MISSISSIPPI INTERSTATE COOPERATIVE RESOURCE ASSOCIATION

PADDLEFISH & STURGEON COMMITTEE

MEETING MINUTES & STATE REPORTS

04 March 2021

Virtual Meeting

COMMITTEE MEETING MINUTES

04 MARCH 2021

WELCOME/INTRODUCTIONS/OPENING REMARKS

The meeting was called to order at 9:00 am by Joe McMullen who introduced himself and welcomed all states to the meeting. A roll call of state representatives was conducted; it was determined that a quorum was met. The agenda was distributed and finalized, and the meeting was called to order.

PARTICIPATION

Chair and Delegate from Missouri: Joe McMullen

Assistant Chair and Delegate from Iowa: Ryan Hupfeld

Committee Delegates: Dave Glover (IL), Dennis Riecke (MS), Katie Zipfel (WV), Kirk Steffensen (NE), Craig Jansen (IN), Robby Maxwell (LA), Gary Smith (PA), Aaron Delonay (USGS), Jason Sorensen (SD), Jessica Morris (KY), Steve Rider (AL), Nick Kramer (KS), Tim Bister (TX), Eric Ganus (TN)

MICRA Coordinator: Greg Conover (USFWS)

Guests: Angie Rodgers (USFWS/LMRCC), Trish Yasger (MDC), George Scholten (IA DNR), Mike Montagne (USFWS), Sara Tripp (MDC), Dennis Scarnecchia (University of Idaho)

OLD BUSINESS

2019 and 2020 Meeting Minutes

Approved by a vote of silence. None opposed

***Joe McMullen will send Greg Conover approved meeting minutes to be uploaded to the Committee website.**

Assistant Chair: Ryan Hupfeld

Approved by a vote of silence. None opposed

Paddlefish Tagging Database

Ryan Hupfeld updated the group on the Paddlefish Tag Database. Nothing new to report. Last year Jason Schooley sent out a preformatted Excel spreadsheet to simplify the process of data entry, but little use or updating of the database has occurred since the last meeting. Several Delegates indicated that there is still a backlog of data. Ryan states that given the current use of the database is minimal, an overhaul of the database is not justified. The database just needs to be updated with all current data using the Excel spreadsheet Jason Schooley created. Joe indicated that there is a need to identify a new Sub-basin Coordinator for the Missouri River Basin. Jason Sorensen volunteered to fill that position.

***Ryan Hupfeld will send out the Excel spreadsheet to Committee Representatives again.**

***Greg Conover will send out the Committee Directory to be reviewed/updated as needed.**

A summer meeting (in person or virtual) was discussed. May be able to coordinate and have meeting in conjunction with LMRCC in July.

NEW BUSINESS

State Updates

Dave Glover (IL) updated the group on the status of IL's commercial fishing biologist vacancy. An offer will be made very soon.

Joe McMullen (MO) provided an update on MO's package of recreational and commercial fishing regulations for Paddlefish which may be implemented next year and include increased minimum length limits, a commercial fishing season, and rules to discourage party fishing. No Lake Sturgeon fry were stocked due to COVID-19.

Joe McMullen provided an update from Jessica Hogrefe (USFWS) on the Endangered Species Act listing for Lake Sturgeon.

- The 12-month finding for lake sturgeon is due in 2024, based on the FWS listing plan.
- However, last year a suit was filed to get an earlier due date/timeline for the finding. And that case is awaiting a judge's decision.

- FWS is planning to begin work in late Fall 2021/early 2022 and anticipating an extensive status assessment in a large geographic area. The process would likely begin with a fresh data request from and update to state partners. These timelines may shift and FWS will work with partners to manage requests, so they don't become too onerous.

See attached at end of meeting minutes for state reports from IA, IN, KS, KY, MO, ND OK, PA, WV.

Commercial Fishing Workgroup

Eric Ganus provided an update on the status and progress made by the group and what the group would cover for the afternoon session. See Commercial Fishing Workgroup discussion below for details.

***Joe McMullen will send the Wilberg Paddlefish Report to Greg Conover to be put on the Committee website.**

Assistant Chair Nominations

Joe asked for a nomination for Assistant Chair (2022-2023) from the Ohio River Basin. None were received.

***Joe McMullen will send out a request for nominations.**

NOAA Saltonstall-Kennedy Grant Proposal

Greg Conover provided an update and history of the NOAA Saltonstall-Kennedy Grant proposal and asked for input on what the broader needs are for the committee.

Dave Glover (IL) wanted the group to consider including information on the heterogeneity (population dynamics) of Paddlefish across its distribution and try to capture that in the future. The current proposal doesn't capture that.

Joe McMullen (MO) stated that there could be sub-basin management plans underneath the overall proposal in order to capture that.

Dennis Scarnecchia (Univ. of Idaho)- Agrees with Dave Glover's assessment of the current proposal objectives. The current proposal was not set up to capture that heterogeneity. It was more focused on coordinating with states to develop an overarching framework on how the basin manages Paddlefish. The AFWA proposal is a potential to fund a new project but would likely have to include 25 states.

Greg Conover- SK proposal geared towards the needs of the commercial fishing states in order to fit the funding source. A new project, and funding source, may provide an opportunity to look at basin wide management.

Sara Tripp (MO)- Is this an opportunity to get states on the same page with collecting the same data?

Ryan Hupfeld (IA)- Agrees with Sara. May be a good time to develop a management plan for Paddlefish as we don't currently have one. Would be good to document the current needs range wide of Paddlefish and give states documentation and leverage to collect more data in the future.

***Dennis Scarnecchia (Univ. of Idaho)- Has developed management plans and sampling protocols with multiple states and will send out to group.**

Multiple states said it is hard for them to justify sampling for Paddlefish. A basin wide approach and plan with data needs would be very helpful.

Tim Bister (TX)- Limited numbers of Paddlefish in the state, what would expectations be if project is developed?

Dennis Riecke (MS)- Doesn't think this would be intended to put pressure on states but to rather let them contribute when and where they can (e.g., some states may be restoring populations). States don't necessarily have to be contributing resources to a specific project. Developing a basin wide plan would contribute positively to Paddlefish populations and would be enough justification to support.

Greg Conover- Sounds like broad interest in at least objectives 1-3 from SK proposal.

Multiple states were interested in moving forward with a new proposal.

***Joe McMullen, Ryan Hupfeld, and Greg Conover will work together to:** 1.) poll states to see if they are supportive of pursuing funding opportunities, 2) develop an overview of what a project might look like, 3) include representation from each sub-basin at a minimum in project/development, 4) consider formation of a new ad-hoc committee to address broader basin wide assessment needs.

ADJOURN

Joe McMullen adjourned the meeting at 11:30 am.

COMMERCIAL FISHING WORKGROUP MEETING MINUTES

04 MARCH 2021

WELCOME/INTRODUCTIONS/OPENING REMARKS

The meeting was called to order at 12:30 pm by Joe McMullen who introduced himself and welcomed everyone to the meeting. A roll call of Committee Delegates was conducted. The agenda was distributed and finalized, and the meeting was called to order.

PARTICIPATION

Chair of the Commercial Paddlefish Workgroup and Delegate from Tennessee: Eric Ganus

Participants: Jessica Morris (KY), Dave Glover (IL), Craig Jansen (IN), Steve Rider (AL), Dennis Riecke (MS), Joe McMullen (MO), Ryan Hupfeld (IA), Angie Rodgers (USFWS/LMRCC), Sara Tripp (MDC)*,* Greg Conover (USFWS/MICRA Coordinator), Dennis Scarnecchia (University of Idaho)

DISCUSSION

Eric Ganus and Greg Conover provided an update and recap/history of the Commercial Fishing Workgroup.

Eric Ganus reviewed Dr. Wilberg's answers to Dave Glover's questions from last year's meeting.

- Question 1: *Refit the von Bertalanffy growth function using Linf as a constant and solving for k and t0. These are highly correlated parameters and changes to Linf by using an average length of fish age-15+ should result in changes to K and t0 that were determined by Sharov et al. (2014).*
  - Wilberg Answer 1: There is not a single growth curve in the Sharov et al. report. Rather, it includes a broad review and analysis of growth of paddlefish throughout its range. I have some concerns about some of the data we analyzed in that report as well as some of the published studies as the aging did not appear to be very accurate in several places. For our more recent report, we had updated data from the commercial sampling in each of the states and wanted to incorporate that into the analyses. The growth parameters are not estimable from the catch monitoring data alone, but these data do provide some information about growth. I thought updating the Sharov et al. values with the new data was a better approach than just using the values from that report.

- Dave Glover (IL) suggested not holding up the current effort. He believes we can move forward with what we have but want to continue to strive to get better information and understand all the uncertainties with age and growth, maturity, etc.

- Question 2: *Incorporate all existing data to estimate length at maturity to ensure estimate is more reflective of total range (MO, IN, etc.). Was all existing data used from MO and IN from 2014 through 2017?*
    - Wilberg Answer 2: If I'm understanding this question, the answer is no- the maturity from the commercial catch sampling from MO and IN were not used to estimate maturation curves. The main issue with any estimation of maturation curves for paddlefish is that immature fish generally seem to be underrepresented in the sampling. I was concerned that immature fish were underrepresented in the data that were provided by the states, which would bias the maturity curve toward younger, smaller fish. Based on conversations with Jeff Quinn, I thought the Arkansas data avoided those problems. That's why we used those.

    - Sara Tripp (MDC) had a question about if smaller fish were underrepresented in the sampling why that would bias maturity towards smaller fish. Eric Ganus (TN) explained the limitations of sampling and that they followed Dr. Wilberg's recommendations. There was discussion about what data was actually included and why only AR data was chosen to be used in the model. Craig Jansen (IN) has maturity data past 2017 that weren't included in the dataset.
    - Dennis Reicke (MS)- I don't want to complicate things but I believe that Missouri has a length limit that is lower than many states so using their commercial data should include smaller fish and perhaps more immature fish. It would be helpful if Wilberg could tell us what data sets he used.

- Question 3: *Conduct sensitivity analyses using a range of length at maturity (size at which 50% are mature) to determine how recommended minimum length limits change across this range. The range should be reflective of our confidence in length at maturity based on re-analysis using all existing data.*
    - Wilberg Answer 3: This sensitivity analysis could be done; however, the main challenge will be to develop the maturity curves to include more of the available data. If the immature fish are underrepresented in the sampling, this will cause a bias in the maturation curve, which we want to avoid. Therefore, it's possible some of the data may not be useful for estimating maturation.
    - Dave Glover (IL)- We don't need to collect data to conduct sensitivity analysis and could be done easily. This is something we haven't done yet.
    - Eric Ganus (TN)- This is the methodology that was already agreed upon from the beginning. Dr. Wilberg was answering our specific questions.

- ***Sara Tripp (MO), Craig Jansen (IN), and Dave Glover (IL) will frame any additional questions and forward them to Joe McMullen, Ryan Hupfeld, Eric Ganus, and Greg Conover. Eric will forward those questions to Dr. Wilberg for clarification.**
- Greg Conover- Summary: We want to understand how the data were used, what are some potential improvements, and we need to document and consider these potential improvements as we move forward. We can move forward with what we have now, but can still investigate improvements as we see necessary.
- Dave Glover (IL)- Suggests closing chapter on this modeling right now, but it is worth exploring additional models and data collection in the future and take an adaptive management approach.

Greg Conover provided an overview of where the committee was at on the regulations and restrictions considered up to this point. Powerpoint slides were reviewed and each section was reviewed to gain consensus. The workgroup's goal is to identify minimum regulatory standards and recommendations for commercial paddlefish fisheries on the lower Mississippi and Ohio rivers to achieve a management objective of F30. Once the workgroup makes a recommendation, the Committee would have the opportunity to accept and forward them on to sub-basin's (LMRCC, UMRCC, etc.) for consideration. The group discussed establishing standards for minimum length limits, season length/dates, permit quotas, gear restrictions (e.g., gill net minimum mesh size, number of nets allowed), and reporting requirements. Wilberg 2019 recommended a 36" minimum length limit for commercial paddlefish fisheries. The workgroup discussed a suite of regulations that could be implemented that would reduce harvest commensurate with a lower minimum length limit (below).

- Season Dates- Group agreed the 58 F threshold made sense and based on data.
    - ***Request from states to compile water temperature data including gage and years used. Update season dates table based on 58 F.**
    - ***Craig Jansen (IN) will provide Excel spreadsheet for entering water temperature information into.**
- Season Length- Group thought it was worthy of consideration, but more data is needed before a recommendation from the group can be made.
    - Craig Jansen (IN)- 20% decrease in harvest if 2 weeks of the season were cut off each end of the season dates.
    - ***Request from states to provide the percentage of harvest that would be reduced by shortening the season by two weeks on each end. Also, what percentage of harvest would be reduced or increased by using their corresponding season date changes based on the 58 degree criteria? For example, Illinois opener would change from 1 Oct. to 1 Nov. on the MSR and TN would be opening two weeks earlier.**
- Gear Restrictions- Group thought it may be worthy of consideration, but more data is needed before a recommendation from the group can be made.
    - Gear Tags- No need for standard recommendation.
    - ***Request from states to review and update regulations table to ensure everything is current.**
- Reporting Requirements- Consistent reporting back to MICRA would be helpful. More discussion is needed to determine what standards the group wants to be included before a recommendation from the group can be made.

    - ***Request from states to review and update reporting requirements table to ensure everything is current. Also, please provide commercial harvest report form(s).**
- ***A deadline of March 21, 2021 was set to gather information above.**
- ***A follow-up call will be scheduled once the requested data has been collected, compiled, and shared with the commercial harvest state representatives.**

STATE REPORTS

IOWA

Iowa MICRA Paddlefish and Sturgeon Committee Meeting Update

Iowa Regulation Change for Shovelnose Sturgeon on Upper Mississippi River:

In 2007, a 27" commercial fishing minimum length limit was implemented. Additionally, in 2009 a rule was passed that made it illegal to possess any Shovelnose Sturgeon less than 27" in Iowa waters to help prevent commercial fishers from just using an Illinois license.

Since the regulation change, the population appears to be responding well. Annual standardized trawling catch rates of Shovelnose Sturgeon have increased substantially since 2011 (i.e., twenty-eight-year median- 2.79 fish/haul, median for years 1993-2009- 2.08 fish/haul, median for years 2010-2020- 7.10 fish/haul; Figure 2). Commercial overharvest of mature females appears to be the primary factor that was affecting the reduced natural recruitment.

Continue to work with interconnected state agencies (e.g., Illinois) to continue to develop consistent regulations and management strategies.

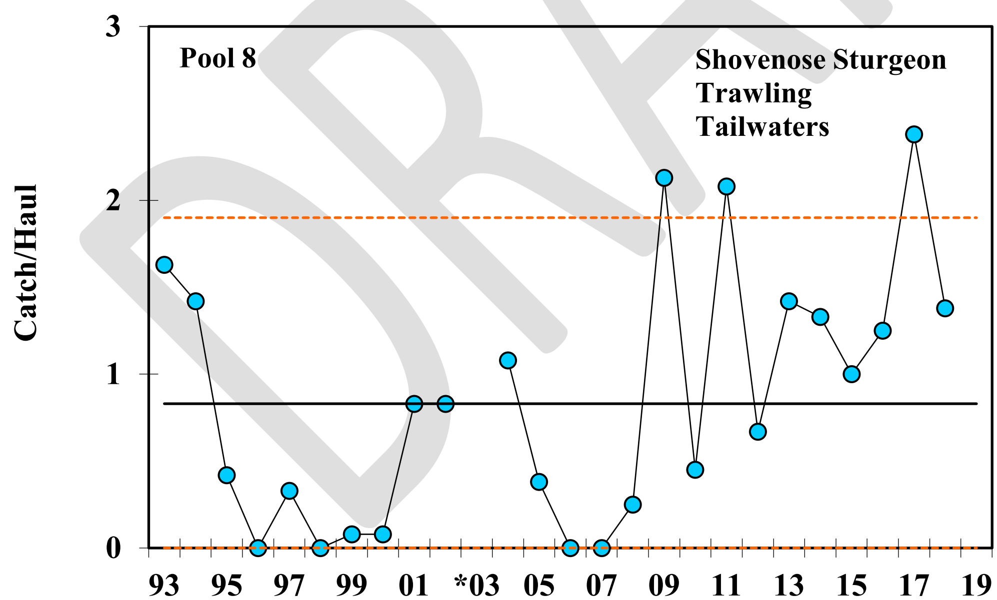


Figure 1. Trends in mean catch per unit effort (CPUE; circles), with 27-year medians (solid line) and 10% and 90% percentiles (dashed lines) of Shovelnose Sturgeon in Pool 8 tailwater trawling used in LTRM sampling, 1993-2019 with 27" minimum length limit in place.

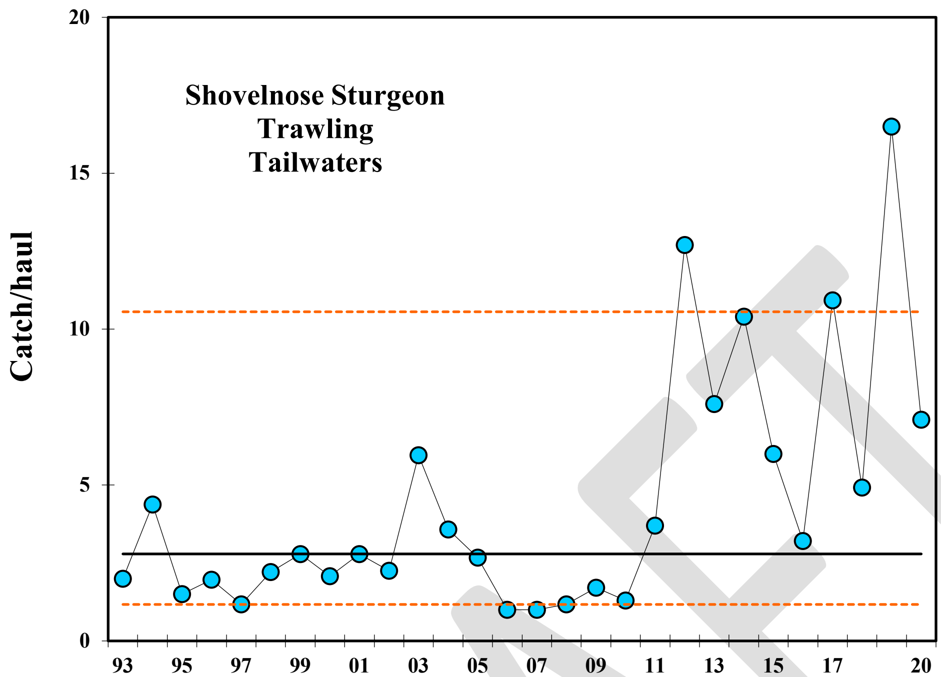


Figure 2. Trends in mean catch per unit effort (CPUE; circles), with 28-year medians (solid line) and 10% and 90% percentiles (dashed lines) of Shovelnose Sturgeon in Pool 13 tailwater trawling used in LTRM sampling, 1993-2020 with 27" minimum length limit in place.

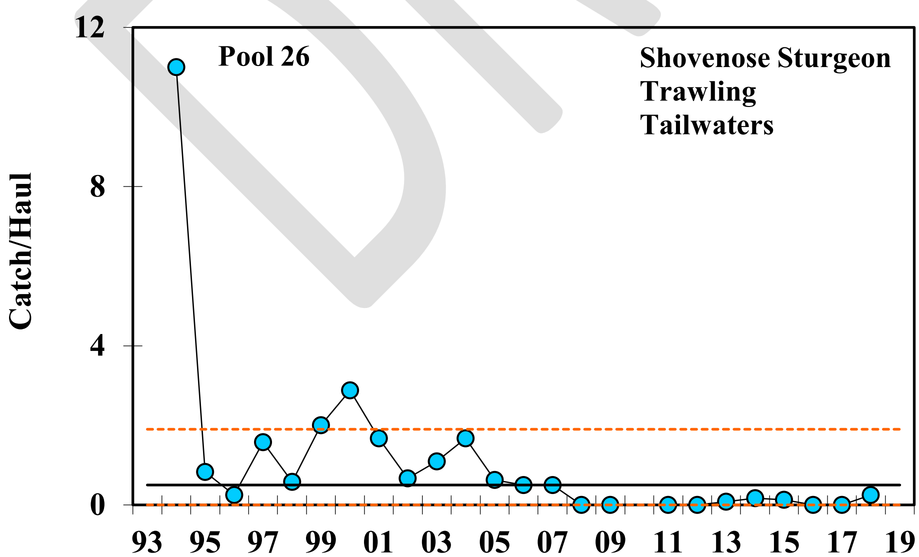
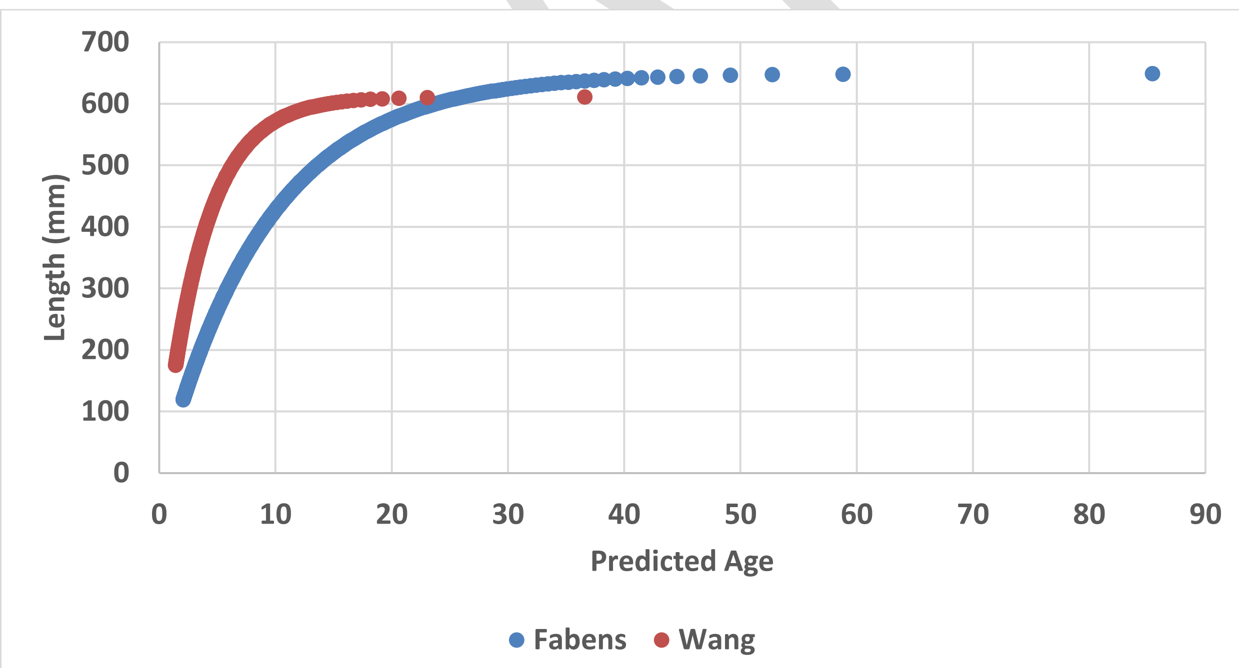


Figure 3. Trends in mean catch per unit effort (CPUE; circles), with 27-year medians (solid line) and 10% and 90% percentiles (dashed lines) of Shovelnose Sturgeon in Pool 26 tailwater trawling used in LTRM sampling, 1993-2019 with no minimum length limit in place.

Shovelnose Sturgeon Cedar River:

<u>Population Demographics</u>:

- Have been sampling and tagging Shovelnose Sturgeon in the Cedar River since 2006 so we have a fairly substantial mark-recapture database
- Using this we are investigating:
    - Growth via mark-recapture similar to Hamel et al. (2014 and 2015).
        - Growth is SLOW!
        - Once individuals reach 550mm growth slows to ~3 mm/year
        - Likely reach ages much older than previously thought



        - Still working through model to predict estimated max age but it currently does not predict growth of smaller individuals very well
            - Still trying to diagnose why this is happening and how we may be able to make adjustments to make it fit better

- Will likely be conducting bomb radiocarbon analysis summer 2021 to get a better idea of actual longevity and growth of the species and population
    - Otoliths are very small (0.00012- 0.00327g) and fragile, which makes processing very challenging
    - Were able to get "readable" sections with annuli

Larval Drift of *Scaphyrincus* spp. in the Des Moines, Iowa, and Cedar rivers

This will be starting a project investigating larval reproduction of *Scaphyrincus* spp. and Paddlefish spring/summer 2021 in the Des Moines River with hopes of expanding to the Iowa and Cedar rivers. The plan is to continue this for 5 years with the hopes of multiple flow pulses from Red Rock Dam through the Sustainable Rivers Program. The primary objectives of this project are to: 1) Document *Scaphirhynchus* spp. and Paddlefish reproduction in the Des Moines River, 2) Evaluate inter-annual variation in relative abundance and larvae drift patterns (e.g., portion of water column, segment of river), and 3) Evaluate what environmental variables (e.g., flow pulses/discharge and temperature) most likely contributed to successful natural reproduction to guide efforts to increase *Scaphirhynchus* spp. and Paddlefish natural reproduction via targeted flow releases

Telemetry Array Development in the Cedar, Iowa, and Des Moines rivers

Working with Iowa State University and United States Fish and Wildlife Service to develop an acoustic telemetry array in the Des Moines (N=15) and Cedar and Iowa (N=10) rivers this year. Acoustic receivers will be mounted on various bridge piers in strategic locations. Once telemetry receiver array is in place, we will begin implanting acoustic transmitters into Shovelnose Sturgeon to evaluate movement patterns and residency.

INDIANA

2021 MICRA Paddlefish/Sturgeon Committee
Virtual Meeting – March 4, 2021
Indiana State Update – Craig Jansen

- 2020 Paddlefish Sampling:
  - Only one sampling trip was completed at Hovey Lake. 10 paddlefish were captured, 4 were female, none were gravid. Mean length was 810 mm (31.9 in).

- 2020 Shovelnose Sturgeon Sampling:
  - Annual spring sampling during spawning run did not happen. Conducted one day of sampling downstream in May. Collected 160 shovelnose sturgeon in 2 drift nets. Mean length was 609 mm (24.0 in). No gravid females were collected. 11 fish were recaptures, 5 of which were at-large for over 8 years – most fish showed little to know growth. One fish was at-large for 10.6 years and grew -6 mm during that time.

- 2020 Lake Sturgeon Sampling:
  - Annual monitoring of the small East Fork White River population as usual.

- 2020 Commercial Fishing:
  - Three Ohio River roe harvester license holders
    - Collectively reported 807 Paddlefish and 1178.68 pounds of eggs
    - Collectively reported 4 shovelnose sturgeon and 2.18 pounds of eggs
  - No inland roe harvester licenses were sold.

KANSAS

MICRA Paddlefish and Sturgeon Committee - Kansas State Report

Submitted by Nick Kramer, Kansas Department of Wildlife, Parks, and Tourism

Management:

We are currently drafting a state alternative fisheries management plan that includes Paddlefish and sturgeon. The goal is to get it out to our state committee to review in late April.

Stockings:

In 2019 we began reintroduction efforts in the Kansas River and Marias des Cygnes River by stocking 5,000 6-8" Paddlefish into three reservoirs (Tuttle Creek and Perry Reservoir in the Kansas River basin and Pomona Reservoir in the MDC basin). These fish were surplus fish from Gavins Point NFH and Missouri's Blind Pony Hatchery. John Redmond, in the Neosho basin, was also stocked with 5,000 fish from Tishomingo NFH, as it has in the past.

In 2020 we received ~50,000 eyed fry from Gavins Point NFH to raise in ponds back in Kansas but heavy predation (or some other mortality) resulted in much lower harvest than expected and only 25 fish were stocked in Tuttle Creek. No fish were supplied from Tishomingo in 2020 either.

In 2021, our state hatcheries are again going to try to acquire some smaller sized fish or fry (likely from Gavin's Point) and raise them to the size we are wanting.

In 2022, there are plans add Elk City Reservoir into the Paddlefish group, stocking 5,000 6-8" fish supplied from Tishomingo NFH to support the Verdigris River population. Elk City may receive surplus fish in 2021, if any.

Anglers have been seeing Paddlefish in these systems that have only received a few stockings. Numerous reports have come in of anglers accidentally snagging them or seeing them near the surface beneath Tuttle Creek and a couple of reports have come in of anglers accidentally snagging a couple roughly 30 miles upstream of Perry Reservoir proper.

There is growing optimism of the potential success of these reintroductions but a lot hinges on our hatcheries ability to raise Paddlefish or acquire them through trades.

Regulation:

In 2020 anglers were given the option to electronically tag their harvested Paddlefish using KDWPT's HuntFishKS app. Anglers are able to record the county, date, time of harvest, and enter a photograph of the entire fish. No reports of the number of anglers who opted for this method or any issues with it.

KENTUCKY

MICRA Paddlefish and Sturgeon Committee 2020 Report from

Kentucky Department of Fish and Wildlife Resources

Lake Sturgeon

Culture— In 2020, no lake sturgeon cultures were conducted due to COVID – 19 complications.

Management—Lake sturgeon sampling is conducted annually using trotlines (250.0 ft long with 50 hooks baited with nightcrawlers). Prior to 2017 the Cumberland River and Big South Fork were sampled in alternating years. Sampling was increased in 2017 and new sampling sites were added to collect additional data and attempt to decrease variability in catch rates. During December 2019 and January 2020 a total of 35 trotlines, 12 in the Cumberland River and 23 in Big South Fork, were successfully set and retrieved. A total of 71 lake sturgeon were collected with a CPUE of 2.0 fish/line. Thirty-one lake sturgeon were collected from the Cumberland River (CPUE=2.6 fish/line), and 40 fish were collected from the Big South Fork (CPUE=1.7 fish/line). Both were record highs. Mean fork-length at age of capture indicates that growth of stocked lake sturgeon appears to be good. On average, fish exceeded 20.0 in by age-3, and were near 40 in by age-10. Mean fork-length at age of capture was consistently higher in Big South Fork as was relative weight. No sampling was conducted in late 2020 due to COVID-19 concerns and issues associated with obtaining sampling permits.

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Shovelnose Sturgeon

Commercial harvest—Currently, commercial harvest of shovelnose sturgeon in Kentucky is permitted in the Ohio River basin. The season runs from October 15 – May 15 and fish must be 24.0 – 32.0 in fork length to be harvested. Licensed commercial fishermen must report harvest monthly via a mail-in harvest log system. Hoop nets are the primary gear used to capture shovelnose sturgeon, with a minimal amount of harvest occurring using gill nets and trotlines. During the 2019 – 2020 season a total of 754 shovelnose sturgeon were harvested from Kentucky waters accounting for 1,906 lbs of flesh and 356 lbs of roe. The 2020 - 2021 season has not concluded but at this point a total of 2,237 shovelnose sturgeon have been harvested accounting for 6,431 lbs of flesh and 1,034 lbs of roe.

Paddlefish

Commercial harvest—The statewide paddlefish gillnet season extends from November 1 through April 30 while the shovelnose sturgeon season extends from October 15 through May 15. The gill net season on Kentucky and Barkley Lakes extends from November 1 through only March 31. In addition, paddlefish can be harvested with trotlines through May 31 from all waters open to commercial fishing, except the Ohio and Mississippi rivers. The statewide minimum length limit on paddlefish was set at 32.0 in eye-fork length, except for Kentucky and Barkley Lakes where the minimum eye-fork length is 38.0 in. During the 2019 – 2020 season 4,930 paddlefish were harvested accounting for 84,631 lbs of flesh and 9,227 lbs of roe. The 2020 - 2021 season has not concluded but at this point a total of 3,209 paddlefish have been harvested accounting for 59,599 lbs of flesh and 7,262 lbs of roe.

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MISSOURI

Report to the MICRA Paddlefish and Sturgeon Committee

Missouri

<u>Lake Sturgeon (LKSG)</u>

Management

Lake sturgeon were captured by anglers in the Salt River below the Mark Twain Lake Reregulation Dam for the second straight year in 2019. And a transmittered lake sturgeon from the Missouri River tributaries project was detected in the area as well. This prompted MDC Lake Sturgeon Recovery Team Leader to offer a presentation to US Army Corps of Engineers staff on the recent detections, and to ask for permission to place informational banners at the site to educate anglers, place telemetry remote receivers in the area, conduct adult lake sturgeon electrofishing sampling, place egg collector mats in the area, and conduct larval drift net sampling during spring 2021. Informational banners and telemetry remote receivers will be installed in March, 2021. If water and power generation conditions allow, sampling efforts will be allowed as well. If spawning is confirmed at this site, it will be the second confirmed spawning site in the state.

Due to Covid physical-distancing protocols, Wisconsin DNR staff were unable to collect lake sturgeon eggs or milt for propagation purposes. Consequently, neither MDC nor USFWS hatchery facilities reared or stocked lake sturgeon fingerlings in Missouri waters during 2020. Stockings are expected to resume in 2021.

Contact Information:

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- Phone: 573-248-2530 x6385

Culture & Stocking

Lost Valley Fish Hatchery held no potential LKSG fry or fingerlings during the 2020 production year. Due to the concerns of Corona Virus, the Wild Rose Hatchery in Wisconsin did not collect broodstock or spawn LKSG in 2020, therefore MDC did not receive any eggs or fry, and no LKSG were stocked from Lost Valley in 2020.

Literature Available: 2019 Lake Sturgeon Production and Stocking Report

Contact Information:

- Name: Drew Burdick

- Email: drew.burdick@mdc.mo.gov
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Research

Missouri River Tributary Lake Sturgeon Project: The objectives of the project are to determine habitat selection, distribution, movement, and site fidelity of stocked age-0, subadult, and adult LKSG in the Osage and Gasconade rivers. Sixty-six adult/subadult LKSG were tagged with Vemco V16 transmitters in the Osage River and 34 in the Gasconade River. We concluded manual tracking in June 2020. We will continue monitoring movement of tagged LKSG using a network of 17 Vemco stationary receivers through May 2021 with a project Final Report to be submitted to MDC by June 30th, 2021.

Missouri River tributaries appear to be important habitats, with LKSG spending >70% of their time there. Tributary use is highest in the spring spawning season when many LKSG make upstream migrations. Upstream migrations appear to be related to elevated flows at temperatures from 12-20°C and thermal and hydrologic differences may cause migratory differences observed in both rivers. Tributary residency remains high throughout the summer in the Osage River but declines during the summer in the warmer, smaller Gasconade River. While we have not observed evidence of reproduction, we have documented aggregations of LKSG near large shoals in the Osage River that may provide suitable spawning habitat. Habitat selection models suggest that during summer, fall, and winter LKSG select the deep (>7 m) habitats with low current velocities and fine substrates. There were three major areas with these habitats used by Lake Sturgeon: near the mouths of the Osage and Gasconade rivers and in a gravel dredging pool in the Osage River. Deepwater foraging and resting refugia may be a limiting habitat resource during the summer and winter in these rivers. We are currently analyzing habitat mapping data from side-scan sonar to develop seasonal habitat suitability models.

The Osage and Gasconade rivers are the most frequently used tributaries by LKSG we have tagged. LKSG have been detected in the Moreau, Lamine, Grand, and Salt (Mississippi R.) rivers. An adult male LKSG was detected by a receiver at Rathbun Dam, 142 miles up the Chariton River and another near Gavin's Point Dam in Yankton, SD. Fish mix in both tributaries suggesting that they may not be distinct management units. 66% of Gasconade tagged fish having spent time in the Osage and 38% of Osage tagged fish having spent time in the Gasconade. Up to 9 individuals made upstream migrations in both tributaries in the same spring season.

We conducted a telemetry study to assess interannual variability in movements and survival of stocked age-0 Lake Sturgeon. From October 2018 to February 2019, we tracked 91 telemetry tagged age-0 Lake Sturgeon and from October 2019 to March 2020 we tracked an additional 96. Age-0 individuals were divided into four batches and released at two sites on the Osage River (river miles 10 and 50) and two sites on the Gasconade River (river miles 9 and 50) to test the effect of stocking location. Our results suggested that tributary retention of stocked juveniles throughout the study period was high between 82 to 96%. Survival estimates were higher when incorporating manual detections and averaged 53% over the study period with no clear influence of stocking site. Dispersal was greatest at warmer water temperatures and highest for upstream stocking sites particularly in the Gasconade River. By the end of the study period many individuals from upstream and downstream stocking sites mixed in the lower 25 miles of the tributaries. Habitat selection models suggest that age-0 Lake Sturgeon select shallower habitats than adults (2-7 m deep) at slow-moderate current velocities. Age-0 LKSG are frequently relocated downstream of inside river bends in habitats in current seams where transitions from finer to coarser sediments occurred. Mini-Missouri Benthic trawls were validated as an effective sampling method to recapture stocked age-0 and age-1 Lake sturgeon occupying these habitats.

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<u>Pallid Sturgeon (PDSG)</u>

Culture & Stocking

Blind Pony Fish Hatchery transported and held no potential PDSG broodstock during the 2020 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 2020.

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Research

Pallid Sturgeon Monitoring-Missouri River: The 2020 sampling year in Missouri was impacted by high Missouri River levels early in the season, but still resulted in 51 pallid sturgeon capture events (40 hatchery and 11 wild). Seventeen pallid sturgeon were captured above the confluence with the Kansas River in Segment 9 and 34 captured below the Kansas River in Segment 10. Hatchery fish were comprised of 13 year classes. Several hatchery year classes were only represented by a few individuals. The 2002-year class has historically been one of the most frequently sampled year-classes, averaging 31% of the total hatchery-origin catch from 2005- 2017 but only averaged 5% of the total hatchery fish catch for the last three years. 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 continued to display a positive trajectory in subsequent years and are now similar to those seen in 2008 - 2013.

Intensive sampling for young-of-year sturgeon resulted in capturing 2244 individuals. Genetic samples were taken on each and results are still pending. The number of age-0 sturgeon collected per day in otter trawls peaked from 18 June to 25 June in Segment 9 and 11 June to 25 June in Segment 10 with numbers significantly dropping after the first week in July for both segments. This could be indicative of low survival with few cohorts as multiple bends with high catch rates in June were revisited in July to find lower catch rates. Bends only sampled in July contributed some of the lowest catch rates. Alternatively, since a variety of habitats were sampled in July, the reduction in catch rates could indicate low retention in areas able to be sampled by otter trawl. Overall, there is still insufficient documented recruitment of naturally reproducing pallid sturgeon.

Active telemetry tracking of adult sized pallid sturgeon was implemented in 2020. With the assistance of the USGS, 14 pallids (>1000g) were implanted with Vemco acoustic tags. Fifty pallid sturgeon detections were recorded through tracking sweeps from May through September across both segments. During May, one reproductively ready female pallid sturgeon was located at RM 447.6 and tracked starting May 6 to record any potential spawning behavior. Starting May 15, it exhibited signs of spawning at RM 472.4 over 11 days. It was then recaptured on May 29th and physically examined. Consensus from an ultrasound and egg sample is that this fish spawned.

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Habitat Assessment and Monitoring Program – Interception and Rearing Complexes Evaluation: Primary objectives for 2020 fieldwork involved identifying areas of age-0 sturgeon interception along the lower Missouri River. Fieldwork focused on locating and identifying "hotspots"- discrete patches with consistently high catch per unit area (CPUA) of age-0 sturgeon, defined as greater than 10 age-0 sturgeon (<110 mm FL) per 100 m2. Saline City Bend (RM 212.5-216.1) and Salt Creek Bend (RM 210.0 – 212.6) were selected based on high catch rates in previous years. Saline City bend sampling started in May but was abandoned due to low catch rates in early June. Sampling shifted to Salt Creek Bend in June with sampling resulting in high catches of Age-0 sturgeon at several discreate locations within the dike field. Catch per unit area at this site ranged from 0.00-20.6 fish/100m2 and resulted in 696 age-0 sturgeon. All age-0 sturgeon had genetic samples taken and are awaiting results. Mean depth did not differ significantly between hotspot locations, however, highest catch rates were at mean trawl depths between 2-3 m on inside bend dikes and 3.5-5.5 m on outside bend dikes. Additional monitoring at Salt Creek Bend during August and September 2020 yielded low catches of age-0 sturgeon within areas functioning as hotspots during June sampling. Catch per unit area declined with time at the Salt Creek Bend hotspot during August and September sampling. Shifting drift dynamics at varying discharges may be responsible for lower catch rates during August and September. Alternatively, high mortality or downstream drift of age-0 sturgeon could explain the paucity of fish later in the sampling season.

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Pallid Sturgeon Monitoring-Mississippi River: The Missouri Department of Conservation's Big Rivers Science Unit was contracted to complete Pallid Sturgeon Population Assessment Program age-0 sturgeon monitoring in 8 bends of the Middle Mississippi River. All bends were sampled during the months of May and July. Ninety percent of all age-0 sturgeon captures occurred in water temperatures between 22°C and 27°C. Hotspots were characterized by areas of shallow depths and low velocities generally found within the inside bend of the river below river training structures or natural breaks in the water current caused by land masses. Sampling resulted in the capture of 2418 age-0 sturgeon. Genetic samples were taken, and results are pending.

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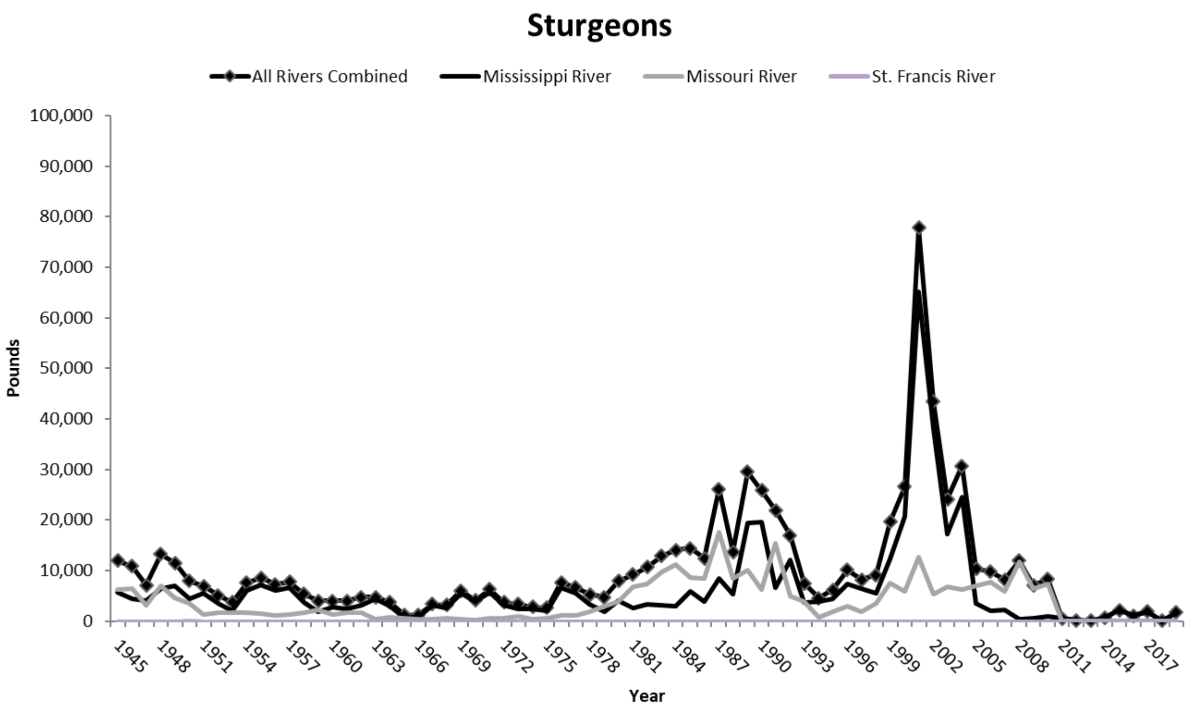
<u>**Shovelnose Sturgeon (SNSG)**</u>

Commercial Fishing Program

Upper Mississippi River shovelnose sturgeon harvest increased from 48 lbs. in 2018 (the second lowest harvest ever recorded) to 1,671 lbs. in 2019 (411 fish (average weight 4 lbs./fish); 241 lbs. of roe). Most of the harvest was taken from Pool 24.



Pounds of sturgeons commercially harvested, by river and from all rivers combined: 1945-2019. Currently only shovelnose sturgeon are available for commercial harvest, however historical data includes the harvest of all sturgeon species combined.

Literature Available: Missouri Commercial Fish Harvest Report 2019

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<u>**Paddlefish (PDFH)**</u>

Management

Reservoir Snag Fisheries: The 2020 snagging season was good. Rains and high-water levels maintained good flows for most of the snagging season. As a result, snaggers harvested a lot of fish. Snaggers had good luck on the three reservoirs (Lake of the Ozarks, Harry S. Truman Lake and Table Rock Lake), Truman was a little more of a challenge at times due to flooding on the upper lake and in the Marias des Cygnes River. We did see fish run up the Marias des Cygnes River into Kansas. We're continuing to see good snagging on the Lamine and Osage rivers. At times high flows kept snaggers off the Mississippi and Missouri rivers and some of their tributaries. The 2021 snagging season should be good. The extremely large 2008-year class of fish is now 13 years old and will continue to provide large fish for snaggers to harvest. Snaggers should see a lot of sublegal fish, especially 30-32-inches from the really large 2016 stocking. We continuing to see an increase in complaints from “traditional” snaggers about those using dipsy divers – complaints include operating boats too fast around traditional snaggers, damage to sublegal sized fish and releasing legal sized fish (which is not legal).

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Culture & Stocking

Broodstock: Blind Pony Fish Hatchery staff continued PAH broodstock collection much earlier than the traditional timeline. Staff collected Osage River broodstock on February 18th, and the Truman Reservoir broodstock on February 19th. It continues to be seen that early collection offers several benefits including; an increased timeline to collect needed broodstock, increased docility of PAH due to the cooler water temperatures, a decrease in pre-spawn mortality (0 in 2018-2020), and an overall reduction of stress on staff. Staff continues to use ultra-sound to identify reproductive broodstock. Using this device, staff can immediately identify the sex and maturity of male and female PAH after they are removed from gill nets. Potential broodstock are kept, while all other fish are immediate returned to the water.

In 2020, a total of 49 broodstock paddlefish (PAH) were collected for spawning at Blind Pony Hatchery. These fish were collected from Harry S. Truman Reservoir (20) near the Fox Run boat ramp, and the Osage River (29) directly below the Bagnell Dam. Emphasis was placed on the Osage River collection due to the lower likelihood of collecting hatchery reared fish as broodstock in this location.

2020 Paddlefish Broodstock Numbers/Origins

- 4 females collected from Truman
- 16 males collected from Truman
- 18 females collected from Osage River
- 11 males collected from Osage River

Spawning: Twenty-One Females were given a dose of 0.1 mg/kg of LHRH-a through two intraperitoneal injections. 0.1 of total dose was given 32 hours before expected ovulation. The remaining .9 dose was injected 20 hours prior to expected ovulation. All males received .1 mg dose 32 hours prior to spawning which has long been proven to be sufficient for adequate sperm production.

Fifteen 1:1 PAH male x female crosses were achieved. Decisions on specific male x female crosses were made at random during the spawning process. In total, 1,846,638 eggs were produced from 15 females and 15 males. A 96% hatch rate was achieved for a total of 1,764,381 fry. Six females did not give any eggs.

- 1,849,638 eggs were collected
- 1,764,381 hatched
- 96% Hatch
- 1,638,148 fry stocked

Osage River (open-river) broodstock contributed to 88% of all fry produced. Some of these were crossed with Truman Lake males/females. Only 14% of fry produced were a pure Osage x Osage cross.

Male x Female	**Truman x Truman**	**Truman x Osage**	**Osage x Osage**	**Osage x Truman**
Fry	191,742	148,798	226,534	1,071,074
% of all Fry	12%	9%	14%	65%

Production: Eight 1.5-acre earthen ponds were used for advanced production of PAH. Ponds were filter-filled and fertilized two weeks prior to fry stocking. Fry were stocked on two occasions, April 16th and April 22rd. This was due to the spawning taking place over two separate weeks and a subsequent gap between family groups hatching.

Distribution of family groups to ponds were determined by the size of each family group and the total number of fry needed. Each pond was represented with a nearly equal percentage of fry from every family group. Assuming equal survival among family groups post fry stocking, progeny from all contributing broodstock were equally available in every pond at time of harvest.

The previous year fry were stocked at a rate of 33,333 fry/acre and 50,000 per/acre to see if fry survival was dependent on stocking densities. Harvest data showed no apparent relation of fry survival rates as compared to fry stocking densities in ponds. Fry were stocked at a rate of 50,000 per acre. In total, 612,361 fry were stocked into Blind Pony Hatchery production ponds. 1,638,148 PAH fry were realized due to the exceptional hatch percentage (96%). 1,025,787 Surplus fry were stocked into Lake of the Ozarks.

- 612,361 fry stocked to Blind Pony production ponds.
- 1,025,787 fry stocked to Lake of the Ozarks

PAH were fed a Skretting trout diet ranging from #1 starter to 4.5 mm.

Harvest: A Phase 1 or early harvest was done on June 1st to get a solid inventory and to redistribute fish with a known set number. Historically the only known inventories would be at the time of fry stocking and the harvest for lake stockings in late September to Mid-October. The Phase 1 harvest resulted in 70,360 5.1-inch average fish being inventoried. 53,221 were redistributed to hatchery ponds to be held for later stockings. A surplus of 17,141 were realized and stocked into Truman Reservoir (8,710) and Lake of the Ozarks (8,431). Fish stopped being visible in Pond 29 during Phase 1 production and it was completely absent of fish when harvested. This pond experienced high levels of planktonic algae with secchi readings consistently around 1-4”. It is speculated that this may have been the cause of mortality. Pond 36 also experienced dense algae blooms and produced only 450 fish. Neither of these ponds were treated differently than the other ponds.

Phase 1 Harvest:

- 70,362 fish harvested
- 53,221 set in hatchery ponds (May/June)
- 8,710 Harry S. Truman Reservoir (June)
- 8,431 Lake of the Ozarks (June)

				Where Stocked									Pond Information			
Pond #	Harvest Date	fpp	Length (in)	Pond 6	Pond 8	Pond 16	Pond 17	Pond 24	Pond 25	Truman	LOZ	Inside	Pond Total	Starting Head #	Date Fry Stocked	% Return
29*	28-May	-	-										0	76,421	4/16-23/20	0.00%
30	1-Jun	63.3	5.4							2,595	8,431		11,026	76,368	4/16-23/20	14.44%
31	1-Jun	63.7	5.1					2,484		6,115			8,599	76,141	4/16-23/20	11.29%
32	1-Jun	69.7	5.3					4,056	6,008				10,064	76,491	4/16-23/20	13.16%
33	29-May	77	4.9			2,602	5,528						8,130	76,428	4/16-23/20	10.64%
34	29-May	74	4.9	15,379		3,433							18,812	76,689	4/16-23/20	24.53%
35	28-May	77.3	4.8		13,279								13,279	76,933	4/16-23/20	17.26%
36	28-May	61.83	5		377							73	450	76,890	4/16-23/20	0.59%
				15,379	**13,656**	**6,035**	**5,528**	**6,540**	**6,008**	**8,710**	**8,431**	**73**				
													Ponds Total	**Starting Head #**		**% Return**
													70,360	**612,361**		**11.49%**

Paddlefish were harvested and stocked again in Mid-June. Traditionally, PAH have been harvested and stocked in late September to Mid-October. Often, major fish loss is observed over the summer months. To avoid this summer loss, approval was received to stock some paddlefish before summer set in. On June 10th 12,548 were harvested and stocked in Truman Reservoir. On June 11th 11,585 were harvested and stocked in Lake of the Ozarks. These fish averaged 7.4 inches at the time of stocking.

29,035 paddlefish were held onsite for fall stocking. Staff saw noticeable decline of these fish numbers in the ponds starting in July and continuing till late August. Paddlefish were rarely seen in late August until harvest in October. On October 13th 147 fish were harvested from pond 6 and 1,494 fish were harvested from pond 8. All these fish were taken to Table Rock Lake. The majority of these fish looked healthy, however, a few sickly fish from this harvest were sent off for pathogen testing. One of the fish tested positive for Ranavirus. A stringent testing regime is being developed to monitor for future outbreaks.

Phase 2 Harvest:

- 25,774 fish harvested

- 11,585 Lake of the Ozarks (June)
- 12,548 Harry S. Truman Reservoir (June)
- 1,641 Table Rock Lake (October)

				15,000	15,000	7,500	500
Pond #	**Harvest Date**	**fpp**	**Length (in)**	**Lake Ozark**	**Truman**	**Table Rock**	**Black River**
6	13-Oct	4.72	14.42			147	
8	13-Oct	5	14.98			1,494	
16	11-Jun	30.6	7.4	6,057			
17	11-Jun	32.6	7.5	5,528			
24	10-Jun	25.3	7.1		6,540		
25	10-Jun	27.3	7.4		6,008		
Total Shipped				**11,585**	**12,548**	**1,641**	**0**
Phase 1 Stocking				**8,431**	**8,710**	**0**	**0**
Total Stocked				**20,016**	**21,258**	**1,641**	**0**

Total Stocking:

- 20,016 Lake of the Ozarks
- 21,258 Harry S. Truman Reservoir
- 1,641 Table Rock Lake

A need was realized to determine if paddlefish stocked into a reservoir continue rapid growth rates observed in a hatchery setting (~1" of length every 5 days). An onsite study was performed to determine growth rates of fish stocked into a low-density environment with low food availability. A 1/10th acre pond was filled with lake water and received no fertilization to promote plankton. The only available food came from the water which was sourced from Blind Pony Lake. No supplemental food was supplied throughout the entire study period to this pond. Fish were stocked into the study pond at three intervals (fry, 5.12", and 7.61"). Fish stocked in the larger size groups received fin clips and elastomer tags for later identification. The larger fish were fed in normal production ponds up until the time of stocking into the study pond to imitate harvest and stocking into a reservoir.

The length data below shows that paddlefish of all sizes continued rapid growth despite being taken off feed (Group B, C) or never being fed (Group A Fry). Implications are that fish stocked into a reservoir during May/June will continue growing at a rapid pace and may quickly outgrow predators. This work will be repeated in 2021.

Average Total Lengths (In.)								
Date:	17-Apr	28-May	9-Jun	16-Jun	24-Jun	1-Jul	4-Aug	13-Oct
Group A	Fry	4.8	7.68	8.93	10.56	11.57	14.00	20.05
Group B	Newly Stocked----->	5.12	7.69	8.99	10.42	11.63	14.14	17.93
Group C (Both)	Newly Stocked----->		7.61	8.52	10.33	11.41	14.03	18.66

Paddlefish Spawning Data:

Eggs collected

Female	Jaw T	Source	Sacrificed?	Died in Ponc	Male	Male sourc	Date Injec	Date Spav	Aquariu	Time Release	Egg/r	# of Egg	Date	Egg/r	# of Egg	Start Hat	Finish Hat	Projected Fry	Actual F	Projected % Hat	% hatch 2nd cou
Green C		Osage	No	No	Blue K	Truman	3/30/2020	3/31/2020	1	7:30 AM	50.5	98,571	4/6/20	31	86,529	4/7/2020	4/12/2020	68,271		69	78.9
Green A		Osage	No	No	Blue D	Truman	3/30/2020	3/31/2020	2	7:30 AM	48.6	250,080	4/6/20	37.2	246,427	4/7/2020	4/12/2020	244,209		98	99.1
Green E		Osage	No	No	Blue A	Truman	3/30/2020	3/31/2020	3	7:30 AM	41.5	92,046	4/6/20	37	76,593	4/7/2020	4/12/2020	75,290		82	98.3
Green H		Osage	No	No	Clear C	Osage	3/31/2020	4/1/2020	4	7:00 AM	49.6	112,727	4/6/20	46.7	99,442	4/8/2020	4/13/2020	94,469		84	95.0
Green F		Osage	No	No	Blue H	Truman	3/31/2020	4/1/2020	5	7:00 AM	59	167,500	4/6/20	41.2	202,263	4/8/2020	4/13/2020	194,981		116	96.4
Yellow B		Truman	No	No	Blue I	Truman	3/31/2020	4/1/2020	6	8:30 AM	49.6	220,024	4/6/20	40	217,662	4/8/2020	4/13/2020	208,520		95	95.8
Green J		Osage	No	No	Blue B	Truman	3/31/2020	4/1/2020	7	8:30 AM	52.3	98,982	4/6/20	48.8	109,682	4/8/2020	4/13/2020	101,785		103	92.8
Yellow C		Truman	No	No	Clear A	Osage	4/1/2020	4/2/2020	16	7:00 AM	48	156,148	4/7/20	41	164,904	4/9/2020	4/14/2020	160,781		103	97.5
Green K		Osage	No	No	Blue E	Truman	4/1/2020	4/2/2020	15	7:50 AM	56.5	162,075	4/7/20	46.5	180,146	4/9/2020	4/14/2020	170,958		105	94.9
Green L		Osage	No	No	Blue P	Truman	4/6/2020	4/7/2020	14	7:15 AM	57.1	89,498	4/13/20	39.3	76,704			75,707		85	98.7
Green N		Osage	No	No	Blue J	Truman	4/6/2020	4/7/2020	13	7:00 AM	59.5	102,054	4/13/20	36.3	85,882			84,250		83	98.1
Green M		Osage	No	No	Blue O	Truman	4/6/2020	4/7/2020	12	7:15 AM	61	126,276	4/13/20	41.3	131,908			131,908		104	100.0
Green R		Osage	No	No	Clear H	Osage	4/7/2020	4/8/2020	11	7:15 AM	57.6	78,359	4/13/20	41.6	71,351			70,495		90	98.8
Green O		Osage	No	No	Clear G	Osage	4/7/2020	4/8/2020	10	7:15 AM	47.2	48,856	4/13/20	37.2	44,002			42,990		88	97.7
Green P		Osage	No	No	Clear I	Osage	4/7/2020	4/8/2020	9	10:30 AM	56.5	43,442	4/13/20	44.6	41,993			39,767		92	94.7
							Day 1 Total					440,697			409,549			387,770	0	88	95
							Day 2 Total					599,233			629,049			599,755	0	100	95
							Day 3 Total					318,223			345,050			331,739	0	104	96
							Day 4 Total					317,828			294,494			291,865	0	93	99
							Day 5 Total					170,657			157,346			153,252	0		
							GRAND TOTAL					**1,846,638**	-	-	**1,835,488**		**Total**	**1,764,381**	**0**	**96**	**96**

Females no eggs

Female	Jaw Tag	Source	Sacrificed?	Died in Pond?	Male	Male source	Date Inject	Date Spawn
Yellow A		Truman	No	No	-	-	3/30/2020	3/31/2020
Green D		Osage	No	Yes	-	-	3/30/2020	3/31/2020
Green B		Osage	No	No	-	-	3/30/2020	3/31/2020
Green I		Osage	No	No	-	-	3/31/2020	4/1/2020
Green G		Osage	No	No	-	-	3/31/2020	4/1/2020
Yellow D		Truman	No	No	-	-	4/6/2020	4/7/2020

Fry Stocking

Pond				29	30	31	32	33	34	35	36	Total	Pond	Lake Ozarl
Female	F x M Cross	Date	Aquarium	fry	fry	fry	fry	fry	fry	fry	fry	fry	**Female**	
Green C	Osage x Truman	4/16/2020	1	5050	5058	5072	5164	5065	5043	5039	5178	40,669	Green C	24,841
Green A	Osage x Truman	4/16/2020	2	5001	5018	5070	5046	5165	5105	5172	4994	40,571	Green A	183,274
Green E	Osage x Truman	4/16/2020	3	5111	5140	5063	5068	5111	5055	5058	5150	40,756	Green E	31,080
Green H	Osage x Osage	4/16/2020	8	5062	5000	4971	5104	5054	5100	5129	5208	40,628	Green H	48,456
Green F	Osage x Truman	4/16/2020	5	5024	5124	5018	5038	4997	5014	5038	5206	40,459	Green F	139,069
Yellow B	Truman x Truman	4/16/2020	7	5032	4992	5020	5016	5008	5182	5451	5044	40,745	Yellow B	150,997
Green J	Osage x Truman	4/16/2020	4	5039	5003	5111	5087	5115	5059	5115	5139	40,668	Green J	55,005
Yellow C	Truman x Osage	4/16/2020	16	5169	5148	5212	5011	5043	5083	5237	5051	40,954	Yellow C	107,844
Green K	Osage x Truman	4/16/2020	15	5232	5061	5105	5095	5036	5403	5237	5183	41,352	Green K	116,646
Green L	Osage x Truman	4/22/2020	12	5829	5524	5594	5601	5661	5738	5765	5862	45,574	Green L	27,119
Green N	Osage x Truman	4/22/2020	14	5636	5538	5618	5658	5770	5513	5484	5621	44,838	Green N	35,470
Green M	Osage x Truman	4/22/2018	13	5546	5626	5695	5676	5603	5577	6355	9580	49,658	Green M	74,025
Green R	Osage x Osage	4/22/2020	11	5599	6059	5578	5788	5642	5692	5599	5603	45,560	Green R	22,441
Green O	Osage x Osage	4/22/2020	10	4050	4064	3995	4012	4120	4036	4064	4071	32,412	Green O	9,520
Green P	Osage x Osage	4/22/2020	9	4041	4013	4019	4127	4038	4089	3190	0	27,517	Green P	0
Total				**76421**	**76368**	**76141**	**76491**	**76428**	**76689**	**76933**	**76890**	**612,361**	**Total**	**1,025,787**

Phase 1 harvest

2020 Paddlefish Harvest - Blind Pony Hatchery

Pond #	Harvest Date	fpp	Length (in)	Pond 6	Pond 8	Pond 16	Pond 17	Pond 24	Pond 25	Truman	LOZ	Inside
29*	28-May	-	-									
30	1-Jun	63.3	5.4							2,595	8,431	
31	1-Jun	63.7	5.1					2,484		6,115		
32	1-Jun	69.7	5.3					4,056	6,008			
33	29-May	77	4.9			2,602	5,528					
34	29-May	74	4.9	15,379		3,433						
35	28-May	77.3	4.8		13,279							
36	28-May	61.83	5		377							73
				15,379	**13,656**	**6,035**	**5,528**	**6,540**	**6,008**	**8,710**	**8,431**	**73**

Pond #	Pond Information					
	Pond Total	Starting Head #	Date Fry Stocked	H2O Harvest Temp	Days in Pond	% Return
29	0	76,421	4/16-23/20			0.00%
30	11,026	76,368	4/16-23/20			14.44%
31	8,599	76,141	4/16-23/20			11.29%
32	10,064	76,491	4/16-23/20			13.16%
33	8,130	76,428	4/16-23/20			10.64%
34	18,812	76,689	4/16-23/20			24.53%
35	13,279	76,933	4/16-23/20			17.26%
36	450	76,890	4/16-23/20			0.59%

Ponds Total	Starting Head #		H2O Harvest Temp	Days in Ponds	% Return
70,360	**612,361**				**11.49%**

Phase 2 harvest

2020 Paddlefish Harvest - Blind Pony Hatchery

Pond #	Harvest Date	fpp	Length (in)	Lake Ozark	Truman	Table Rock	Black River	Other
				15,000	**15,000**	**7,500**	**500**	
6	13-Oct	4.72	14.42			147		
8	13-Oct	5	14.98			1,494		
16	11-Jun	30.6	7.4	6,057				
17	11-Jun	32.6	7.5	5,528				
24	10-Jun	25.3	7.1		6,540			
25	10-Jun	27.3	7.4		6,008			
Total Shipped				**11,585**	**12,548**	**1,641**	**0**	**0**
Phase 1 Stocking				**8,431**	**8,710**	**0**	**0**	**0**
Total Stocked				**20,016**	**21,258**	**1,641**	**0**	**0**

Pond #	Pond Information					
	Pond Total	Starting Head #	Date Stocked	H2O Harvest Temp	Days in Pond	% Return
29	147	15,379	4/16-23/20			0.96%
30	1,494	13,656	4/16-23/20			10.94%
31	6,057	6,057	4/16-23/20			100.00%
32	5,528	5,528	4/16-23/20			100.00%
33	6,540	6,540	6/1/2020			100.00%
34	6,008	6,008	6/1/2020			100.00%

Ponds Total	Starting Head #		H2O Harvest Temp	Days in Ponds	% Return
25,774	**53,168**				**48.48%**

Stocked Total	Hauling Mortality	Harvest Total	Remaining In Ponds
25,774	0	25,774	0

Growth Study: We initiated this experiment in order to study the growth rates of paddlefish fry/fingerlings stocked into a low-density environment. The goal was to simulate the growth rates of fish stocked at different sizes and to observe differences caused by handling stress or switching fish suddenly from a commercial diet to a natural food diet. To do this we utilized a 1/10th-acre pond and three groups of PAH (Groups A, B, & C). Group A was stocked as fry to serve as a constant throughout the experiment. These fish never received a commercial diet at any point of the study. Groups B & C were reared in production ponds to different average lengths where they received a commercial diet until they were stocked into the study pond. In this way we were able to observe and compare the post stocking growth rates of PAH stocked at an average total length of 5.12" (Group B) and 7.6" (Group C) with fish that were stocked as fry and never received a commercial diet.

Average Total Lengths (In.)								
Date:	**17-Apr**	**28-May**	**9-Jun**	**16-Jun**	**24-Jun**	**1-Jul**	**4-Aug**	**13-Oct**
Group A	Fry	4.8	7.68	8.93	10.56	11.57	14.00	20.05
Group B	**Newly Stocked----->**	5.12	7.69	8.99	10.42	11.63	14.14	17.93
Group C (Both)	**Newly Stocked----->**		7.61	8.52	10.33	11.41	14.03	18.66

Days per Inch of Growth	
Group A (6/9-6/24)	**4.86**
Group B (5/28-6/24)	**5.09**
Group C (5/29-6/24)	**4.79**

F.P.P								
Date:	**17-Apr**	**28-May**	**9-Jun**	**16-Jun**	**24-Jun**	**1-Jul**	**4-Aug**	**13-Oct**
Group A	Fry		18.67	16.00	7.33	6.55	4.74	1.51
Group B		61.83	18.00	13.60	7.74	6.54	4.54	1.94
Group C (Both)			19.51	16.00	9.41	6.90	4.54	1.68

Inventory								
Date:	**17-Apr**	**28-May**	**9-Jun**	**16-Jun**	**24-Jun**	**1-Jul**	**4-Aug**	**13-Oct**
Group A No Clip	500 Fry	Unknown	28	24	22	18	11	2
Group B Left Clip		51	18	17	15	14	13	3
Group C Elastomer			30	24	23	17	8	1
Group C No Elast.			30	28	27	25	15	4

Literature Available: Blind Pony State Fish Hatchery Report 2020

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Research

Statewide Paddlefish Reproduction and Exploitation in Missouri's Large Rivers and Reservoirs: A draft final report and potential regulation changes have been submitted from the 5-year exploitation study. In order to meet the objectives of the project, in the large rivers (Mississippi and Missouri rivers and their tributaries) 2,311 PDFH were tagged with jaw bands, 102 of those with transmitters, and on the Mississippi River 1,015 trawls were completed to document successful reproduction. Of the 2,224 PDFH tagged in the Mississippi River that were ≥ 24-inches, 139 tags were called in and 92 were harvested by commercial and recreational anglers over the 5-year study. The average annual exploitation rate was

2.5% (± 0.58; range 1.36 – 4.25) when factoring in a non-reporting rate of 12.75% if we consider all PDFH implanted with transmitters that were not detected by the stationary receiver array as not reported. During the five-year study high water levels limited the number of effective fishing days, exploitation rates may be higher in years with more effective fishing days.

In addition to the primary objectives of this project we have also summarized additional information to help inform potential regulation changes, including length at maturation for PDFH in the Mississippi River Basin. Length at first maturation for females (black eggs/ready to spawn that year) was 28-inches for a small portion of the fish collected and checked. None of the females at our current length limit of 24-inches were reproductive, our current length limit does not protect our spawning stock. Our spawning stock needs to be protected to support a self-sustaining PDFH population on our large rivers. At 32-inches, 41 percent of all females that were checked, were mature (had black eggs, or had spawned at least once and were developing eggs). PDFH are interjurisdictional, increasing Missouri's minimum length limit would protect the spawning stock and align our regulations more closely with other states within the Mississippi River Basin.

Potential River Recommendations:

- Establishing a paddlefish commercial fishing season of Nov. 1 to April 15
- Establishing a 32-inch minimum length limit statewide (recreational and commercial) while retaining special regulations on some reservoirs.

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

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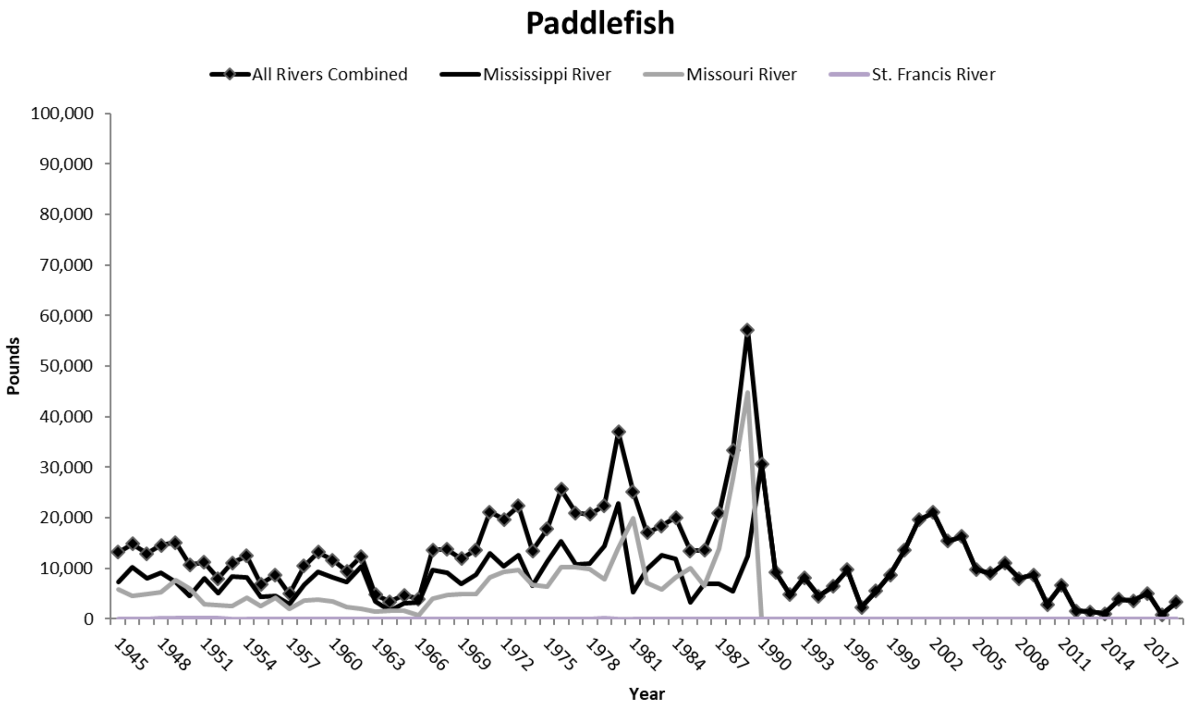
Commercial Fishing Program

Mississippi River paddlefish harvest increased from 872 lbs. in 2018 (the lowest harvest ever recorded) to 3,305 lbs. in 2019 (162 fish (average weight 20.4 lbs./fish); 295 lbs. of roe). Paddlefish harvest was highest on the lower Mississippi River (2,741 lbs.).



Pounds of paddlefish commercially harvested, by river and from all rivers combined: 1945-2019.

Literature Available: Missouri Commercial Fish Harvest Report 2019

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NORTH DAKOTA

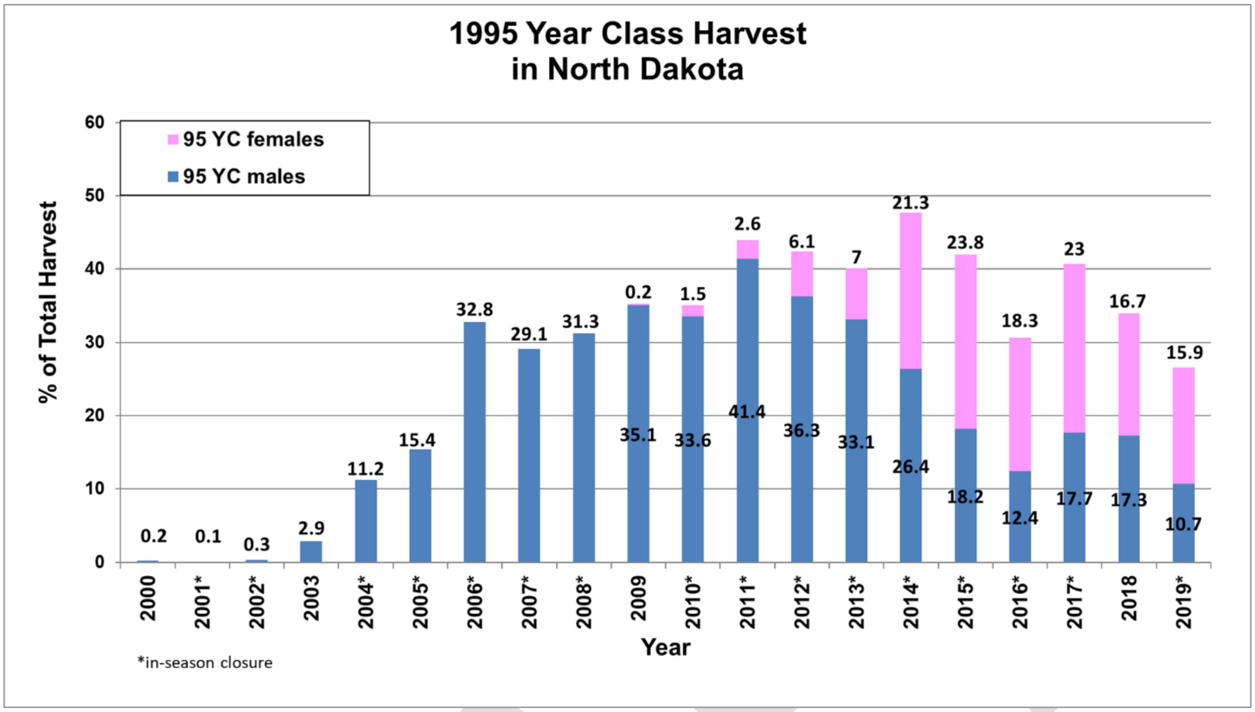
MICRA Report for North Dakota, 2020

Two distinct paddlefish populations exist in the Missouri River System in North Dakota: the Sakakawea population in northwest ND (which supports a recreational fishery jointly managed by the States of North Dakota and Montana) and the Oahe population in south central ND (does not support a recreational fishery).

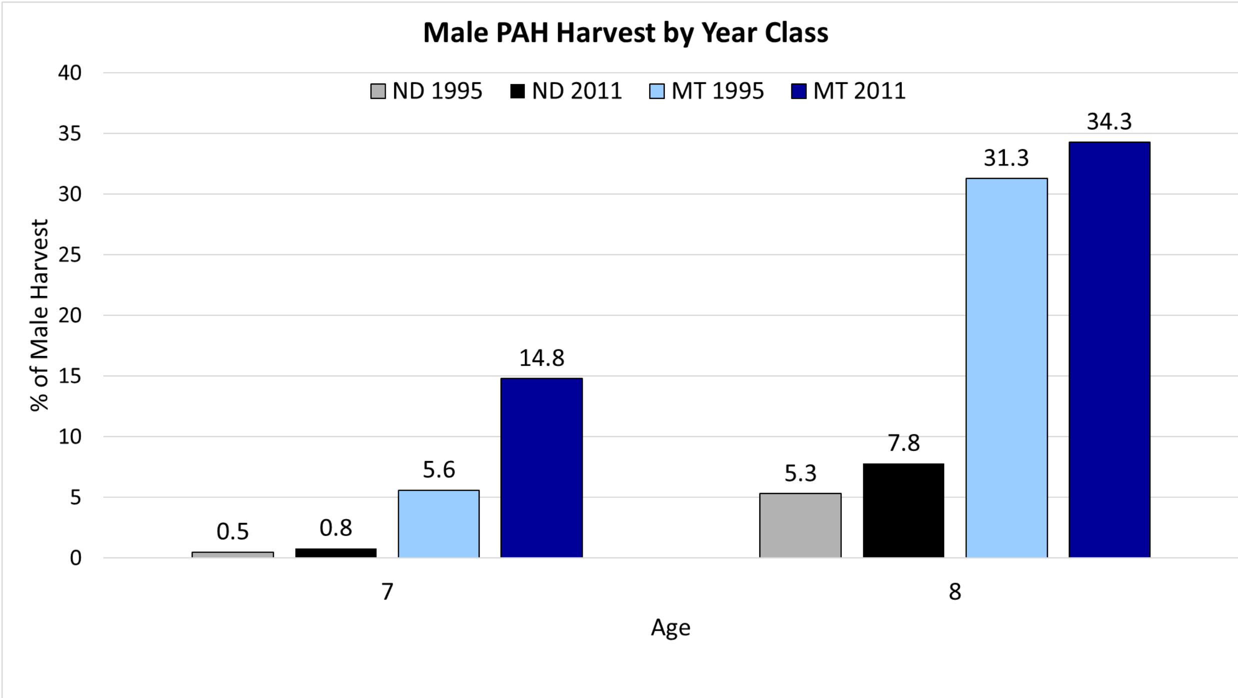
Sakakawea Population

Due to the worldwide COVID-19 pandemic, the North Game and Fish Department cancelled the Sakakawea population's annual paddlefish snagging harvest season in 2020. The paddlefish season is one of the largest social events in North Dakota's outdoors, but historically fewer snaggers participate on snag and release days than on snag and harvest days. In order to reduce the crowding that happens during a normal season, the department announced on May 4 that it would hold the one-week snag and release season from May 15 -21. A paddlefish tag was not required in 2020. Activity at some of the popular paddlefish snagging locations in 2020 was relatively light when compared to a normal year. The snag and release season in 2020 gave avid snaggers an opportunity to participate in the paddlefish season and helped reduce crowding that normally happens during a harvest season. The snaggers who participated in the 2020 season were quite successful, with many snagging and releasing several fish a day. With the snag and release only season in 2020, there was no data collected from the Yellowstone River-Lake Sakakawea stock of paddlefish in North Dakota.

For many years the 1995 year class has contributed to a large portion of the overall paddlefish harvest in North Dakota. The earlier maturing males were fully recruited to the snag fishery in 2006 at age-11, comprising 32.8% of the total harvest. Later maturing females were fully recruited to the fishery in 2014 at age-19, comprising 21.3% of the total harvest. The strong 1995 year class still accounted for 26.6% of the total paddlefish harvest in 2019.

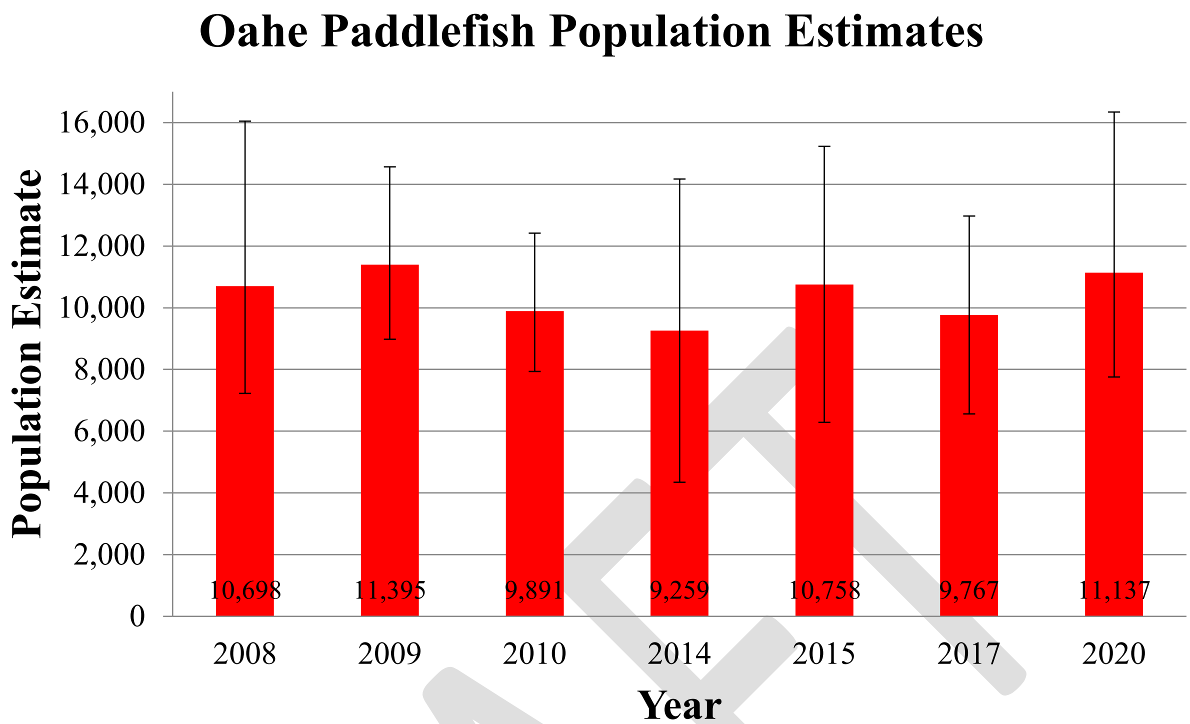


Early indications of another strong year class of Yellowstone-Sakakawea stock paddlefish from 2011 began to show up in the Montana harvest in 2018 at age-7. The young males tend to make their first spawning migration earlier in the year, they travel further upriver and are available to snaggers in Montana at a younger age before they become a component of the harvest in North Dakota. When comparing early maturing age-7 and age-8 males from their respective year of harvest in North Dakota and Montana, it appears the 2011 year class of fish maybe just as strong as the 1995 year class. Age-7 males comprised only 5.6% of the total male harvest from Montana in 2002, while age-7 males comprised 14.8% of the total male harvest in 2018. Age-8 males comprised 31.3% of the total male harvest from Montana in 2003, while age-8 males comprised 34.3% of the total male harvest in 2019. The age-7 males from both year classes made up a much smaller component of the total male harvest in North Dakota in 2002 and 2018 but started to show up more as age-8 in 2003 and 2019. The 2011 year class strength is more evident in the North Dakota harvest when looking at age-8 fish. Age-8 males comprised 5.3% of the total male harvest from North Dakota in 2003, while age-8 males comprised 7.8% of the total male harvest in 2019. If there is a paddlefish harvest season in North Dakota in 2021 we are anticipating a strong return of age-10 males from the 2011-year class of fish.

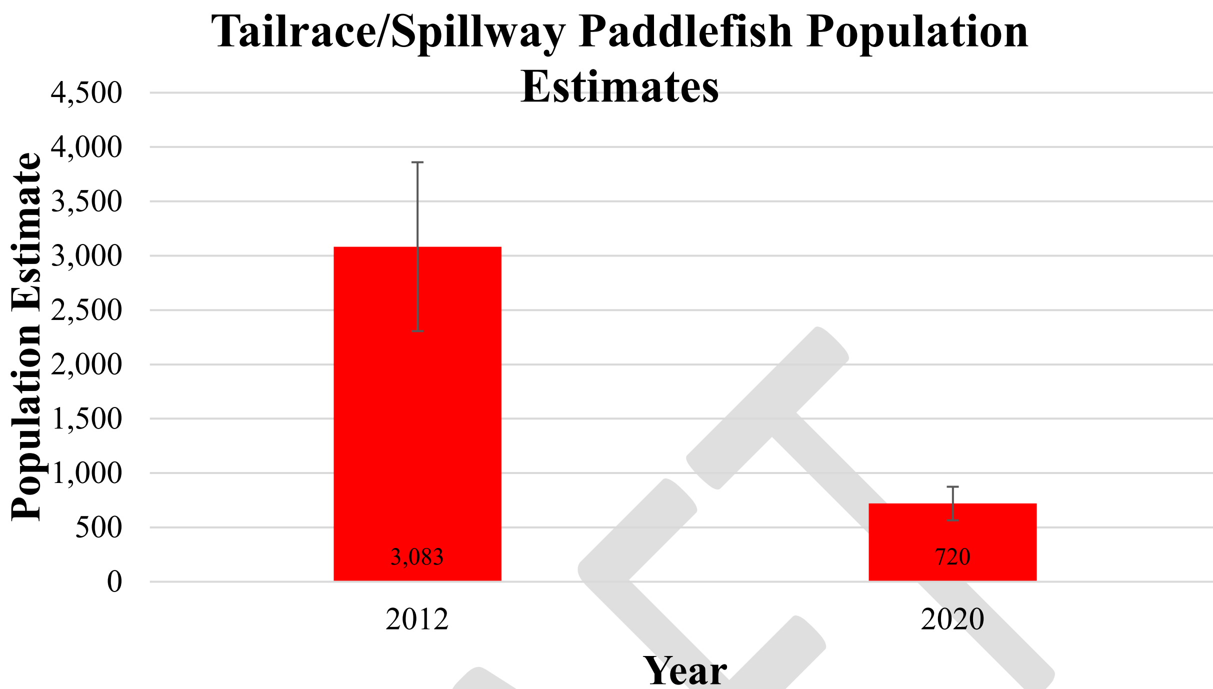


Oahe Population

The Oahe population is annually sampled with floating multi-filament gill nets in the Missouri River upstream of Lake Oahe and all fish are tagged with individually numbered monel jaw tags. Occasionally, sample sizes and weather conditions allow the estimation of population size (number of adult paddlefish in the Missouri River above Lake Oahe at the time of sampling) via multiple-pass mark-recapture population estimates. Population size was estimated at approximately 11,000 adult paddlefish in 2020. These estimates likely only represent approximately half of the adult paddlefish in the Oahe population as males typically enter the Missouri River above Lake Oahe every 1 or 2 years in an attempt to spawn and females every 2 or 3 years.



Additionally, a smaller number of paddlefish are present immediately below Garrison Dam. Most of these fish were entrained through Garrison Dam during the 2011 Missouri River Flood. Entrainment was also documented to a smaller degree during 2018 and 2019. The number of adult paddlefish present in this area has substantially declined from the 2012 to the 2020 population estimates. This is likely due to the poor conditions these paddlefish experience due to lack of zooplankton (mean relative weights of these fish typically range from 76-79).



Tailrace/Spillway Paddlefish Population Estimates
Population Estimate
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
3,083
720
2012
2020
Year

SOUTH DAKOTA

MICRA Paddlefish/Sturgeon Committee Meeting

South Dakota State Report – March 4, 2021

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 122 adult paddlefish were tagged with monel jaw tags in June, 2020. Tagged fish had an average length and weight of 856 mm and 7.9 kg respectively. Average relative weight was 71, 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, 2020 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 18,205 (1,582 pounds) large fingerling paddlefish stocked in Lake Sharpe and 35,116 (2,828 pounds) large fingerling paddlefish stocked in Lake Francis Case in early September 2020. All fingerlings were tagged with 1.5 length decimal coded wire tags during August 2020 as per MICRA stocking/tagging protocols.

Paddlefish Sport Fisheries

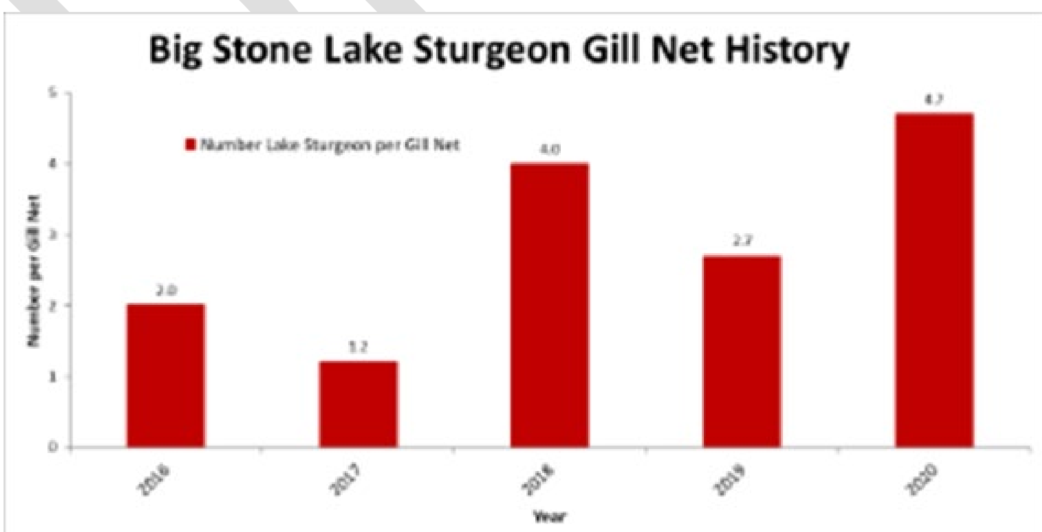
South Dakota currently has three sport fisheries for paddlefish. A spring snagging season occurs in May on Lake Francis Case, a mainstem Missouri River reservoir. Since 2019, anglers have had the option of utilizing snagging or archery during the Lake Francis Case season. Additionally, a summer archery 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 1,845 applicants for its 350 permits. The season runs from May 1-31 and is open reservoir-wide. During May 2020 anglers snagged an estimated 2,882 hours and experienced a catch rate of 0.262 paddlefish/hour. Snaggers harvested an estimated 251 paddlefish (highest since re-initiation of the season) while releasing an estimated 505 paddlefish in 2020.

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 2020, paddlefish archers spent an estimated 3,600 hours pursuing paddlefish with each archer spending an average of 13.1 hours hunting paddlefish. Estimated archery harvest for 2020 was 164 paddlefish, with 49 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 16,373 hours snagging for paddlefish during October 2020. Anglers harvested an estimated 386 paddlefish with 81 percent of those being under the 35-45 inch eye-fork protected slot. Anglers released an estimated 8,956 paddlefish with 68 percent of those being in the protected slot and 31 percent under the slot. Paddlefish anglers in 2020 experienced an overall catch rate of 0.57 paddlefish/hour of snagging.

<u>Lake Sturgeon</u>

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. Lake sturgeon were historically present in the lake but had disappeared by 1950 (likely due to winterkill, summerkill, and barriers to migration). The plan calls for 4,000 Lake Sturgeon to be stocked annually until a self-sustaining population exists. Lake Sturgeon stocking and has occurred annually since 2014 with the exception of 2020 due to Covid-19 . Sturgeon were produced at Genoa National Fish Hatchery, Wisconsin. The stockings have been successful. Lake sturgeon are frequently caught by anglers (incidental to other species) and in Minnesota DNR sampling. A commercial fisherman reported catching 30 lake sturgeon in a single seine haul. Below is the Lake Sturgeon CPUE for Minnesota DNR gill nets.



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 platorynchus*) 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.

The first four years of sampling for Shovelnose Sturgeon are complete. From March through May of 2017, 2018, & 2019 Shovelnose Sturgeon were captured using trot lines. Due to Covid-19 restrictions no additional sampling was conducted in 2020. Sampling locations were distributed from below Oahe Dam (upper barrier to Lake Sharpe), downstream approximately 30 km. Each trotline contains 20 individually baited hooks and 223 trotlines (4,460 baited hooks) were ran overnight during the 2017 sampling period, 269 (5,380 baited hooks) during the 2018 sampling period, and 172 (3,440 baited hooks) during the 2019 sampling period. Sampling crews have collected 1,251 Shovelnose Sturgeon during this three-year timeframe (2017 = 471, 2018 = 547, 2019 = 233). All fish were affixed with a FloyTag with a unique identifier and 113 recaptured individuals were caught during the three-year sampling timeframe (2017 = 5, 2018 = 68, 2019 = 40). All fish collected were weighed (g) and measured (mm), and the first pectoral fin ray removed and retained for later age and growth classification.

As of spring 2018, 55 adult (> 500mm) Shovelnose Sturgeon had been surgically implanted with Vemco® V13 acoustic transmitters (roughly 2.5-year life span). These fish are monitored continuously using approximately 20 Vemco® VR2W-69kHz coded acoustic passive receivers affixed to the bottom of the reservoir. Additionally, from June through October 2017, telemetry crews used VR-100 active tracking system to get bi-weekly accounts of Shovelnose Sturgeon.

Active tracking telemetry crews were able to get habitat use information on 70 unique fish observations through the 2017 tracking period. Preliminary results of the active tracking effort showed that Shovelnose Sturgeon used deeper pools (4.48 m., 0.13 m Standard Error) with little bottom current (1.44 m/s average, 0.52 m/s Standard Error). Moreover, there were no significant trends in Shovelnose Sturgeon habitat use over time.

All transmitters have reached the end of their battery life as of February 2020 and analyses are ongoing. Final results from the telemetry portion of the study will be summarized and provided in the final project report and submitted to a peer-reviewed journal. Preliminary survival analyses suggest that monthly and yearly mortality of adult Shovelnose Sturgeon in Lake Sharpe is less than 10%. For example, 92% of the Shovelnose Sturgeon implanted with transmitters in 2017 and 93% of the fish tagged in 2018 were detected alive > 1-year post release. Two individuals from the 2017 tagging cohort and one individual from the 2018 tagging cohort were detected alive within two months post-release and were not detected for the remainder of the tag-life period. Movement histories for tagged

Shovelnose Sturgeon suggest that tagged fish primarily utilize the upper portions of Lake Sharpe with very few detections occurring in the lower half of the reservoir (Figure 1).

Following the 2018 sampling season, all Shovelnose Sturgeon pectoral fin rays have been mounted and ageing has been completed. A total of 371 Shovelnose Sturgeon were aged using sectioned pectoral fin rays. Reader agreement of Shovelnose Sturgeon pectoral fin rays was poor (CV range 15 – 38%) but within ranges published for other populations. Shovelnose Sturgeon recruited to the gears used at a relatively old ages of 20-28 years dependent on the ageing protocols used. The Lake Sharpe Shovelnose Sturgeon population appears to be older than others described in the Missouri and Mississippi River populations. In fact, estimated Shovelnose Sturgeon ages were older than those previously thought as an age maximum for Shovelnose Sturgeon (Max age = 50). Catch-curve analyses suggest that the Lake Sharpe Shovelnose Sturgeon population exhibits low annual mortality at less than 8% yearly similar to the estimates derived from telemetry detections. Growth appears reduced compared to populations in the Mississippi River but similar to other populations in the Missouri River basin. Recruitment was consistent with few missing year classes but variable within the year-classes present. However, recruitment was unapparent in recent years with few fish younger than 20 years being captured. A detailed report of these findings has been formatted for a peer-reviewed journal and are awaiting final submission.

OKLAHOMA

MICRA Paddlefish and Sturgeon Committee – March 2021
OK State Report - Oklahoma Department of Wildlife Conservation

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1) Paddlefish Collections
   a) Winter Netting 2020-21
      i) Grand Lake, Hudson, and Ft. Gibson – lower catch rates. Movement patterns might be in transition after several years of high recruitment and a now younger stock.
      ii) Eufaula Lake – low abundance (restoration stock). Just beginning our evaluation of recovery.
2) Angler harvest – Spring 2020
   a) PRC shut down due to Covid
      i) Only checked in 73 fish
      ii) Little pressure during peak fishery
      iii) Collected eggs in the Neosho River to confirm spawn
      iv) Summer snagging increased with use of Live Scope

3) Two new world record paddlefish snagged from Keystone Lake
   a) 146 lbs and 151.9 lbs (tagged by C. Paukert in 1997)
   b) Garmin Live Scope usage is expanding
   c) Prominent guides are promoting C&R of trophy fish, but guide industry (and pressure) may be expanding.

4) Harvest Management
   a) New regulation changes for 2022 harvest year
      i) Rescind Monday and Friday catch and release days
      ii) Allow snagging at Arkansas River Zink Dam (Tulsa)
5) Research published in 2020
   a) Epidemiology of Polypodium
   b) Intersex Paddlefish (observed 2 in 2019)
   c) Positive Phototaxis of Paddlefish Larvae
   d) Bowfishing in the United States
6) Current Research 2021
   a) Working on multiple manuscripts for completion in 2021
      i) Age validation in OK
      ii) Rostrum Amputation
      iii) Dentary Microchemistry

   b) OK State Univ. investigating factors influencing restoration success in OK Reservoirs, recommendations on future restoration sites
   c) OK State also looking at side-scan sonar for abundance estimation
7) Future Research 2021 and beyond
   a) Continued examination of Polypodium
   b) Funding a review of fishing guide industry in OK. Possible revision of guide quals, permitting, costs, reporting, and accountability. Using paddlefish and striped bass as case-studies in the statewide review.

Shovelnose Sturgeon
USACE is replacing derelict Zink Dam on the Arkansas River with a newer, Obermeyer style dam that should theoretically be operated in a way to allow for spawning movements. Dam operations plan is still in development.

No movement on additional low-water dams on the Arkansas River; USACE has yet to issue the 404 permits (despite having issued 401 permits). Operating plan is required to address fish passage and egg/larvae movement. Discussions are ongoing and ODWC has maintained opposition to the structures on behalf of Shovelnose, Paddlefish, American Eel, and other migratory fishes.

PENNSYLVANIA

Brief History of Pennsylvania Fish and Boat Commission (PFBC) Paddlefish Management – information obtained from Lorson et al. (2015)

Paddlefish were originally widely distributed throughout large rivers of the upper Ohio River basin, including the Allegheny, Clarion, Kiskiminetas, Monongahela, and Ohio rivers in Pennsylvania, as well as Lake Erie. However, they have been considered extirpated from the state since the last known collection record made by Fowler in 1919 at the confluence of the Kiskiminetas and Allegheny rivers. The demise of Paddlefish here and throughout its range can be attributed to river gravel dredging, impounding by navigation dams, and water quality degradation.

In 1990 the PFBC Division of Fisheries Management Area 8 determined that Pennsylvania's western rivers could support Paddlefish once again and in 1991 the PFBC began stocking fingerling Paddlefish in the Ohio and Allegheny rivers as part of its "Paddlefish Restoration Plan". For 20 years (1991-2011) the PFBC raised and stocked over 158,000 fingerling Paddlefish in selected pools of the Ohio and Allegheny rivers. The PFBC stocking program was terminated in 2011 due to perception of hatchery disease and budget issues. In addition to our stocking program, New York began their Paddlefish stocking program on the upper Allegheny Reservoir in 1998. New York discontinued stocking Paddlefish in the Allegheny Reservoir in 2015.

Efforts to document the success of this stocking program were initiated in 2005. In 2005, California University of Pennsylvania (Cal U) deployed gill nets in the Allegheny River and actively captured the first Paddlefish resulting from the PFBC's reintroduction program. Subsequent sampling events of 2011 and 2012 by Cal U produced other sub-adult, adult, and a single larval Paddlefish, largely in those navigable reaches most heavily stocked by the PFBC. These surveys suggested that the Paddlefish populations in the Allegheny and Ohio rivers remained small and insubstantial. A number of interrelated factors likely limit the development of self-sustaining populations – mortality/size of stocked fish; habitat, flow, and temperature regimes; and riverine connectivity (Argent et al. 2009).

Argent, D.G.; W.G. Kimmel; R. Lorson; P. McKeown; D.M. Carlson; and M. Clancy. 2009. Paddlefish restoration in the upper Ohio and Allegheny River systems. Pages 397-410 in C.P. Paukert and G.D. Scholten, editors. Paddlefish management, propagation, and conservation in the 21st Century: building from 20 years of research and management. American Fisheries Society, Symposium 66, Bethesda, Maryland.

Lorson, R., B. Ventorini, and M. Depew. 2015. Paddlefish (Polyodon spathula) Restoration and Management Plan for Pennsylvania: 2016 and Beyond. Final Report for State Wildlife Grant T2-10-R-1: Paddlefish Population Status, Abundance, and Restoration, 2011 to 2014.

As I mentioned during the conference call, PA does not have a viable Paddlefish population nor do we have a recreational fishery. We do not conduct targeted Paddlefish surveys at this time. On rare occasions, we have received reports of an angler catching a Paddlefish as well as a dead Paddlefish found in the Ohio or Allegheny river. An angler that catches a Paddlefish in PA must release the fish back in the river (our regulation for Paddlefish is closed season yea-round).

Gary A. Smith | Area 8 Fisheries Manager
PA Fish & Boat Commission

Division of Fisheries Management
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TEXAS

Paddlefish are still listed as a state threatened species in Texas.

The Texas Parks and Wildlife Department has been assisting U.S. Fish and Wildlife Service with a paddlefish restoration project in northeast Texas on Big Cypress Bayou and Caddo Lake. We are currently in year 4 of a 10-year restocking plan. In addition to stocking, there are prescribed environmental flow releases from Lake O' the Pines, which is the reservoir upstream of the restoration area. COVID-19 prevented much field work in 2020, but we are hopeful to get back in the field this year to continue work on the project.

I'm looking forward to attending the committee meeting on March 4th.

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WEST VIRGINIA

Report to the MICRA Paddlefish and Sturgeon Committee
West Virginia
2020

West Virginia Division of Natural Resources (WVDNR) is still working with West Virginia University on a Paddlefish population assessment of the Ohio River along with a movement component. The population assessment will encompass the entirety of WV's jurisdiction of the Ohio River and the acoustic telemetry component will focus on the R.C. Byrd pool. Activities in 2020 were severely limited due to Covid-19 restrictions. No fish were implanted with acoustic transmitters. A total of 87 Paddlefish have been captured for this assessment. Below are the details for 2020:

- 2020 Paddlefish Gillnet Sampling:
    - From March to April, 7 sampling sites yielded 29 paddlefish. Mean EFL was 896.7 mm (35.3 in). Of these fish, 11 were female, 18 were male. 24 were newly jaw tagged. 2 were re-captures. 6 were deceased and had jawbones removed for aging. Ages still to be determined.