figure 3. Trawling results from phase 2 on 7/18/2018 within stocked inter-dike area.

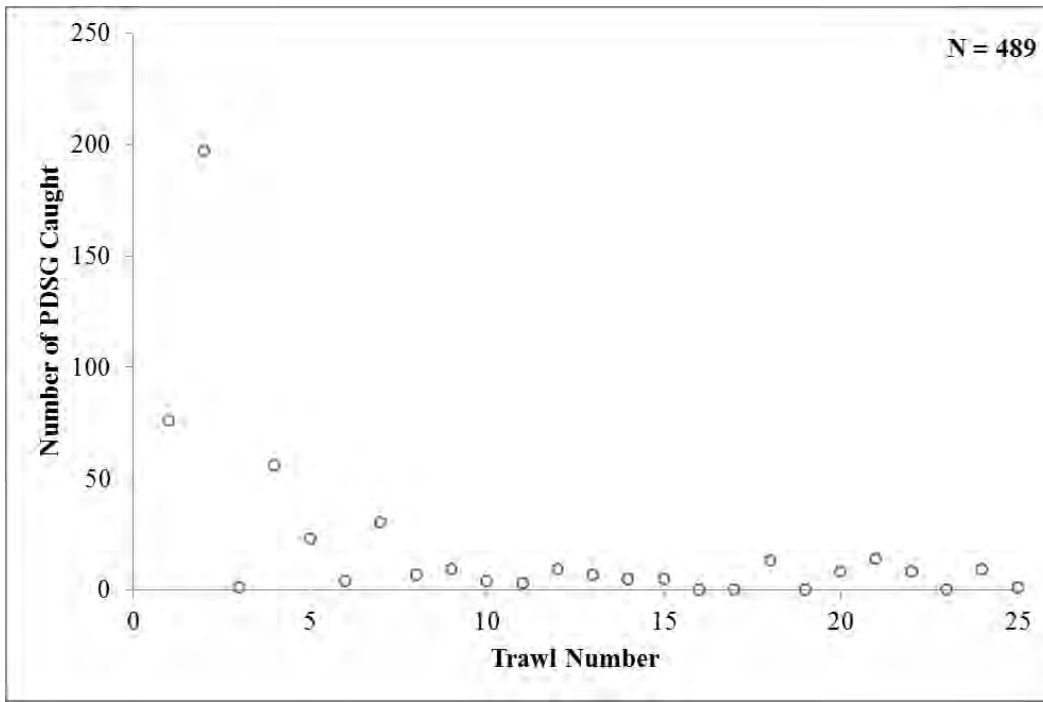


Figure 4. Trawling results from phase 2 on 7/19/2018 within stocked inter-dike area.

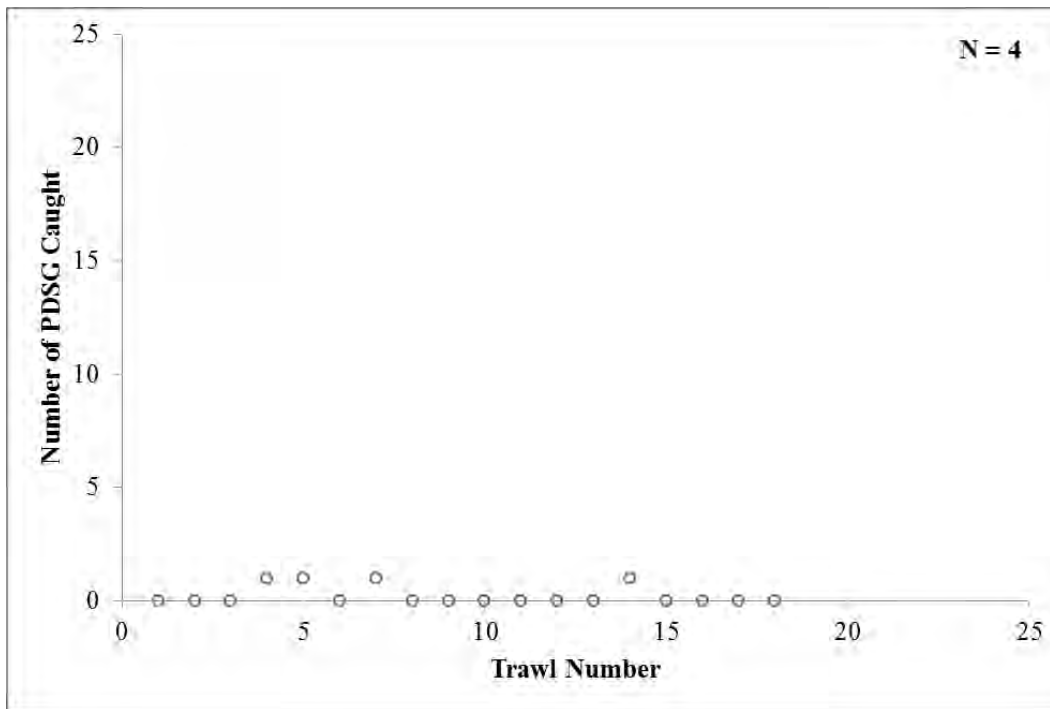


Figure 5. Secondary boat trawling results from phase 2 on 7/18/2018 within stocked inter-dike area.

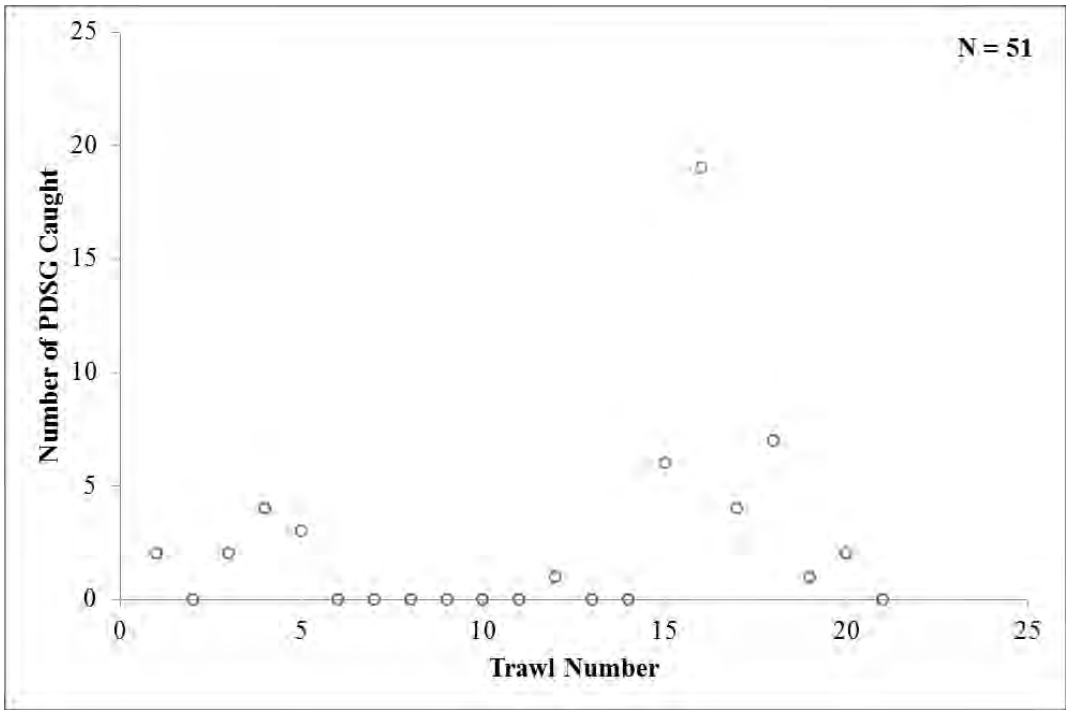


Figure 6. Secondary boat trawling results from phase 2 on 7/19/2018 within stocked inter-dike area.

## Paddlefish:

The Missouri River Paddlefish recreational snagging season in Iowa has declined in popularity and success rate since its reopening in 2015 (Table 1). Survey cards sent out to anglers suggest some of the primary reasons for decline could be: 1) the state regulations/border between Nebraska and Iowa is very confusing and should be more consistent between states (no harvest is currently allowed in the Nebraska waters south of Sioux City), 2) no harvest of Asian Carp was allowed, and 3) season start dates were too late.

New to the 2018 season rules to help increase popularity and success included:

- Anglers can buy up to two tags – one from Dec. 15 to Dec. 31 and an additional tag from Jan. 1 to Jan. 7, or two tags if you didn't buy one in December.
- The season has been extended, opening Feb. 4 and running through April 30.
- Rough fish, including Asian Carp, can be harvested during the paddlefish snagging season.

<b>Paddlefish Survey Card Results</b>				
<b>Year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
# Tags Sold	740	407	336	400
Multitple Tag Purchases				68
# Survey Cards Returned	107	51	61	76
Survey Card Return Rate	0.14	0.13	0.18	0.19
# who snagged for pdfh	95	33	44	55
% who snagged for pdfh	88.79%	64.71%	72.13%	72.37%
# of harvested fish reported	53	10	7	18
Success Rate	55.79%	30.30%	15.91%	32.73%
Avg. Length Harvested (inches)	32	33.25	33	32.6
Max size harvested (inches)	34.75	34.5	34	34.5
# of paddlefish released less than 35"		36	15	28
# of paddlefish released 35-45"		24	8	41
# of paddlefish released larger than 45"		0	3	0
Avg. # of trips	3.8	3.75	3.7	3.4
Did you like the extended season and regulation changes? (% of yes)				100%
Did you like the opportunity to purchase an additional tag? (% of yes)				94%
What time period did you have the most success (Month)?				
% February				33%
% March				57%
% April				9%
Total Estimated # of tag buyers who snagged	657	263	242	289
<b>Total Estimated # of fish harvested</b>	<b>367</b>	<b>80</b>	<b>39</b>	<b>95</b>

Table 1. Missouri River Paddlefish Season returned angler survey card results from 2015-2017.

**STUDY 7047**  
***Assessment of Iowa's Shovelnose Sturgeon sport fisheries***

**OBJECTIVE**

By the year 2019, assess shovelnose sturgeon sampling methods, population dynamics (size structure, age, growth, mortality, spawning periodicity), and movement in Iowa rivers and provide management recommendations.

**APPROACH 1**

**Standard sampling protocols for Shovelnose Sturgeon**

**OBJECTIVE**

Assess different gear types and review pertinent literature to develop a standard sampling protocol for Iowa's Shovelnose Sturgeon fisheries.

**APPROACH 2**

**Evaluate Shovelnose Sturgeon population demographics**

**OBJECTIVE**

Determine size structure, age, growth, mortality, spawning periodicity, and movement of Shovelnose Sturgeon populations in Iowa rivers.

## STUDY 7047 ANNUAL REPORT

**Approach 1: Standard sampling protocols for Shovelnose Sturgeon**

Efficiency and size selectivity of boat electrofishing and drifted trammel netting were assessed on the Cedar River during annual Shovelnose Sturgeon (*Scaphirhynchus platyrhynchus*) sampling 15-24 May 2018. Boat electrofishing has been utilized to sample spawning populations of Shovelnose Sturgeon in similar shallow rivers (Kennedy et al. 2007) and drifted trammel nets are a standard gear for sampling Shovelnose Sturgeon on the upper Mississippi River (Koch et al. 2009). Flooding on the Cedar River in early May forced the rescheduling of sampling. Subsequently electrofishing was only utilized on one day and trawling was not assessed as in previous study segments due to scheduling conflicts.

Boat electrofishing units traveled downstream occasionally varying their speed in relation to current. Output settings varied to maintain operation within the appropriate power goal depending on water conductivity (Miranda 2009). Pedal time was recorded for each electrofishing run. Drifted trammel nets were 100-ft in length by 6-ft deep with ½-inch Foamcore float lines and 30-lb. Leadcore lead lines. Outer wallings were constructed of number 9 multifilament nylon and were 6-ft deep with 12-in bar mesh. Inner wallings were constructed of number 139 multifilament nylon and were 8-ft deep (hobbled to 6-ft) with 2-in bar mesh. Wooden mules were attached to the ends of nets while drifting to pull them downstream and help prevent them from closing. Drifted trammel nets were set perpendicular to flow and allowed to drift downstream. Time and distance of each drift was recorded with a watch and GPS unit. All captured fish were enumerated and measured to the nearest 1-mm fork length (FL), weighed to the nearest gram, and tagged on a pectoral fin with an individually numbered Monel bird wing tag (Model 1000-3). Sex of each fish was recorded as female (flowing eggs or obvious distended abdomen with large black stripe), male (flowing milt), or unknown.

Mean FL of Shovelnose Sturgeon was larger in trammel nets than electrofishing (Figure 1; ANOVA;  $F = 3.85$ ;  $df = 1, 916$ ;  $p < 0.0001$ ). Efficiency of each gear was compared by dividing the number of Shovelnose Sturgeon captured by each gear type by the number of boat days the gear was utilized (i.e. three electrofishing boats sampling for two days = 6 boat days). Electrofishing crews captured 83 more sturgeon on average than trammel netting crews (Table 1). However, electrofishing was only utilized one day and the trammel netting crew captured five more sturgeon than the electrofishing crew on that day (207 vs 202 fish). The percentage of female Shovelnose Sturgeon captured trammel netting was significantly higher than electrofishing (Table 2;  $\chi^2 = 51.6$ ;  $d.f. = 1$ ;  $p < 0.0001$ ).

**Study Recommendations:** Continue with this study as designed.

**Literature Cited:**

- Miranda, L. E. 2009. Standardizing electrofishing power for boat electrofishing. Pages 223-230 in S. A. Bonar, W. A. Hubert, and D. W. Willis, editors. Standard methods for sampling North American freshwater fishes. American Fisheries Society, Bethesda, Maryland.
- Koch, J.D., M.C. Quist, C.L. Pierce, K.A. Hansen, and M.J. Steuck. 2009. Effects of commercial harvest on Shovelnose Sturgeon populations in the upper Mississippi River. North American Journal of Fisheries Management 29:84-100.



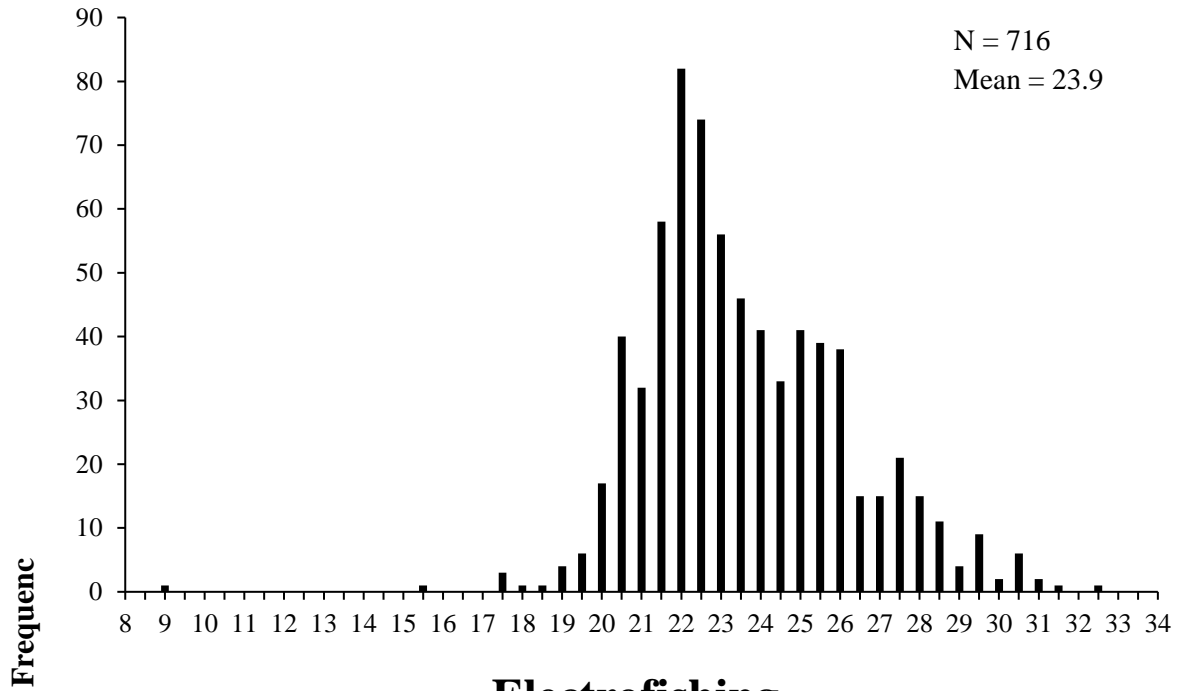
**Table 1. Sample size, mean length (in), standard error, size range, effort, and catch per boat per day of Shovelnose Sturgeon captured via electrofishing, drifted trammel net, and modified (Missouri) trawl on the Cedar River, May 2018.**

Gear	EF	TN
N	202	716
Mean (in)	22.9	23.9
SE	0.16	0.10
Min (in)	16.8	9.1
Max (in)	30.0	32.8
Boat Days	1	6
Catch/day	202	119

**Table 2. Proportion of Shovelnose Sturgeon identified as female or male/unknown sex captured via electrofishing and drifted trammel net on the Cedar River, May 2018.**

Gear	Female	Male/Unknown
Electrofishing	0.20	0.80
Trammel Net	0.48	0.52

# Trammel Net



# Electrofishing

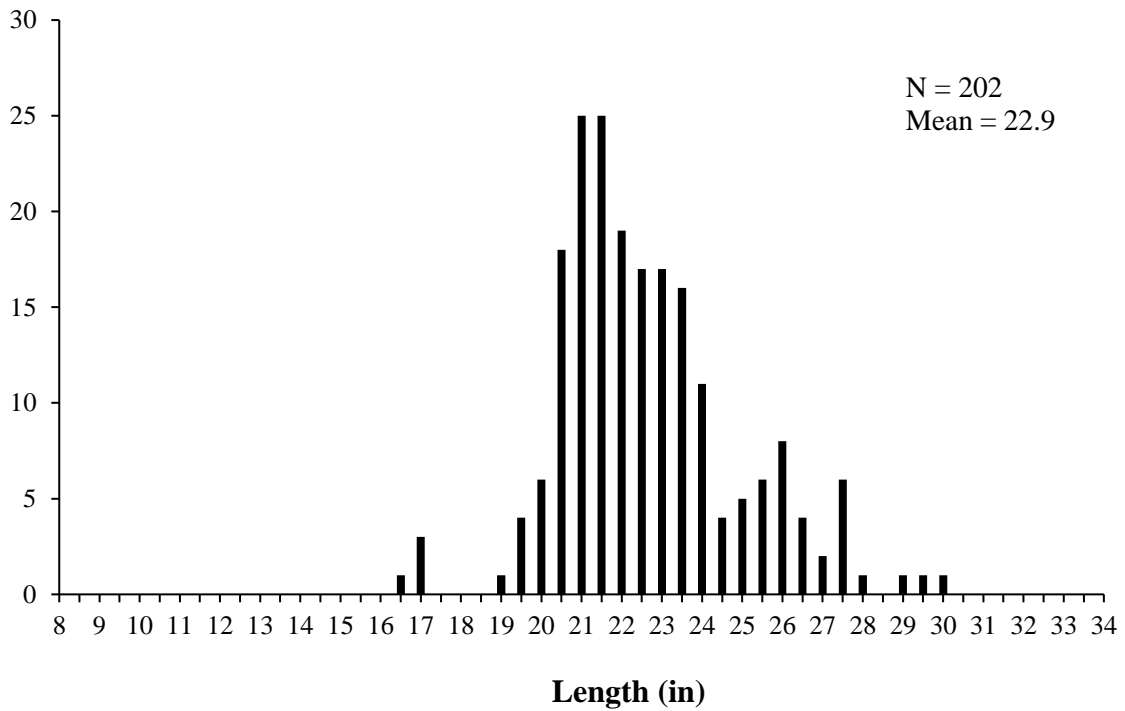


Figure 1. Shovelnose Sturgeon length frequency graphs sampled with boat electrofishing and drifted trammel nets at the Cedar River, May 2018.

## STUDY 7047 ANNUAL REPORT

### Approach 2: Evaluate Shovelnose Sturgeon population demographics

Shovelnose Sturgeon are a long-lived, slow-growing, late maturing fish that does not spawn annually, making them susceptible to overharvest (Quist et al. 2002, Colombo et al. 2007, Koch et al. 2009, Tripp et al. 2009). While spawning periodicity of Shovelnose Sturgeon has been inferred from observations of the proportion of females at various reproductive stages (Tripp et al. 2009b), it has not been directly measured by repeated observations of individual fish.

Spawning periodicity was studied at the Cedar River by measuring years between tagging and recapture for gravid females. To date, 114 gravid female Shovelnose Sturgeon have been recaptured, including 10 in 2018. Peak recoveries occurred at 2, 4, and 6 years at large indicating a two year spawning periodicity (Figure 1). However, high recoveries at years 3 and 5 indicated periodicity was likely variable. Scarnecchia et al. (2007) found spawning periodicity decreased as Paddlefish (*Polyodon spathula*) aged. Spawning periodicity of two years observed in this study on the Cedar River is one year shorter than that inferred from study of gonadal development on the Middle Mississippi River.

**Study Recommendations:** Continue with this study as designed.

### Literature Cited:

- Colombo, R.E., J.E. Garvey, N.D. Jackson, R. Brooks, D.P. Herzog, R.A. Hrabik, and T.W. Spier. 2007. Harvest of Mississippi River sturgeon drives abundance and reproductive success: a harbinger of collapse? *Journal of Applied Ichthyology* 23:444-451.
- Koch, J.D., M.C. Quist, C.L. Pierce, K.A. Hansen, and M.J. Steuck. 2009. Effects of commercial harvest on Shovelnose Sturgeon populations in the upper Mississippi River. *North American Journal of Fisheries Management* 29:84-100.
- Quist, M. C., C. S. Guy, M. S. Pegg, P. J. Braaten, C. L. Pierce, V. H. Travnichek. 2002. Potential influence of harvest on shovelnose sturgeon populations in the Missouri River system. *North American Journal of Fisheries Management* 22:537-549.
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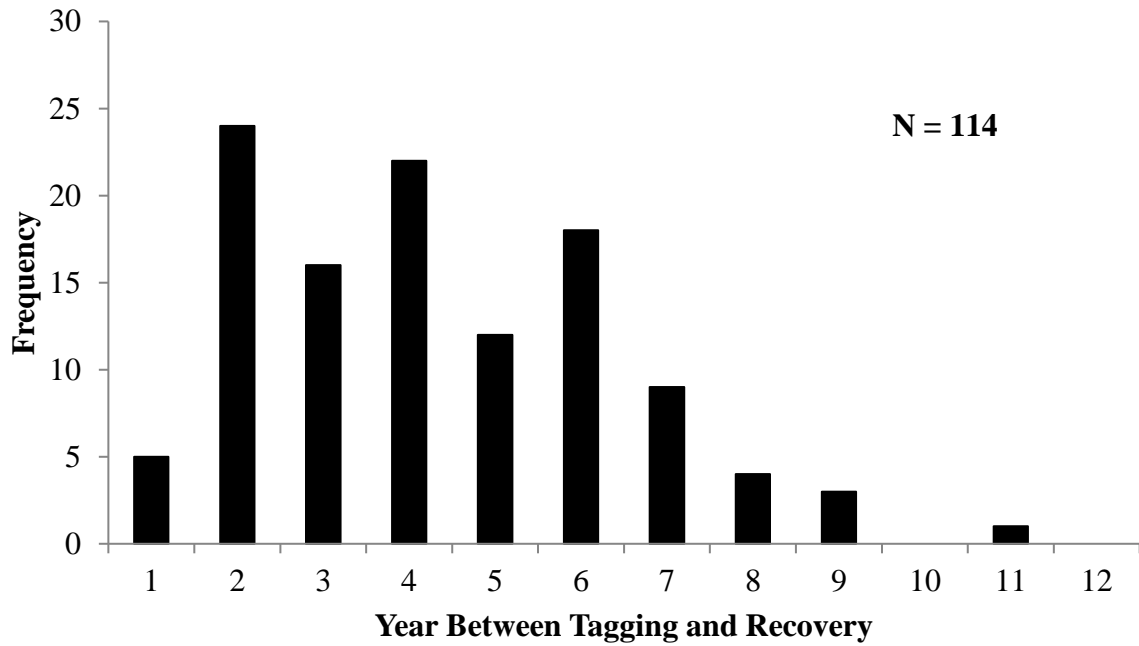


Figure 1. Frequency distribution of years between tagging and recovery of gravid female Shovelnose Sturgeon tagged and recaptured on the Cedar River, Iowa from 2006-2018.

## 2019 MICRA Paddlefish/Sturgeon Committee

Nashville, TN – January 15-16, 2019

### Indiana State Update – Craig Jansen

- 2018 Paddlefish Sampling:
  - o 40 fish were collected from above McAlpine L&D; 57% were female and 13% of the females were F4 (7.5% of entire sample, N = 3). Mean size was 852 mm (33.5 in) at the upstream sites.
  - o 134 fish were collected from below McAlpine L&D; only 1.5% of sample were F4 females (N = 2), one of which was sub-legal (<32 in). Mean size was 810 mm (31.9 in) at the downstream sites.
- 2018 Shovelnose Sturgeon Sampling:
  - o 723 fish were sampled, 663 were floy tagged. 49 fish were recaptures from previous years, including 3 individuals that were at large for 13 years – all 3 fish were within 4 mm of their original length at tagging. Mean length was 25.7 inches for the entire sampled population and 25.9 inches for females.
  - o Mean length continues to decline annually (see figure). Decline in size due to commercial harvest of large, fast growing fish. Recapture data indicates virtually no growth after fish reach maturity.

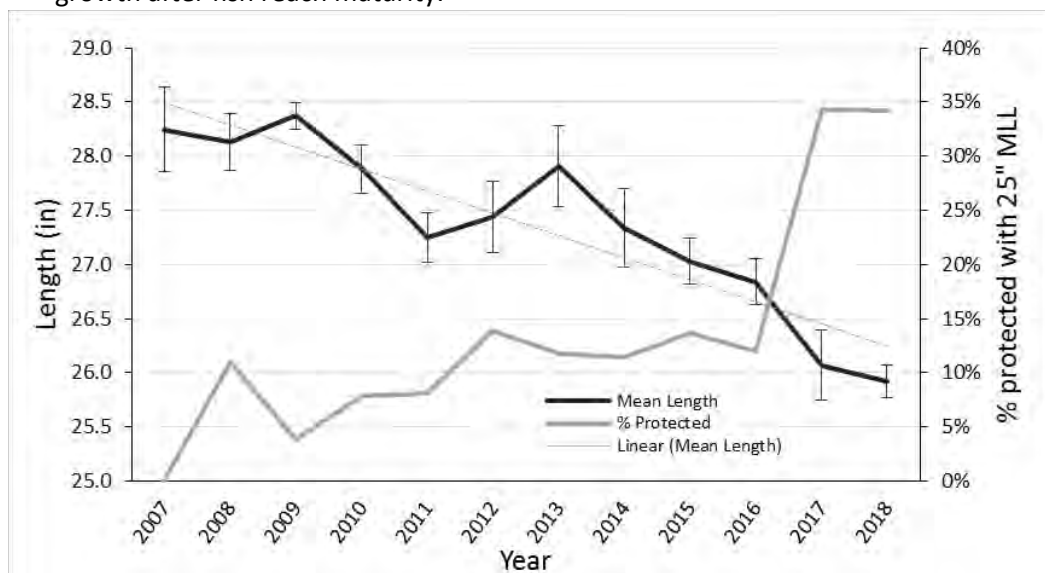


Figure. Confirmed female Shovelnose Sturgeon annual mean length (in  $\pm$  SE) and percent of female (maturity stages F3 to F6) smaller than 25 in sampled by IN DNR biologists in the Wabash River, 2007 to 2018.

- There is currently a regulation proposal to close commercial roe harvest in Indiana. This proposal was prompted by the continual documented declines of the Wabash River sturgeon fishery accompanied with a suspected decline of Ohio River paddlefish, both due to the limited protection for gravid females under current regulations. In addition, the money generated through roe harvester and dealer license sales does not come close to the operational costs

associated with managing those roe fisheries. Indiana did not have a licensed roe harvester for inland water (SNS) in 2017 or 2018, and only had two Ohio River roe harvesters in 2018 (only one reported harvest).

## KANSAS

2018 was a poor year for paddlefish snagging in Kansas as minimal spring runoff made for poor conditions at snag fisheries. Kansas paddlefish management options are fairly limited as our fisheries are mainly dependent on spring migrations from Oklahoma and Missouri populations; however, KDWPT stocks 5,000 paddlefish annually in John Redmond Reservoir, which is an impoundment of the Neosho River in east-central Kansas. These fish are theoretically entrained and contribute to snag fisheries in Kansas and Oklahoma. The fate of these stockings is not well known, but CWT have been obtained from a handful of these fish and we will work with MICRA and ODWC to read these tags and enter them into the database. We plan to obtain jaw bones from snagged paddlefish along the gradient of the Neosho River in 2019 and examine broad-scale movements through dentary microchemistry. Hopefully results are distinct enough to inform managers about entrainment, migration, and stock contribution from these stockings. Sturgeon work in Kansas is limited, and Missouri Department of Conservation continues Missouri River and lower Kansas River sturgeon monitoring for Corps funded projects.

MISSOURI

## **Report to the MICRA Paddlefish and Sturgeon Committee**

**2018**

### **Missouri Department of Conservation (MDC)**

#### **Lake Sturgeon (LKSG)**

##### **Management**

Missouri Department of Conservation (MDC) staff having been working to write the third edition of our lake sturgeon recovery effort. "A Continuing Plan for Recovery and Management of Lake Sturgeon in Missouri" has been reviewed by MDC staff in Fisheries, Resource Science, Protection, and Outreach & Education divisions as well as select sturgeon production and management staff from the USFWS, Wisconsin DNR, and the Pacific Northwest National Laboratory. The current draft of the plan is being reviewed by MDC's Fisheries Administration. This effort is expected to be completed by July, 2019.

In mid-September, 2018, 10,000 fingerling LKSG were stocked into Pools 21 and 24 of the Upper Mississippi River. The fingerlings were raised at Genoa National Fish Hatchery and were tagged with batch coded wire tags prior to stocking. In late-September, 2018, 14,140 fingerling LKSG were tagged with sequential coded wire tags and marked by lateral scute removal at MDC's Lost Valley Hatchery. The fingerlings were stocked into the Osage and Gasconade Rivers, major tributaries to the Missouri River.

One hundred fingerlings were implanted with acoustic, ultrasonic transmitters and held at Lost Valley Hatchery for 11 days. There was minor mortality and/or tag-shedding prior to stocking. The remaining fingerlings were divided into four batches and stocked at two sites on the Osage River (river miles 10 and 50) and two sites on the Gasconade River (river miles 9 and 50). Osage River fingerlings were actively tracked for three days post-stocking and intermittently since. Only the downstream-most 10 miles of the Gasconade River has been actively tracked. Remote receivers placed approximately eight miles apart in each river are also being monitored.

As of early December, all live transmitted fingerlings remain in the tributaries. Many have moved upstream and some have moved over 70 miles upstream. One fingerling from the Gasconade River traveled downstream and entered the Missouri River, traveled 21 miles upstream, and entered the Osage River. Previously-transmitted adult, sub-adult, and juvenile LKSG are also being monitored in these tributaries. Movement between the tributaries has been documented on several occasions. There is some site fidelity within these streams too.

The Missouri River tributaries LKSG project is being led by University of Missouri PhD candidate Michael Moore ([mjmhx5@mail.missouri.edu](mailto:mjmhx5@mail.missouri.edu)). For additional information on Missouri's lake sturgeon recovery and management efforts, contact Travis Moore at 573-248-2530, [travis.moore@mdc.mo.gov](mailto:travis.moore@mdc.mo.gov).



## Culture & Stocking

### Lost Valley Hatchery

- Source and Number of Fish Received
  - o 10,000 sac fry received from Wild Rose Hatchery in Wisconsin on 5/25/18.
  - o 7,649, average 3.79", fingerlings received from Genoa Hatchery, Wisconsin – 7/18/18.
  - o All lake sturgeon were reared in production tanks on well water.
  - o Sac fry were started on hatched brine shrimp cysts and then progressed to frozen bloodworms and frozen brine shrimp for the remainder of the season.
- Produced and Tagged
  - o 14,140 fish wire code tagged and had scoots removed then stocked on 9/26/18.
  - o 98 fish were tagged with telemetry tags then stocked on 10/8/18.
  - o 97 fish were stocked without tags on 10/8/18.
  - o 14,335 fish total were reared and stocked from Lost Valley in 2018
  - o 81% percent survival from fish reared at Lost Valley in 2018
- Stocking Locations and Number Stocked

Production <8"		
Requested Lake Name	# Requested	Total # Stocked
Missouri River - Osage (Mari-Osa) <8	3,334	7,097 f
Missouri River - Gasconade (Rollins Ferry) <8	7,000	7,043 f
Production =>8" (Telemetry Tagged)		
Requested Lake Name	# Requested	Total # Stocked
Missouri River - Gasconade (Fredricksburg) =>8	25	24 f
Missouri River - Osage (Mari-Osa) =>8	100	25 f
Missouri River - Osage (Snellen Property) =>8	25	24 f
Missouri River - Gasconade (Rollins Ferry) =>8	25	25 f
Surplus =>8"		
Requested Lake Name	# Requested	Total # Stocked
Missouri River - Gasconade (Fredricksburg) =>8S	50	44 f

Missouri River - Gasconade (Rollins Ferry) =>8S	50	53 f
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## **Pallid Sturgeon (PDSG)**

### **Culture & Stocking**

Blind Pony Fish Hatchery transported and held no potential PDSG broodstock during the 2018 production year. Due to the concerns of ranavirus it was decided that no fish for the restoration program would come through Blind Pony. No PDSG were stocked from Blind Pony in 2018.

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### **Research**

***Pallid Sturgeon Monitoring:*** The 2018 sampling year in Missouri resulted in 66 pallid sturgeon capture events (44 hatchery, 5 wild, and 17 awaiting genetic confirmation). Sampling resulted in 32 pallid sturgeon captures above the confluence with the Kansas River in Segment 9 and 33 captures below the Kansas River in Segment 10. Also, of note was one wild adult pallid sturgeon captured in the Grand River, 8 miles upstream of the confluence with the Missouri River. In the Missouri River above the confluence with the Kansas River, some individual pallid sturgeon had shown a decline in their condition starting in 2014, but condition trends from MDC sampling have displayed a positive trajectory in subsequent years. Several hypotheses have been suggested for the decline (e.g., possible overstocking, imprecise condition formula, food web issues) but little support for one leading covariate has surfaced.

Broodstock collection efforts in 2018 yielded no wild reproductive pallid sturgeon transported to the hatchery, however, fall of 2017 standard sampling resulted in 4 potential broodstock fish transported to Neosho National Fish Hatchery. Genetic samples were taken on 36 young-of-year sturgeon captured in 2018 otter trawls, however, results on species identification are pending. Overall, there is still insufficient documented recruitment of naturally reproducing pallid sturgeon.

This was the last year of the original version of the Pallid Sturgeon Population Assessment. The current United States Army Corps of Engineer funded Pallid Sturgeon Population Assessment project is undergoing a revamp and version 2.0 (as it is being called) is currently being piloted. The old version was a year-round monitoring with two seasons (sturgeon season and fish community season) based on catch per unit effort to analyze trends and habitat associations of pallid sturgeon and the associated Missouri River fish community. One objective of the new version focuses on more precisely estimating the abundance of pallid sturgeon and increasing pallid sturgeon recruitment to Age-1. Version 2.0 will attempt this through a three-part sampling scheme – 1) Robust mark and recapture for real time population modeling estimates, 2) Telemetry work to track spawning movements and

immigration/emigration, and 3) Larval/YOY benthic trawling to look at recruitment to Age-1. Specifics of the new 2.0 version will be finalized with the upcoming sample seasons as protocols are implemented and tested.

**Segment 11, KS RM 0-52:** In 2018, the thirteenth sampling season (2006-2018) was completed for the Pallid Sturgeon Population Assessment Program in Segment 11, the Kansas River. Sampling occurred, per standard protocol, in three randomly selected river bends, which were located between river miles 1.8 and 11.0. One hatchery origin pallid sturgeon from the 2002 year class was captured during standard sampling using trot lines. Another hatchery origin pallid sturgeon from the 2007 year class was captured during a non-random trot line effort in May. Overall, 22 pallid sturgeon have been captured in the Kansas River since 2007, though no pallid sturgeon have been stocked into that tributary. Hatchery-reared origin pallid sturgeon captured in the Kansas River (n=20) include the following hatchery year classes; 2001 (N=1), 2002 (N=10), 2003 (N=6), 2005 (N=1), 2007 (N=1), and 2008 (N=1). Two young-of-year sturgeon (<170 mm) were collected in the Kansas River in 2017 and were genetically identified as shovelnose sturgeon, but none were collected in 2018. An additional 377 shovelnose sturgeon were also collected in gill nets, otter trawls, and trot lines, but all were juveniles or adults and did not require genetic verification.

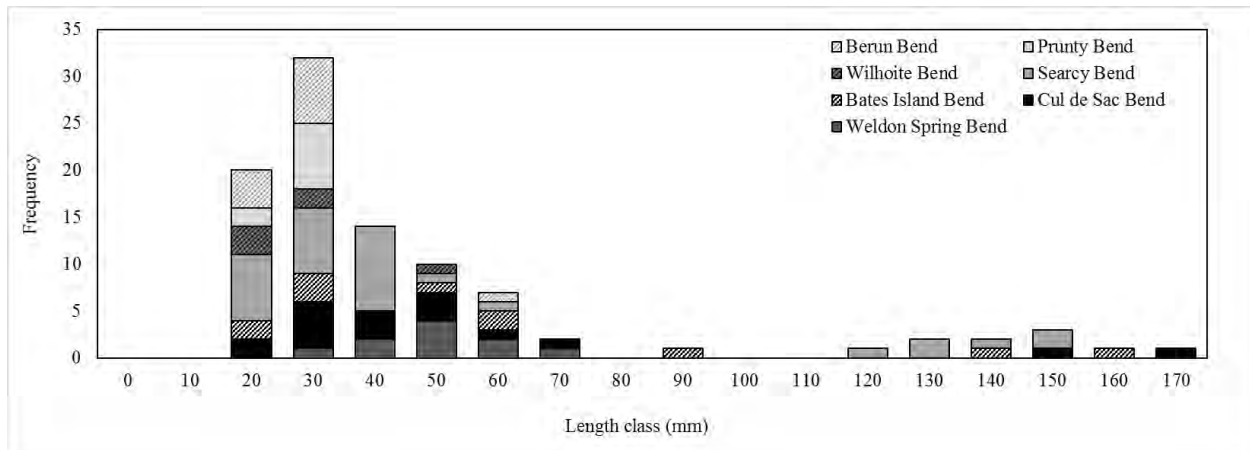
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**Habitat Assessment and Monitoring Program – Interception and Rearing Complexes Evaluation at Searcy Bend:** Missouri Department of Conservation personnel have completed close to 600 trawls at eight bends for the interception and rearing complex study on the lower Missouri River between May and October 2018 using standard sampling protocols outlined in the Missouri River standard Operating Procedures for Fish Sampling and Data Collection version 1.8. Paired treatment-control sites include 1.) Searcy Bend (RM 180.3-Treatment) and Wilhoite Bend (RM 234.4- Control), 2.) Cul de Sac Bend (RM 25.4-Treatment) and Bates Island Bend (RM 94.1- Control), and 3.) Prunty Bend (RM 271.9- Treatment) and Berun Bend (RM 307.3- Control). Two sites- Rocheport Bend (RM 186.9 ) and Boonville Bend (RM 197.2) were dropped during June 2018.

A total of 3993 fish have been collected during 2018, with additional bags of fish being processed and resolved to species-level identification in the lab. Ninety-six unidentified *Scaphirhynchus* sturgeons <170 mm fork length (FL) had been collected by MDC field staff, ranging from 11 mm total length (TL) to 164 mm FL (Fig. 1). Highest abundances of USGs collected during 2018 were at Searcy Bend (N=31).

Variable river discharge between 2016 (pre-channel reconfiguration at Searcy Bend) and 2018 make interpretation of changes in fish community difficult. Higher numbers of USGs have been collected at Searcy Bend during and since channel reconfiguration, but prolonged high water during 2018 may have influenced detection of age-0 sturgeon.



**Figure 1.. Length frequency of unidentified *Scaphirhynchus sturgeons* (USGs) collected from six sites on the lower Missouri River using standard random sampling between May and October 2018. Individuals >50 mm total length (TL) were measured to the fork of the caudal fin.**

Contact Information:

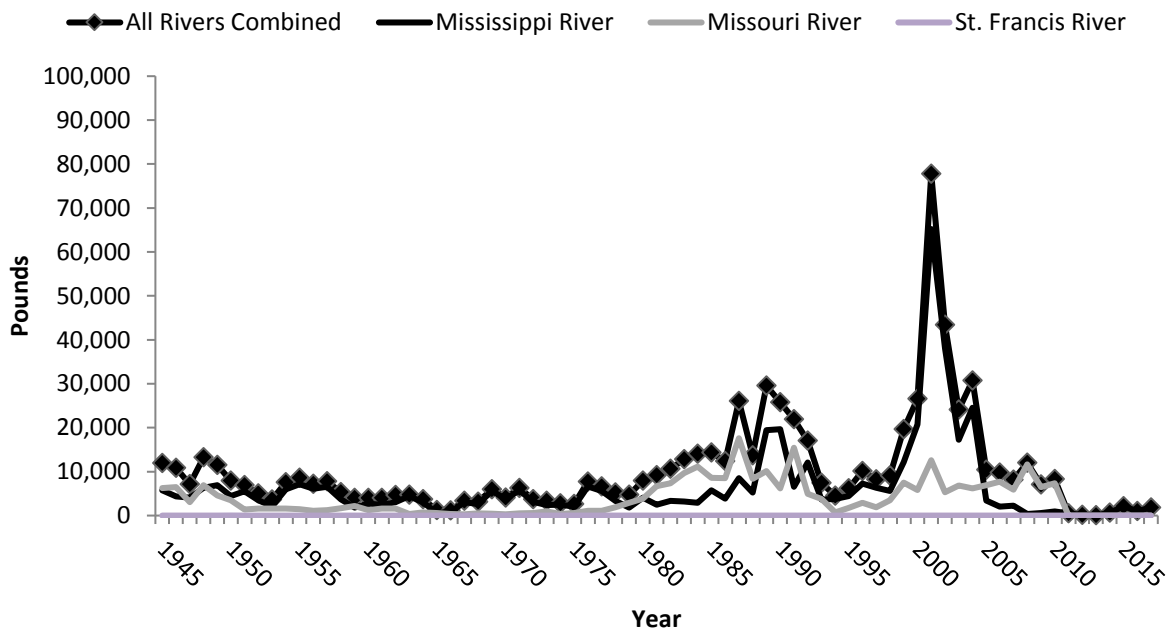
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## **Shovelnose Sturgeon (SNSG)**

### **Commercial Fishing Program**

Upper Mississippi River shovelnose sturgeon harvest increased from 1,045 lbs. in 2016 to 1,849 lbs. in 2017, which consisted of 534 fish (average weight 3.5 lbs.), produced 286 lbs. of roe, and was highest from Pool 26 (1,532 lbs.). Harvest was primarily with trammel nets (896 lbs.) and gill nets (644 lbs.). In 2017, the average, live-weight, wholesale price paid for shovelnose sturgeon flesh was \$0.30/lb.; roe sold for \$58.36/lb. The 2017 shovelnose sturgeon harvest was valued at \$17,245.66 (\$554.70 in flesh and \$16,690.96 in roe).

## **Sturgeons**



Literature Available: *Missouri Commercial Fish Harvest Report 2017*

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## **Paddlefish (PDFH)**

### **Management**

**Reservoir Snag Fisheries:** The 2018 snagging season was a good, despite fluctuating flows and snow and sleet that kept water temperatures lower than normal. Snaggers had good luck on the three reservoirs (Lake of the Ozarks, Harry S. Truman Lake and Table Rock Lake) and we're continuing to see snaggers out on the Mississippi and Missouri rivers and some of their tributaries. The 2019 snagging season should be good. The extremely large 2008-year class of fish is now 11 years old, and will continue to provide good numbers of fish for snaggers to harvest.

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### **Culture & Stocking**

#### **Blind Pony Fish Hatchery:**

- Broodstock:
  - o 7 females collected from Table Rock Lake
  - o 7 males collected from Table Rock Lake
  - o 13 females collected from Harry S. Truman Lake
  - o 13 males collected from Harry S. Truman Lake
  - o 11 males collected from Osage River
  - o 5 females collected from Osage River
- Spawn:
  - o Sperm was collected from 7 males. 16 males did not produce viable gametes. We later determined they were immature females with the use of an ultrasound. We are aiming to reduce the capture of immature females in the future with the use of the ultrasound during collection.
  - o Sperm was ranked by appearance, relative density, %activate, and forward motility and given a score to determine grade, if score was too low sperm was not used
  - o Eggs were collected from 14 females. 3 of the females produced eggs but no fry.
  - o One pan of eggs was fertilized with one male. The amount of sperm to be used on the eggs was based on weight of eggs and determined by using a chart from the USGS that they use for pallid sturgeon spawning. The sperm was activated with a determined amount of water (from the chart) prior to being poured over the eggs for fertilization. However, one male was used for multiple females due to a lack of producing males.
    - 2,576,756 eggs were collected
    - 630,073 hatched
    - 25% Hatch
- Production:

- Ponds 26-32, 38 used for production.
- Ponds 26-28, 32-38 stocked at 50,000/acre
- Ponds 29-31 stocked at 56,000/acre
- 630,073 fry were stocked into Blind Pony ponds.
- Harvest:
  - 74,061 fish harvested
  - 11.75% survival
  - 24,845 Lake of the Ozarks
  - 31,975 Harry S. Truman Lake
  - 16,515 Table Rock Lake
  - 556 Black River
  - 170 USGS - Columbia Environmental Research Center
- Pond Prep/Maintenance:
  - Ponds were started filling 2 weeks prior to expected stocking.
  - Ponds were fertilized with cottonseed meal and alfalfa meal.
  - Aquashade (Mirage) was used to help minimize the growth of vegetation.

Literature Available: *2018 Paddlefish Production and Stocking Report*

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**Research**

**Black River Paddlefish Monitoring:** The Black River downstream of Clearwater Dam supports a significant PDFH sport fishery. Trammel nets and angler use surveys in the large pool below Clearwater Dam have been used to monitor the fishery since 1994. Exploitation rates are calculated assuming 20% non-compliance and zero tag loss. Over the past four years, exploitation has ranged between 15 and 28%.

<b>Black River</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
New jaw tagged fish =	94	32	83	48		
Number harvested =	22	4	17	7		
20% non-reporting	26.4	4.8	20.4	8.4		
<b>Est. Exploitation</b>	<b>28.1</b>	<b>15.0</b>	<b>24.6</b>	<b>17.5</b>		

PDFH movement in the Black River is substantial. In December 2016, 24 acoustic tags were implanted in PDFH captured just downstream of Clearwater Dam. Acoustic tags from harvested PDFH (n=9) were implanted back into additional PDFH at this same location. Of the 33 acoustically tagged paddlefish, 12 (36%) have been located at least once more than 30 river miles downstream of the original tagging location. Five individuals have been located at least once more than 100 river miles downstream from the original tagging location.

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**Statewide Paddlefish Reproduction and Exploitation in Missouri's Large Rivers and Reservoirs:** We have completed the fourth year of the five-year study and started tagging for the fifth year.

*Jaw Tagging & Exploitation:*

Location	Year 1		Year 2		Year 3		Year 4	
	Tagged	Returned	Tagged	Returned	Tagged	Returned	Tagged	Returned
Table Rock	644	58	841	80	487	160	763	166
Truman	1269	129	263	90	626	130	586	214
Lake of the Ozarks	555	29	804	61	436	123	714	122
Mississippi River	300	19	307	26	275	21	732	24

Location	Total			Overall Jaw Band	Transmitter	Non-Reporting
	Tagged	Returned	Harvested	Exploitation	Exploitation	Estimate
Table Rock	2735	464	272	10%	14%	5%
Truman	2744	563	275	10%	11%	5%
Lake of the Ozarks	2509	335	187	7%	5%	9%
Mississippi River	1614	90	62	4%	4%	7%

\*Year-1 – 2015; Year-2 – 2016; Year-3 – 2017; Year -4 – 2018

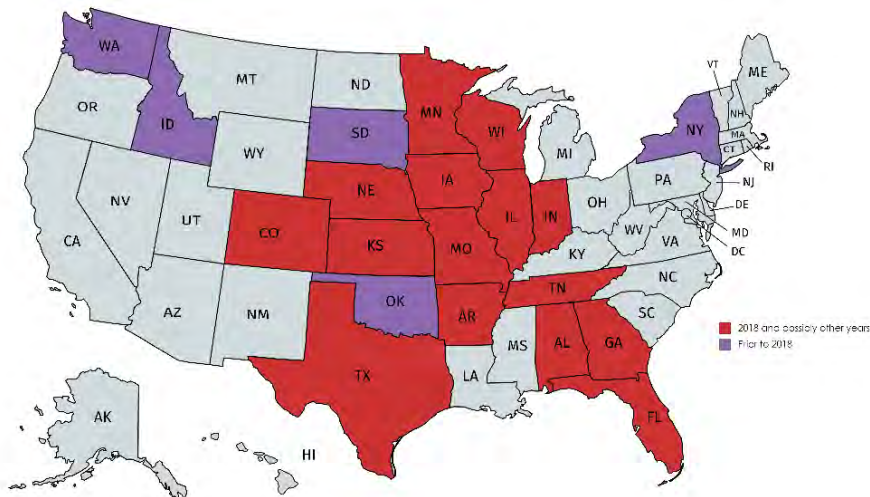
\*Exploitation and non-reporting estimates from transmitters are an average estimate from the three years of data.



*Mississippi River Jaw Band Returns*

License State	Commercial	Recreational	Grand Total
Arkansas	5		5
Illinois	10	8	18
Indiana		2	2
Kentucky	18	7	25
Louisiana	1		1
Missouri	7	15	22
Mississippi	3		3
Nebraska		1	1
Tennessee	9		9
Wisconsin		1	1
<b>Total Caught</b>	53	34	87 *
<b>Total Harvested</b>	36	26	62

\*Three were caught by state or federal agencies



**Reservoir Jaw Band Returns**

\*Red states are ones where a person who snagged a paddlefish tagged in one of the reservoirs had a license during 2018 and the purple states are additional states where people who snagged paddlefish in previous years held licenses.

In 2018 we continued to track and monitor the movement of implanted PDFH with stationary receivers in the Mississippi River (102), Black River (25), St. Francis River (25), Lake of the Ozarks (100), Truman (100) and Table Rock Lake (100).

The transmitter fish have served a dual purpose: 1) measure of non-reporting and 2) track reproductive movement patterns. We documented successful reproduction in the Mississippi River again in year 4. We did not focus on finding reproduction on the reservoirs this year.

### *Movement Information:*

#### Reservoirs

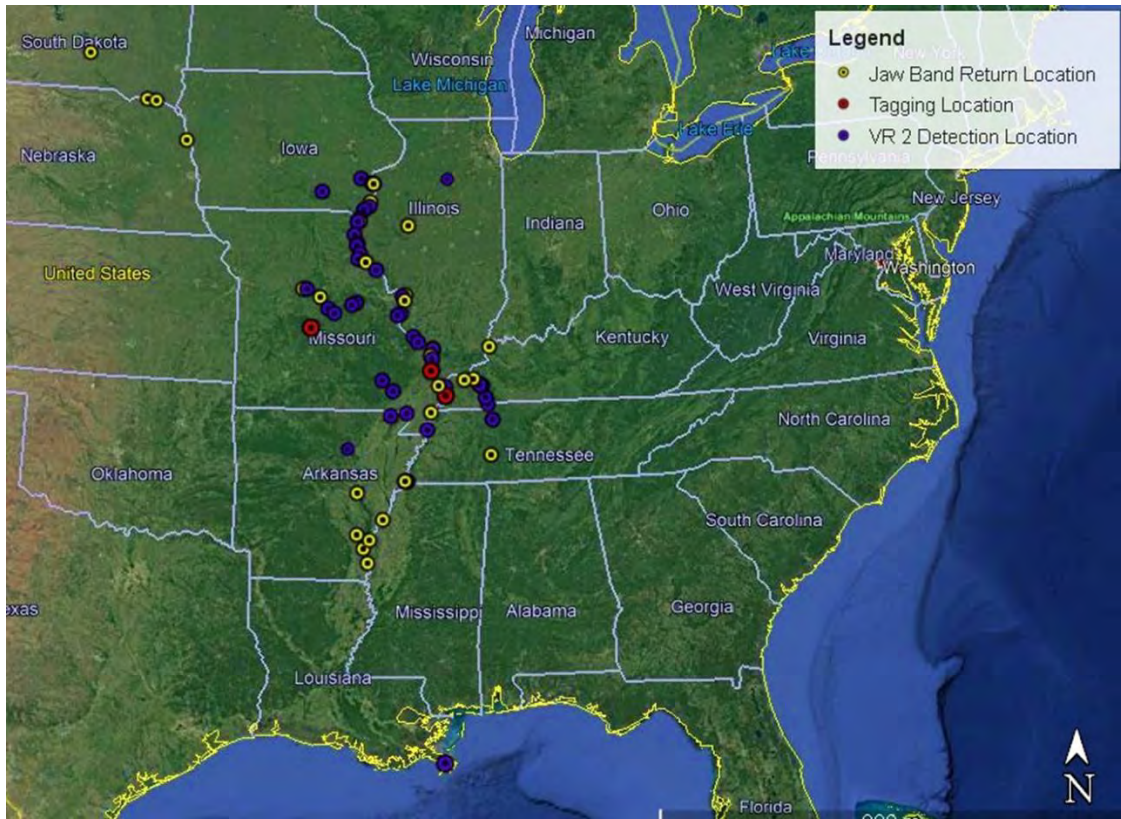
- Truman Lake
  - o Fish were caught by anglers on the Marais des Cygnes River below Osawatomie Dam KS.
  - o Fish passed through Truman Dam and were detected in Lake of the Ozarks and Bagnell Dam and were detected in the Osage River.
  - o Fish were snagged by anglers below Gavins Point Dam.
- Lake of the Ozarks
  - o Fish passed through Bagnell Dam and was snagged below Clinton Dam near Lawrence, KS on the Wakarusa River (tributary to Kansas River).
  - o Others passed through Bagnell and were caught below Gavins Point Dam or were detected on stationary receivers throughout the Mississippi and Missouri River Basin.
- Table Rock
  - o Fish snagged below Bull Shoals Power Site Dam in Forsyth, MO.

Not only have jaw banded fish been detected outside of the reservoirs, but also 10 of the fish tagged with transmitters in Lake of the Ozarks and 1 tagged in Truman have been detected outside of the reservoirs (i.e., Osage, Missouri, Mississippi, Illinois, and Kaskaskia Rivers)

#### Mississippi River

- 552 river miles – Tagged near Cape Girardeau, MO, swam down the Mississippi River, up the White River, AR, up the Cache River, AR, and caught/released near Fredonia, AR.
- 519 river miles – Tagged near Cape Girardeau, MO, swam this distance downstream over a two month period before being harvested in Northern Louisiana.
- ~438 river miles – Three PDFH, all implanted in different locations, swam ~218 miles up the Mississippi River, 220 miles up the Illinois River, and detected at Starved Rock Lock and Dam in Illinois by the USFWS. One of those PDFH then swam back to the Mississippi River and was detected again just below the confluence of the Des Moines River near Keokuk, Iowa; an additional distance of 366 miles, totaling at least 804 river miles.
- 393 river miles – Two PDFH, implanted downstream of Thebes, IL swam 196 miles up the Mississippi River, 197 miles up the Missouri River, and detected at Boonville, MO.

- Almost 2000 miles – one PDFH tagged near the mouth of the Ohio River was detected near Mississippi River mile 3 in the Delta National Wildlife Refuge stationary receiver array and then detected again back at the mouth of the Ohio River.
- 32 tagged or implanted PDFH were recaptured or detected in the Ohio River or tributaries of the Ohio River (i.e., Tennessee and Cumberland River).



Information Link: <https://huntfish.mdc.mo.gov/fishing/protect-missouri-fishing/help-improve-paddlefishing>

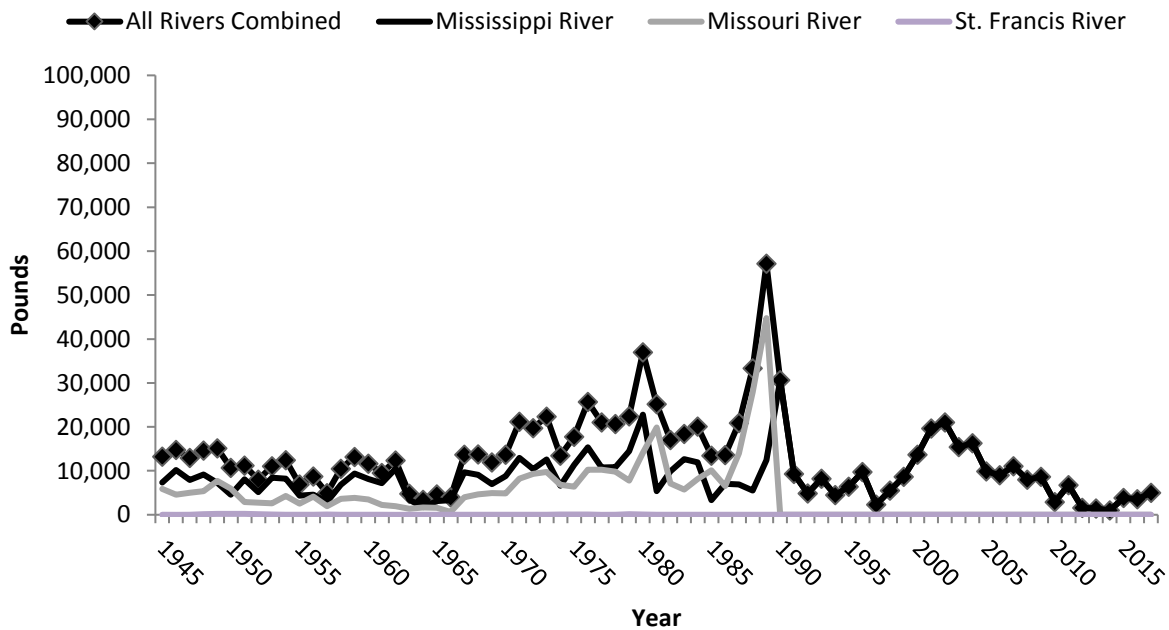
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## Commercial Fishing Program

Mississippi River paddlefish harvest increased from 3,567 lbs. in 2016 to 5,042 lbs. in 2017, which consisted of 234 fish (average weight 21.5 lbs./fish) and produced 448 lbs. of roe. Paddlefish harvest was highest on the LMR (3,847 lbs.), more specifically RM 828-878 (3,640 lbs.) near the Arkansas border. Harvest was primarily with gill nets (3,993 lbs.). In 2017, the average, live-weight, wholesale price paid for paddlefish flesh was \$0.30/lb.; roe sold for \$51.11/lb. The 2017 paddlefish harvest was valued at \$24,409.88 (\$1,512.60 in flesh and \$22,897.28 in roe).

## Paddlefish



Literature Available: *Missouri Commercial Fish Harvest Report 2017*

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## NEBRASKA

### 2019 MICRA Paddlefish and Sturgeon Committee Update

Nebraska Game and Parks Commission

Gerald Mestl

Adult Paddlefish – Very limited sampling was done in 2018 due to lack of personnel and higher than normal water releases in the system throughout the year. Approximately 20 adult paddlefish were sampled and tagged in the Gavins Point Dam Tailwater near Yankton, South Dakota.

Age 0 Paddlefish – Age 0 paddlefish were sampled in Lewis and Clark Lake, the lower most reservoir on the Missouri River using a otter trawl from late June through late July. Paddlefish reproduction was documented and the mean catch was below the long-term mean. Of special note was the presence of a number of Northern Pike in the samples, which had never been documented before.

Paddlefish Book – Time was spent throughout the year working on the sport fishing / management chapter for the symposium proceedings.

Pallid and Shovelnose Sturgeon – Sampling was conducted for three separate Pallid Sturgeon monitoring projects. Trot lining and trawling was conducted at part of the Missouri River basin-wide Pallid Sturgeon Population Assessment Project. Catch, which had declined significantly several years ago, remained low. Condition (K) of the Pallid Sturgeon population, which had dropped significantly several years ago, increased. It is unknown if this increase is an artifact of mortality of the fish in the lowest condition. A major trawling effort was conducted targeting age-0 sturgeon being intercepted into various habitats adjacent to the main channel. Several locations were identified with much higher catches than most will be the focus of studies in 2019. Questions in 2019 will be related to interception of drifting larvae into these sites and subsequently retention and growth in the various habitats. Finally, extensive work was done recapturing previously telemetered Pallid Sturgeon and replacing dying batteries. Pallid Sturgeon efforts on the Missouri River transitioned to a new management plan with new sampling objectives beginning in the fall of 2018. This transition will be fully implemented over the next couple of years.

Paddlefish Archery Season – Despite above normal releases of high water during June, Nebraska Paddlefish archers harvested the most Paddlefish ever during our one-month season. It was estimated that a total of 212 Paddlefish were harvested, which included an estimated 136 fish from our 35 inch to 45 inch protected slot during the snagging season. The archers responded to the gates at Gavins Point Dam being open by shifting much of their effort downstream to the open river. The total number of angler hours estimated for the season and the mean number of hours per angler were the lowest since the first year with similar regulations in 1997. Conversely the harvest rate of 6.5 fish per one hundred

hours of fishing was the second highest ever reported. There are concerns about the number of slot fish that were harvested and if this is sustainable long-term.

Paddlefish Snagging Season – The gates at Gavins Point Dam were also open throughout the October snagging season. The harvest, 420 fish, was the second lowest ever reported since 1997, despite snaggers expending the most effort ever. Snaggers expended 14.7 hours per angler (long-term mean 10.1 hours) and over 21,000 hours (long-term mean 13,500 hours) and had the lowest harvest rate ever reported, 2.0 Paddlefish per 100 hours (long-term mean 6.5). Unlike the archery anglers, the snaggers did not shift additional effort to the open river. The number of Paddlefish released 4,000, was down dramatically from the 13,000-15,000 released each of the previous three years.

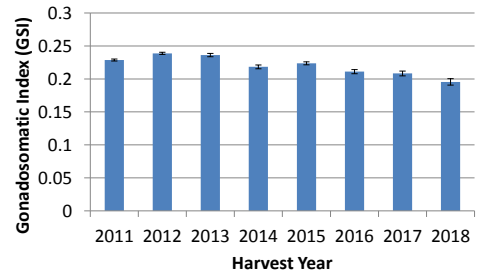
# OKLAHOMA

## MICRA Paddlefish and Sturgeon Committee – January 2019 OK State Report - Oklahoma Department of Wildlife Conservation

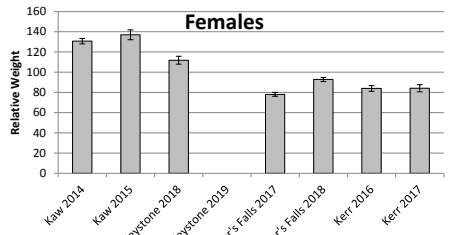
- 1) Paddlefish Collections
  - a) Winter Netting 2018
    - i) Webber’s Falls – mark/recap effort, fish condition was noticeably better than 2017
    - ii) Keystone – large fish, gaining reputation as a trophy destination (135.5lbs)
    - iii) Grand Lake – indicators of strong cohorts in 2015-17, fewer large fish?



- 2) Angler harvest – Spring 2018
  - a) 1,392 fish were checked in at the Paddlefish Research Center (PRC)
    - i) Lowest harvest in program history
    - ii) Spring flows were not conducive to spawning
    - iii) However, angler satisfaction was still high
  - b) Caviar – the PRC produced 3,758.8 lbs of caviar, average 7.3 lbs per female
    - i) Production was down from 2017
    - ii) GSI for females continued to decline (younger fish)
    - iii) Caviar market increasingly dominated by inexpensive Chinese imports



- 3) Harvest Management
  - a) New electronic permits preclude written record of game on permit
- 4) Current Research 2018
  - a) A harvest/angler creel was conducted at Fort Gibson Dam to investigate angler demographics, harvest, and release mortality
    - i) The study was hampered by low water conditions
  - b) Collaboration with King’s College in London, U.K. investigating natural sunscreens in paddlefish
  - c) Performed statewide Paddlefish angler survey... fishery still growing
- 5) Future Research 2019 and beyond
  - a) Investigations into recruitment, immigration, and harvest at Webber’s Falls Reservoir and Fort Gibson dam will continue
  - b) Funded project with SIU to examine dentary microchemistry and compare reproductive contrib. of 2 headwater rivers
  - c) Funded project with OK State Univ. to investigate factors influencing restoration success in 2 of 4 OK Reservoirs



### Shovelnose Sturgeon

Funding has been approved for additional low-water dams on the Arkansas River; however the USACE has yet to issue the 404 permits (despite having issued 401 permits). Discussions are ongoing and ODWC has maintained opposition to the structures on behalf of Shovelnose, Paddlefish, American Eel, and other migratory fishes.



**Oklahoma Department  
of Wildlife Conservation**

**Skylar Styves**  
Customer ID: 5578280



DOB: [REDACTED]      Order Date: 01/08/2019  
 Gender: M              Hunter Safety: Apprentice  
 Address: [REDACTED]

**CURRENT LICENSES**

License	Valid From	Valid To
Paddlefish	1/8/2019	12/31/2019

All applicable hunting licenses required in addition to this Hunter Safety Certification.

## SOUTH DAKOTA

MICRA Paddlefish/Sturgeon Committee Meeting  
South Dakota State Report – January 15-16, 2019  
Jason Sorensen, SDGFP

### **Paddlefish Tagging/Stocking**

South Dakota Game, Fish and Parks personnel conducted paddlefish tagging operations on the Missouri River below Gavins Point Dam. A total of 234 adult paddlefish were tagged with monel jaw tags in June, 2018. Tagged fish had an average length and weight of 873 mm and 8.5 kg respectively. Average relative weight was 70, similar to the previous 5 years. Relative weight of larger fish (900 mm to 1200 mm) were similar to the five-year averages for each 100 mm length group in that range.

During May, 2018 broodstock paddlefish were collected from Lake Francis Case, a mainstem Missouri River reservoir. Fish were collected near the White River confluence and transported to American Creek Fisheries Station in Chamberlain, SD. At the conclusion of fish collection, the fish were transported to Gavins Point National Fish Hatchery for artificial propagation and rearing. Adult fish used for propagation were returned to Lake Francis Case. This joint effort between South Dakota Game Fish & Parks and the United States Fish & Wildlife Service resulted in 17,166 (2,727 pounds) large fingerling paddlefish stocked in Lake Sharpe and 27,883 (5,401 pounds) large fingerling paddlefish stocked in Lake Francis Case in late August/early September 2018. All fingerlings were tagged with 1.5 length decimal coded wire tags during August 2018 as per MICRA stocking/tagging protocols.

### **Paddlefish Sport Fisheries**

South Dakota currently has three sport fisheries for paddlefish. A spring snagging season occurs in May on Lake Francis Case, a mainstem Missouri River reservoir. Beginning in 2019, anglers will have the option of utilizing snagging or archery during the Lake Francis Case season. Additionally, a summer archery season (June) and a fall snag fishery (October) take place in the Missouri River below Gavins Point Dam. Both Gavins seasons are jointly managed with the Nebraska Game and Parks Commission.

**Lake Francis Case Paddlefish Snagging:** Snagging for paddlefish on Lake Francis Case resumed in 2012 after being closed for nearly 30 years. Annual large fingerling stocking initiated in the early 1990's resulted in a paddlefish population capable of supporting limited sport harvest. Three hundred fifty resident-only permits are issued by the State of South Dakota while the Lower Brule and Crow Creek Sioux Tribes each offer 25 permits for a total of 400 permits. South Dakota Game, Fish & Parks has received an average of 1,840 applicants for its 350 permits. The season runs from May 1-31 and is open reservoir-wide. During May 2018 anglers snagged an estimated 2,799 hours and experienced a catch rate of 0.354 paddlefish/hour. Snaggers harvested an estimated 184 paddlefish while releasing an estimated 807 paddlefish in 2018.

**Gavins Point Dam Archery and Snagging Paddlefish Seasons:** South Dakota Game, Fish and Parks and the Nebraska Game and Parks Commission jointly manage archery and snag fisheries for paddlefish in the Missouri River below Gavins Point Dam. The 30-day archery season runs June 1-30 while the snag fishery is open for the month of October. South Dakota issues 255 resident and 20 non-resident archery permits and 1,550 resident and 50 non-resident snagging permits. During 2018, paddlefish archers spent an estimated 1,633 hours pursuing paddlefish with each archer spending an average of 7.5 hours hunting paddlefish. These



estimates are the lowest in over 20 years probably due to elevated water releases through Gavins Point Dam. Estimated archery harvest for 2018 was 137 paddlefish, with 48 percent of those fish being between 35 and 45 inches in length (protected harvest slot for the paddlefish snagging season). Paddlefish anglers spent an estimated 14,788 hours snagging for paddlefish during October 2018. Anglers harvested an estimated 295 paddlefish with 79 percent of those being under the 35-45 inch eye-fork protected slot. Anglers released an estimated 3,203 paddlefish with 62 percent of those being in the protected slot and 34 percent under the slot. Paddlefish anglers in 2018 experienced an overall catch rate of 0.24 paddlefish/hour of snagging.

### **Lake Sturgeon**

South Dakota Game, Fish and Parks is helping fund a lake sturgeon reintroduction project in Big Stone Lake (SD/MN borderwater) and the Minnesota River. The project is a cooperative effort with the Minnesota Department of Natural Resources. The plan calls for 4,000 Lake Sturgeon to be stocked annually. Lake Sturgeon were stocked in 2014 (6,500 fish), 2015 (7,570 fish), 2016 (3,036 fish), 2017 (4,068 fish), and 2018 (4,705 fish). Sturgeon were produced at Genoa National Fish Hatchery, Wisconsin. Plans call to stock annually for up to 20 years. Anglers have been catching lake sturgeon incidental to other species. Lake sturgeon have been commonly observed during annual gill net surveys conducted by the Minnesota Department of Natural Resources. A commercial fisherman reported catching 30 lake sturgeon in a single seine haul. Below is the largest Lake Sturgeon sampled to date from the stockings.



## Shovelnose Sturgeon

### Population Dynamics and Movement of Shovelnose Sturgeon in a Missouri River Impoundment

Aside from the free-flowing stretch of the Missouri River below Gavins Point Dam, little is known about Shovelnose Sturgeon (*Scaphirhynchus platyrhynchus*) in South Dakota. Shovelnose Sturgeon are found throughout the impounded portions of the Missouri River at low abundances, however little information exists regarding the ecology or population dynamics of this species in South Dakota. We examined growth and movement patterns of Shovelnose Sturgeon in Lake Sharpe, a small Missouri River impoundment in Central South Dakota.

In spring of 2017 and 2018, we deployed trotlines baited with night crawlers on the riverine section from below Oahe Dam (upper barrier to Lake Sharpe), downstream approximately 30 km to target Shovelnose Sturgeon within Lake Sharpe. All Shovelnose Sturgeon captured were weighed (g), measured (mm, FL), and tagged with an individually numbered floy tag. A small (10-15 mm) section of pectoral fin ray was collected in 2018 for age and growth analysis. In addition, 56 fish (26 in 2017 and 30 in 2018) were implanted with Vemco V13 acoustic telemetry tags. A total of 912 (459 in 2017 and 453 in 2018) Sturgeon were captured and tagged. Recapture and tagging efforts will continue this spring.

Initial results estimate a population of 5,301 adult Shovelnose Sturgeon in Lake Sharpe. Growth of adult Shovelnose Sturgeon appears to be slow (0-10mm/yr), similar to other populations throughout its native range. Shovelnose Sturgeon in Lake Sharpe can move as much as 16 river km per day, using deeper pools (4.48 m, 0.13 m SE) with little bottom current (1.44 m/s average, 0.52 m/s SE). In contrast, Shovelnose Sturgeon exhibit high site fidelity during winter months. Additional sampling and tracking will continue through the spring of 2020. We anticipate this study will answer questions regarding basic Shovelnose Sturgeon population demographics in Lake Sharpe, as this information has never been documented in the impounded sections of the Missouri River. Additionally, this spring a pilot project will begin on the lower Missouri River, including Lewis and Clark Reservoir. The eventual goal is to extend this research to the remaining Missouri River impoundments to better understand the status of Shovelnose Sturgeon in South Dakota.

TENNESSEE

# TENNESSEE'S MICRA REPORT



Prepared by:

**Eric Ganus**

**Commercial Fish and Mussel Coordinator**



Tennessee Wildlife Resources Agency  
Fisheries Management Division  
P.O. Box 40747  
Nashville, Tennessee 37204

## December 2018

### Roe

The majority of paddlefish harvested (90.3%) came from the Mississippi River, Kentucky and Chickamauga reservoirs (Table 1). Annual statewide harvest of flesh from paddlefish was 49,927 lb with 53.0% (26,479 lbs) harvested from Kentucky Reservoir. The total number of paddlefish harvested statewide was 2,324 with 51.4% (1,195) harvested from Mississippi River. Reported annual statewide harvest of paddlefish roe was 6,409 lbs with 54.1% (3,471 lbs) of the total from Mississippi River. Roe harvest for Kentucky reservoir remains well below the high in 2006 of 20,036 lbs.

Table 1. Annual statewide commercial paddlefish harvest in FY 2018 based on Daily Commercial Roe Fish Harvest Reports (WR-0896).

<u>Waterbody</u>	<u>Paddlefish</u>				<u>Total Number of Fish</u>
	<u>Flesh (lbs)</u>	<u>Egg Weight (lbs)</u>	<u>No. of Females</u>	<u>No. of Males</u>	
Kentucky Reservoir	26,479	1,668	377	201	578
Mississippi River	11,658	3,471	1,024	171	1,195
Chickamauga Reservoir	8,073	668	120	207	327
Barkley Reservoir	2,899	439	109	55	164
Old Hickory Reservoir	482	27	6	18	24
Cheatham Reservoir	188	20	5	9	14
Nickajack Reservoir	66	23	4		4
Guntersville Reservoir	30	57	7		7
Ft. Loudoun Reservoir		23	5	1	6
Not Provided	52	13	5		5
Total	49,927	6,409	1,285	461	2,324