

MISSISSIPPI INTERSTATE COOPERATIVE RESOURCE ASSOCIATION

PADDLEFISH & STURGEON COMMITTEE

MEETING MINUTES & STATE REPORTS

29 March 2022

Powder Valley Conservation Nature Center, St. Louis, Missouri

COMMITTEE MEETING MINUTES

29 MARCH 2022

WELCOME/INTRODUCTIONS/OPENING REMARKS

The meeting was called to order at 8:30 am by Ryan Hupfeld 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 Iowa: Ryan Hupfeld

Assistant Chair: Vacant

Committee Delegates: Joe McMullen (MO), Sara Tripp (IL), Robby Maxwell (LA), Katie Zipfel (WV), Kirk Steffensen (NE), Sarah Molinaro (IN), Jason Sorensen (SD), Allison Asher (AR), Jessica Morris (KY), Steve Rider (AL), Tim Bister (TX), Eric Ganus (TN), Jason Schooley (OK), Nick Kramer (KS), Luke Etchison (NC), Mike Clancy (NY), Mike Backes (MT), Nick Schlessner (MN),

MICRA Coordinator: Greg Conover (USFWS)

Guests: Nathan Nye (WI), Amanda Lamberson (USFWS), Dave Herzog (MDC), Jorge Villavicencio (USFWS), Kayla Kimmel (USFWS), Matt O'Hara (IL), Trish Yasger (MDC), Dennis Scarnecchia (University of Idaho), Michael Moore (USGS/ISU), Chris Brooke (MDC), Luke Isenberg (MDC), Michelle Turton (USFWS)

OLD BUSINESS

2021 Meeting Minutes

Approved by a vote of silence. None opposed

Chair Report- Ryan Hupfeld

Ryan and Greg attended the MICRA Executive Board Meeting in February. Ryan provided an update to the Board on overall committee and upcoming meeting with topics we may discuss, an update on Commercial Fishing Workgroup status, an update on the overview of Dennis Scarnecchia proposal for a potential range wide Paddlefish Management Framework/Plan development, and reviewed the MICRA Priorities Document as it relates to the committee. We will touch on Priorities throughout the rest of the meeting.

Paddlefish Tagging Database-

MICRA Priority Document: Continue to coordinate and manage a basin-wide coded-wire tag database for paddlefish

Ryan Hupfeld updated the group on the Paddlefish Tag Database and where we ended on this topic last time. Given the current use of the database, an overhaul of the database was not currently needed. Still a back log of data so 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. SD has a backlog of CWT data, OK has not been entering data into database. Greg suggested to determine how much of a backlog there is.

Ryan Hupfeld will send query for Paddlefish Tagging Database along with what has been entered into database already- Do you have a data backlog?

***It was decided that a discussion about the database needs to occur but should be tabled until the Paddlefish Framework is developed to provide some direction on what is needed from the database.**

Paddlefish Basinwide Framework Development-

MICRA Priority Document: Develop a basinwide management plan/framework for Paddlefish

Ryan provided an overview of Dennis Scarnecchia’s proposal to assist the Committee with development of a basinwide framework. See proposal below:

Convene and facilitate a Working Group within MICRA to develop a comprehensive, multi-state Paddlefish Management Framework seeking and identifying commonalities among agencies for recreational and commercial fisheries management, species conservation and restoration.

This is a proposed multi-state effort among state managers in MICRA states in consultation with the U. S. Fish and Wildlife Service, other federal and tribal agencies and other interested parties. The framework plan will be designed to articulate philosophies, consistent or reconcilable policies, and relevant goals and objectives for sustaining the stocks and providing for species conservation, public benefit, and sound long-term public policy. Factors to be considered in the plan include the structure and roles of the commercial and recreational fisheries where sustainable, the roles of hatchery production and wild fish, relevant inter-jurisdictional issues, riverscape-level habitat issues, and broad enforcement issues. Older versions of a framework plan and regional plans previously developed by MICRA will be used as a starting point for a revised Framework Plan. This effort is viewed as a first step for more specific future collaboration in data collection, stock assessments, and cooperative management for species conservation. The plan will be designed so that multi-agency, inter-jurisdictional cooperation is volitional, but naturally and mutually beneficial. The management program will not dictate any specific state-level policies but will serve as a guide for harvest management approaches, research, outreach, and enforcement for the Paddlefish stocks and fisheries nationwide. Over the two-year period, the states and the Project Liaison will work together through MICRA on plan development. The Project Liaison has in the past assisted in the drafting of management plans for recreational fisheries in three states (MT and ND (interstate plan) and OK (state plan)).

Timeframe July 1, 2022- June 30, 2024

Project facilitator: Dennis L. Scarnecchia paid through an individual contract as consultant to MICRA. Address: D. Scarnecchia, PO Box 3192, Moscow, ID 83843.

Budget

Dennis L. Scarnecchia	12,000	12,000
IT and graphical assistance	3,250	3,250
Travel (Air)	1,500	1,500
Per Diem	600	600
Vehicle	700	700
Telephone	Provided	Provided
Laptop	1,400	
Total Costs		37,500

Discussion notes:

Dennis Scarnecchia added that he knows the development of this document will take a lot of time; time that the agency folks don't have to make this happen. He is interested in facilitating the 1-on-1 discussions, conference calls, and helping to develop the draft document. The states can be more effective if they can work together and have common ground in a basinwide management approach.

Question to Dennis: How do you envision this moving forward? Small working group with representation from each sub-basin to discuss content. Dennis' role will be assembling information into a draft document. Not a coercive effort, just facilitating the states' effort.

This proposal was discussed among the group with a lot of interest from states (responses below):

- Jessica Morris - KY- In favor
- Joe McMullen - MO- In Favor
- Sarah Molinaro - IN- very helpful- In Favor
- Eric Ganus -TN- has dated plan joint plan with AR and MS- Needs updated- Rec and Commercial aspects included- Should've done in 2006- In favor
- Tim Bister - TX- no fishery- In favor and will help where he can
- Robbie Maxwell- LA- Very limited fishery- sees utility- In favor and will help anyway he can
- Nate Nye - WI- Supportive- No recreational or commercial fishery- paddlefish populations in MS and some larger tributaries. Biologists encounter paddlefish. WI can help and share data. Another important topic for WI is standardized data collection plan- what they should be collecting and how to collect data. This would be very helpful for WI.
- Jason Schooley - OK- supportive
- Kirk Steffensen - NE- No management plan currently- drafting a new one currently- sport fishery- Supportive and will help
- Luke Etchison – NC- supportive
- Allison Asher - AR-supportive
- Katie Zipfel - WV- supportive
- Nick Kramer - KS-Developed plan- alternative fishing plan- has not been approved yet (draft)- Supportive
- Jason Sorensen - SD- Supportive- pops in reservoirs
- Sara Tripp - IL- supportive

Any concerns from anyone?- None

Ryan will bring this to the MICRA Executive Board for approval for funding

Keep moving forward- July timeframe to get started

A workgroup was developed with volunteers:

- Ryan Hupfeld- IA DNR
- Greg Conover- USFWS
- Eric Ganus- TN
- Trish Yasger- MDC
- Jason Schooley- OK
- Sara Tripp- IL
- Kirk Steffensen- NE
- Katie Zipfel- WV
- Nate Nye- WI following discussion with bureau

Ryan will send out workgroup email to get everyone together and Dennis can start the process of developing a plan to complete the framework.

Commercial fishing workgroup update and next steps

Greg provided an overview of the committee, its progress, and next steps. The MICRA Executive Board requested a written summary of the project with recommendations prior to the board's August meeting. The workgroup is currently drafting this report and expected to have first draft by June-July.

NEW BUSINESS

Mississippi Yangtze River Interbasin Symposium-AFS- Michael Moore (USGS/ISU)

Mississippi River/Yangtze River Interbasin Symposium at the Annual AFS Meeting in Spokane, WA from August 21-25, 2022. Please submit any abstracts if you have any relevant presentations.

MICRA Priority Document: Standardizing methods for documenting and reporting harvest data for paddlefish

Is this still a priority and will the framework cover this?

- Joe- MDC- PADDLEFISH Framework- Yes it is a priority
- Dennis- Yes framework plan would cover this
- Sara- PADDLEFISH – include more species in the future- sturgeon
 - Dennis agrees with Sara

Committee sees this as a priority- will be addressed in the framework

MICRA Priority Document: Basinwide commercial harvest databases for paddlefish and sturgeon including roe harvest and roe buyers

Is this still a priority and will the framework cover this?

- Michelle Marron is still working on this for UMR States.
- Joe M.- has brought this up with LMRCC it but this has not gained traction in LMR - accuracy and utility were concerns
- Dennis S.- Worked on alligator harvest tracking- state documentation and then entered into federal system- all the way through the processing. Dennis has ideas for framework- lots of hope in the area and is not as complicated as others think. Already a precedent in this area for others such as alligators.
- Should work with Michelle Marron for ideas/recommendations moving forward
- LMRCC/UMRCC talk about this?- LMRCC fish tech sees it as a need let's try to move this forward
- Jessica- KY sounds good
- Joe is chair of LMRCC fish tech and will help facilitate conversation. Need to restart this effort and touch base with other states again to try and get this going.

This is a priority and can be handled through development of framework plan

Other discussions on this topic:

- Greg- Who's going to manage databases once we have them? Lot of work. Don't be hemmed in by what the resources we have now, but develop it based on what the needs are. Fish commission? More examples we have of priority needs that we don't currently have the resources to address will help MICRA when the partnership is working to get support for a fishery commission to bring resources to interjurisdictional management to the basin. If there are needs let's identify them. Fish commission would have their own staff and could potentially be responsible for management of the databases.

- Sara T.- Framework could develop same data sheets and data entry framework so it is easy to enter and manage
- Joe M. and Allison Asher- AR has an electronic reporting system- Silvics Solutions- Commercial fishing and roe harvest
 - Sara T.- Glover is looking into electronic reporting (Real Time Research)
 - IN would be interested in electronic reporting
- Does CITES compile harvest information requested from the states each year?-
- **Joe will draft a request to CITES for a compilation of the states' annual Paddlefish commercial harvest.**
- **Ryan will submit the draft letter to the MICRA chairman with a request for the letter to be sent by MICRA on behalf of the committee.**

Website Updates

Greg- What does the committee want on the website? What is your input for what is on the website?

- Ryan- Old documents, meeting minutes, stocking protocols, current regs and harvest reporting forms, etc.
- Joe- Other states plans in one spot would be helpful. Needs to morph beyond paddlefish and sturgeon
- Greg- Website only has paddlefish documents, there is no information on sturgeon
- Dennis- reflects well on the states if it is updated at reasonable intervals
 - Include this as a recommendation in framework plan
- Joe- Annual adjustments to regulations to keep up to date.
- Ryan- Who manages the website? Greg C. does
- Open to any input on what people would like to see for layout and content! Send anything you want uploaded to Greg.

Next steps for committee

Priorities and Emerging Issues for 2024-2028:

- What do we think is important moving forward that we need to address?
- Development of new priorities document
- Other needs/priorities we would like to include?
- Inter-jurisdictional sturgeon needs?
- Others?

Current MICRA Priorities:

- Support continued efforts for coordinated basin-wide management of paddlefish and sturgeon species.
- Develop a basinwide management plan for paddlefish.
- Continue to coordinate and manage a basin-wide coded-wire tag database for paddlefish.
- Provide recommendations to the Executive Board for standardized methods for documenting and reporting harvest data for paddlefish.
- Provide recommendations to the Executive Board for basin-wide commercial harvest databases for paddlefish and sturgeon, including roe harvest and roe buyers.

Potential Future Priorities Discussed:

Shovelnose Sturgeon-

- Commercial and recreational harvest management and regulations- consistency
- Exploitation
- Life history/population demographics
- Age/Growth data- Fin rays are inaccurate
- Framework for shovelnose sturgeon?

Lake Sturgeon-

- Bycatch of lake sturgeon- how to document this consistently
- Data collection basin-wide- How to do this and how to make it useful?
- Stocking evaluations?- MO has lake sturgeon management plan
- How to stock and evaluate?
- Genetics
- How many to stock?
- Query of states on lake sturgeon management in each state
- Stocking, genetics, tagging, research projects, etc.
- Framework document for lake sturgeon?

Ageing of Paddlefish and Sturgeon spp.- Developing accurate ageing techniques

- Microsatellite genetic analysis
- Bomb radiocarbon analysis/DNA methylation

- Mark/Recapture analysis for growth, survival, longevity, etc.

Tagging coordination among agencies- Basin wide tagging strategy?

- CWT evaluation in fish captured? Is it being done? Any recommendations for tagged fish captured?
- PIT tagging preferred?
- PIT, CWT, etc.
- Tagging locations (on fish and in basin)
- Metadata associated with fish and location
- Acoustic telemetry

GSI/Fecundity stages in Mississippi River Basin of Paddlefish and Sturgeon spp.

- Prime spawners

What do we want to work on now and in the future?

Immediate:

- Paddlefish Framework- Dennis S. and working group
- Commercial Harvest Workgroup Summary Report- Commercial harvest workgroup- June/July
- Lake Sturgeon information compilation?
 - **Ryan will reach out to Kyle Bales for info.**
- Compiling Sturgeon spp. and Paddlefish tagging information
 - Types of tags, locations, etc.

Future:

- Sturgeon spp. Framework
 - Would lead into other projects previously listed
- Ageing of Paddlefish and Sturgeon spp.- Developing accurate ageing techniques
- Maturity schedule of Paddlefish and Sturgeon spp.- added after discussion in commercial fishing workgroup meeting
- Sub-basin Paddlefish management plan updates

Emerging Issues:

- Major changes in the ecosystem (e.g., invasive species, habitat changes, habitat rehabilitation/enhancement, etc.)
 - Influences on paddlefish/sturgeon spp.?

- Recruitment
 - Reservoir environments are changing
- Hydropower
- Aquaculture of non-native species
 - Sterlet Sturgeon
- Sturgeon/Paddlefish domestication
 - Hatchery vs. wild fish fitness
- Polyploidal deficiencies in Sturgeon in TN- **Eric will send out information on this**
- Technological advances in fishing equipment
 - Increase in harvest on an increased timeline?
 - What is fish managers ability to respond?
 - Information transfer technology (social media) is much more rapid now
- Lake Sturgeon ESA Listing- Request update from FWS
- Paddlefish/Sturgeon bycatch of other commercial fisheries (i.e., buffalo/carp harvest)

CHAIR ELECT

Ohio River Basin is on for the next rotation. **Sara T. (IL), Jessica M. (KY), and Katie Z. (WV)- Will follow up with each other to decide who will be the next chair of the committee**

ACTION ITEMS

- **Ryan-** Send query for Paddlefish Tagging Database along with what has been entered into database already- Do you have a data backlog?
- **Ryan-** Send budget out for Paddlefish Management Framework out
- **Ryan and Greg-** Bring the Paddlefish Framework to the Executive Board
 - How quickly can they approve?
 - **Ryan-** Send out workgroup email to get everyone together and Dennis can start the process of developing a plan to complete the framework
- **Ryan-** Circle back with Nathan Nye from WI about filling WI's state rep on the group
- **Joe M.-** Send request to CITES on annual Paddlefish commercial harvest
- **Ryan and Greg-** Look at landing page content for website and ask committee for input
 - Determine the needs to go on to the website
- **Ryan-** Reach out to Kyle Bales for lake sturgeon state management information
- **Eric-** Will send out information on ploidy issues with lake sturgeon
- **Sara T., Jessica M., and Katie Z.-** Will follow up with each other to decide who will be the next chair of the committee

- **Joe M.**- Will send Ryan most up to date regulation table to send to group and request an update
- **Joe M.**- Will look up and forward on tagging request information- What each state is tagging, where, species, etc.
- **Joe M. and Ryan**- Reach out to Michelle Marron about how she compiles UMR commercial harvest reporting data
- **Ryan**- Type up meeting minutes and send PowerPoint to the committee
- **Ryan**- Send out membership directory to committee for updates
- **State Reps**- Send state reports to Ryan Hupfeld- ryan.hupfeld@dnr.iowa.gov

STATE REPORT UPDATES

Written state reports attached (below)

ADJOURN

Ryan Hupfeld adjourned the meeting at 4:30 pm.

STATE REPORTS

Arkansas- Allison Asher

The Arkansas Game and Fish Commission Paddlefish and Sturgeon Management Plan was approved 2021. The plan guides the management of Paddlefish and Sturgeon within the state through 2026. As part of the management plan, biologist continue to monitor water temperatures via temperature loggers in rivers that support major Paddlefish fisheries in Arkansas.

An angler caught a Lake Sturgeon in January 2022 at the confluence of the Black and Springs Rivers in Northeast Arkansas. This is the second confirmed record of Lake Sturgeon from the Black River system in recent years. Another Lake Sturgeon was captured by a commercial fisher in January 2019, approximately 9 km downstream of the confluence of the Black and Spring Rivers. Both fish were released alive. Records of Lake Sturgeon in interior waters of Arkansas are rare.

Indiana- Sarah Molinaro

Indiana had no licensed inland river roe harvesters in 2020 and 2021, and there was no Shovelnose Sturgeon harvest in the Wabash River from October 1, 2020 – May 31, 2021. Indiana had 3 and 2 Ohio River roe harvesters licensed in 2020 and 2021, respectively. They harvested 431 Paddlefish totaling 12,833 lbs, and 1,640.3 lbs of screened Paddlefish eggs from November 1, 2020 – April 30, 2021. There was one roe dealer in both 2020 and 2021.

We completed our annual Shovelnose Sturgeon monitoring in the Wabash River. The project has been ongoing since 2005, and we've tagged 19,357 Shovelnose to date. In 2021 we drifted experimental gill nets near Lafayette, Indiana in May, and near Crawleyville, Indiana in September. We caught 870 Shovelnose Sturgeon, including 66 recaps that were initially tagged in 2021, and 33 recaps that were at large for at least 1 year. The average time at large was 4 years, and the oldest recap was at large for 13 years since it was initially tagged.

In 2021 we proposed closing commercial harvest of Shovelnose Sturgeon on Indiana's inland waters (Wabash, Patoka, White rivers). We only received one comment during the public comment period, and the proposal is continuing to move through our rule making process.

Iowa- Ryan Hupfeld

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 in Pool 13 substantially since 2011 (i.e., twenty-nine-year median- 2.79 fish/haul, median for years 1993-2009- 2.08 fish/haul, median for years 2010-2021- 7.35 fish/haul; Figure 2). Commercial overharvest of mature females appears to be the

primary factor that was affecting the reduced natural recruitment. Seeing very similar trends in Age-0 Shovelnose Sturgeon catch rates.

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

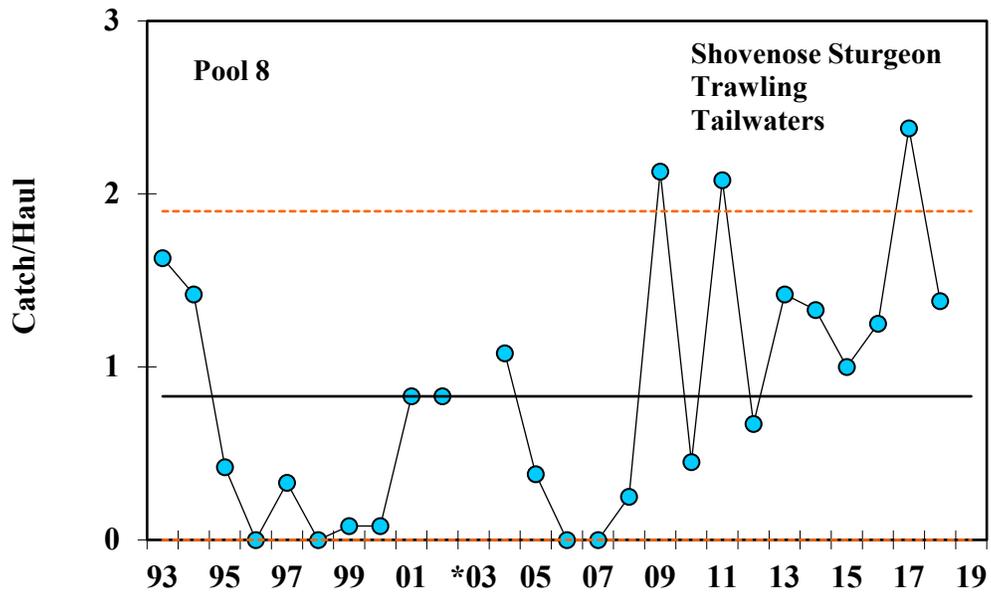


Figure 1. Trends in mean catch per unit effort (CPUE; circles), with 27-year medians (solid line) and 10% and 90% percentiles (dashed lines) of Shovelnose Sturgeon in Pool 8 tailwater trawling used in LTRM sampling, 1993-2019 with 27" minimum length limit in place.

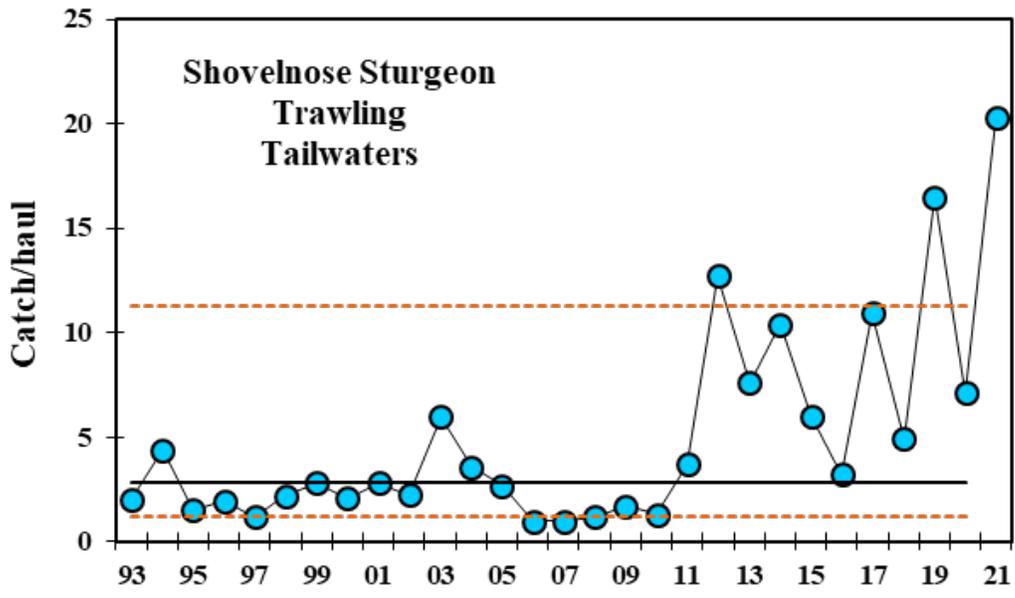


Figure 2. Trends in mean catch per unit effort (CPUE; circles), with 29-year medians (solid line) and 10% and 90% percentiles (dashed lines) of Shovelnose Sturgeon in Pool 13 tailwater trawling used in LTRM sampling, 1993-2020 with 27" minimum length limit in place.

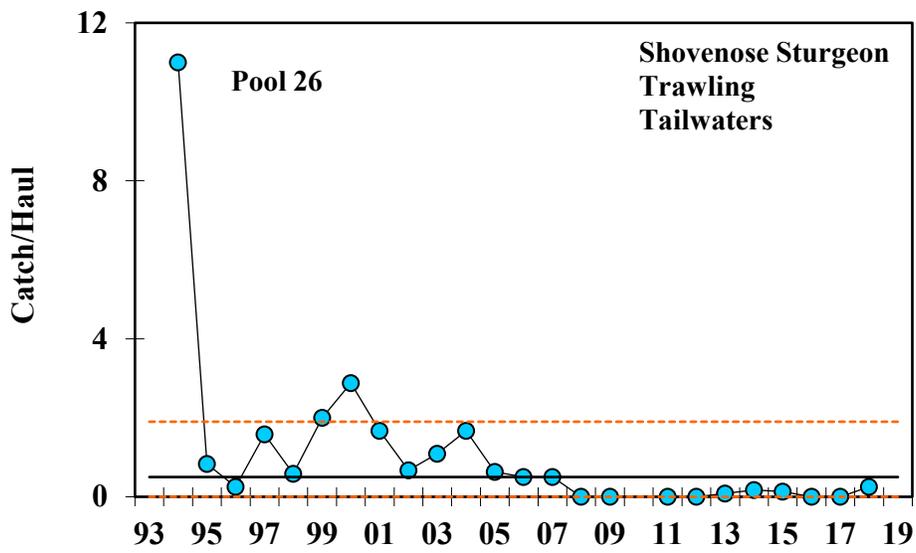


Figure 3. Trends in mean catch per unit effort (CPUE; circles), with 27-year medians (solid line) and 10% and 90% percentiles (dashed lines) of Shovelnose Sturgeon in Pool 26 tailwater trawling used in LTRM sampling, 1993-2019 with no minimum length limit in place.

Shovelnose Sturgeon Cedar River:

- 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
 - Currently conducting bomb radiocarbon analysis to get a better idea of actual longevity and growth of the species and population
 - Otoliths are very small (0.167- 4.947mg) and fragile, which made processing very challenging
 - Were able to get “readable” sections with annuli
 - Otolith cores are at the lab being processed currently

Larval Drift of Scaphyrincus spp. in the Des Moines River

First year 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 *Scaphyrincus* 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 *Scaphyrincus* spp. and Paddlefish natural reproduction via targeted flow releases.

- Although very intense and labor intensive, we had a successful first year of sampling
 - Working with the USACE we were able to implement two minor flow pulses from Red Rock Dam
 - 4 Shovelnose Sturgeon larvae captured (Figure 4)
 - Captured a flowing female at Ottumwa on 5/11/21
 - 3 on 5/20/21 at 3 different sites (7-8mm)
 - 1 on 6/1/21
 - All were estimated to be ~18-24 hours old (10mm)
 - ~3-5 days to hatch
 - Potential spawning dates: 5/15-5/17 and 5/27-5/29
 - Both dates of capture following one of the flow pulses
 - Low water year = low reproduction
 - Sampled sturgeon on the Cedar throughout the summer that were reabsorbing eggs
 - Hopefully higher water in future years to see changes in catches
- SRP is coming to the Iowa River in future years

- Overall, a really good collaborative project with the USACE, TNC, Iowa DNR fish mgt., and Iowa DNR wildlife bureau

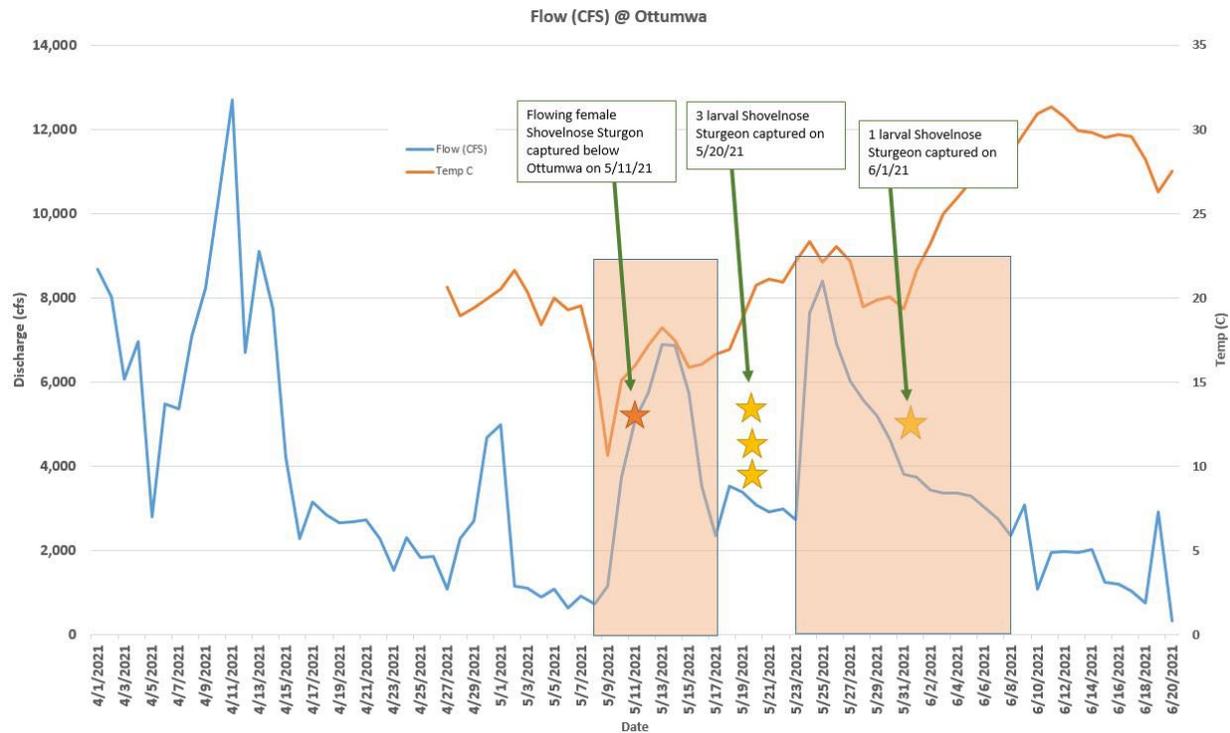


Figure 4. Hydrograph at Ottumwa, IA with experimental flow pulses (shaded in orange), date of flowing female captured (orange star), and dates of larval fish captured (yellow stars)

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

Worked with Iowa State University and United States Fish and Wildlife Service to develop an acoustic telemetry array in the Des Moines (N=17) and Cedar and Iowa (N=12) rivers. Acoustic receivers were mounted on various bridge piers in strategic locations. This spring, we will begin implanting acoustic transmitters into Shovelnose Sturgeon to evaluate movement patterns and residency. N=25 in the Cedar/Iowa rivers and N=25 in the Des Moines River.

Kentucky- Jessica Morris

Lake Sturgeon

Culture— Fry were received from Warm Springs National Fish Hatchery on 5/26/2021. Fry were in good condition upon arrival. A total of 10,475 fry (2,873/lb. and 1.34 inches long) were provided from the Wolf River in Wisconsin. Fry were moved directly into round tank inserts (approximately 250 gallons) before being moved into 500-gallon round tanks and 1000-gallon raceways. Sturgeon was cultured in a RAS (Recirculating Aquaculture System). With this system we have the capability to control our

temperature below 75°F, this allowed for better growth by keeping the sturgeon in their optimal temperature range. We continued to use the same culture methods that we have used in previous years. Starting the fry off with artemia and then transitioning to other foods: Otohime and frozen bloodworms (BW), and frozen krill. Decapsulated artemia were fed to minimize the amount of time that feeding took at night. Our overall survival was ~98.1% from fry. On August 5, 2021, 5,020 fish averaging 35.3/lb. and 7.15 inches were stocked at the Mouth of Laurel River boat ramp and 4,785 fish averaging 41.2/lb. and 6.0 inches were stocked at Alum Ford boat ramp. Total lake sturgeon stocked in 2021 was 9,805. The fish had the right 1st and 2nd scutes removed. The total number of lake sturgeon stocked to date is 66,689.

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 2021 a total of 36 trotlines, 24 in the Cumberland River and 12 in Big South Fork, were successfully set and retrieved. A total of 125 lake sturgeon were collected with a CPUE of 3.5 fish/line. One hundred one lake sturgeon were collected from the Cumberland River (CPUE=4.2 fish/line), and 24 fish were collected from the Big South Fork (CPUE=2.0 fish/line). CPUE in both the Cumberland River and Big South Fork 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-12. The take of Lake Sturgeon in Kentucky is not permitted.

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Shovelnose Sturgeon

Commercial harvest— Harvest of shovelnose sturgeon is permitted in waters open to commercial fishing in the Ohio River Basin by any legal commercial fishing method October 15th through May 15th. Gill and trammel net season in Barkley and Kentucky Lakes extends from November 1st through March 31st. The statewide size limit for shovelnose sturgeon is between 24 – 32 inches as measured from the tip of the snout to the fork of the tail. During the 2021 license year shovelnose sturgeon were reported harvested by nine commercial fishers and from only the Ohio River. Licensed commercial fishermen must report harvest monthly via a mail-in harvest log system, and record sale of roe-bearing fish daily on a 'harvesters transaction report'. Gill nets were the primary gear used to capture shovelnose sturgeon in the 2021 season accounting for 73% of fish reported. The remainder was made were harvested with hoop nets. During the 2021 – 2022 season a total of 222 shovelnose sturgeon were harvested from Kentucky waters accounting for 552 lbs of flesh and 116 lbs of roe. This is the lowest reported harvest of sturgeon since 2008 when KDFWR strengthened their reporting requirements for roe-bearing fish.

Paddlefish

Commercial harvest— Harvest of paddlefish is permitted by any legal commercial fishing gear type, except trotlines, November 1st through April 30th in all waters open to commercial fishing, except Barkley and Kentucky Lakes. Paddlefish harvest by trotline is permitted November 1st through May 31st in all waters open to commercial fishing except the Mississippi and Ohio Rivers. Gill and trammel net season in Barkley and Kentucky Lakes extends from November 1st through March 31st. The statewide minimum length limit on paddlefish is set at 32.0-inch eye-fork length. The minimum length limit on paddlefish in Kentucky and Barkley Lakes is 38.0-inch eye-fork length. Licensed commercial fishermen must report harvest monthly via a mail-in harvest log system, and record sale of roe-bearing fish daily on a 'harvesters transaction report'. During the 2021 license year thirty-six commercial fishers reported harvesting paddlefish in Kentucky. Similar to previous years, the majority of commercial harvest occurred in the Ohio River mainstem, accounting for 82% of the total harvest. Other waterbodies where commercial harvest was reported from included lake Cumberland (10%), Mississippi River (7%), Lake Barkley (<1%), Kentucky Lake (<1%), and the Cumberland River (<1%). Gill nets are the primary method of commercial harvest (90%), with trotlines and hoop nets also being reported. During the 2021 – 2022 season 3,552 paddlefish were harvested accounting for 66,732 lbs of flesh and 9,533 lbs of roe. This represents the lowest number of paddlefish and pounds of flesh harvested through the commercial fishery since 2008 when KDFWR strengthened reporting requirements.

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Louisiana- Robby Maxwell

Two NRDA projects 1. estimating abundance of juvenile Gulf Sturgeon, and 2. quantifying and documenting spawning habitat for Gulf Sturgeon in the Pearl and Pascagoula Rivers are still ongoing.

Recovery of the Gulf sturgeon (*Acipenser oxyrinchus desotoi*) population in Louisiana continues to be threatened by habitat alteration and limited access to critical spawning areas in the Pearl River. Despite the many habitat mitigation and marsh restoration projects being implemented in coastal Louisiana, habitat use of Gulf sturgeon has yet to be clearly defined in the estuary. Given the uncertainty of these activities to negatively impact Gulf sturgeon, both Ecological Services and the National Marine Fisheries Service have expressed the need for better information to help guide Biological Opinions and other ESA related assessments for these projects. Data deficiencies surrounding the habitat requirements of Gulf sturgeon, especially in terms of those that most influence the population, limit our ability to adequately inform management decisions and track recovery success. Biologists from the Baton Rouge Fish and Wildlife Conservation Office are collaborating with partners at Louisiana State University and the Water Institute of the Gulf to develop an informative and comprehensive assessment of the specific types of habitats that are important to Gulf sturgeon in Louisiana estuaries. Our work intends to identify specific criteria important to the recovery of this species by integrating spatially-explicit environmental and hydrodynamic modeling with acoustic telemetry observations. While this work is still ongoing the

culmination of this effort will provide the first available tool from which state and federal managers can interpret the relative importance of specific habitat types to Gulf sturgeon, and more appropriately design restoration projects that minimize impacts to this iconic species.

The Pearl River Navigation Canal is in the process of being transferred from USACE to the State of Louisiana. The removal of locks and sills will reconnect Gulf Sturgeon habitat in the Pearl Basin.

The Native Fish in the Classroom program, featuring Paddlefish, continued this year. Though brood stock netting was the most successful it has been in years, we were not able to spawn at the hatchery. The surface water source for the hatchery, Indian Creek Reservoir, was drawn down in 2021, and due to drought, did not rise in time to supply water for the hatchery. The educational day was held with Paddlefish as the focus, but the fish were released without spawning.

Broodstock for Big Cypress (above Caddo Lake in TX) were collected in the Red River. Natchitoches National Fish Hatchery currently has ~13,000 fry. The broodstock was collected in Pool 3 of the Red River, mostly around the Grand Ecore area. The 13,000 fry were from one female. Tishimingo hatchery in OK are spawning their Red River strain this week and some of those may be sent to NNFH for grow out.

Missouri- Joe McMullen

Lake Sturgeon (LKSG)

Management

- MDC and USACE staff are working together on two Sustainable Rivers Program projects.
 - Mississippi River, Mel Price Lock and Dam (#26) tailwater – This is where LKSG spawned in 2015. Sarah Peper (MDC) and Ryan Swearingen (USACE) have been catching and implanting LKSG with transmitters in the area and placing remote receivers in high-use areas and near the previous spawning grounds. USACE staff are also modeling flows and attempting to recreate conditions that match the 2015 spawning event. Also, the nearby boat ramp needs to be modified and USACE engineers are looking at ways to improve the spawning habitat further while replacing the boat ramp.
 - Salt River, Mark Twain Lake Reregulation Dam tailwater – LKSG were observed and/or captured here at spawning temperatures in 2019 and 2020. Travis Moore asked USACE staff for permission to post banners to educate area anglers and potentially sample for LKSG adults, eggs, or drifting fry. High water prevented those activities in 2021, but may get to occur in 2022. A site visit is planned for early April to adjust Reregulation Dam gates and to observe the conditions to see what may be most favorable to LKSG.

- Dr. Michael Moore completed his field work and report on the Osage River/Gasconade River LKSG project. MDC and USGS/University of Missouri Co-Op Unit staff submitted a PhD project to build on what Dr. Moore learned. Our hope is to pinpoint spawning sites, study the

characteristics, and potentially create more of that type of habitat. The project is slated to begin this fall, if approved.

- MDC staff were able to purchase a portable (ice fishing bundle) Garmin Live-Scope depth finder. The plan is to utilize it at potential spawning sites to see if LKSG are spawning at deeper depths than we can see. The portability will allow us to move it from boat to boat.
- The LKSG recovery and management plan is still being edited. The next draft is nearing completion and will be submitted to the Fisheries Section Chief soon.

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Culture & Stocking

Lost Valley Hatchery:

- Source and Number of Fish Received
 - 17,971 fry that were approximately 3 weeks old were received from Wild Rose Hatchery in Wisconsin on 5/28/21.
 - Fry were already on feed when received and no fecal plug was present. Began feeding hatched brine shrimp cysts immediately, then progressed to frozen adult frozen brine shrimp for the remainder of the season.
 - Lost Valley submitted samples to the LaCrosse Fish Health Lab in response to VHS being found at Wildrose in musky and initiated an SOP to completely isolate this lot of fish which continued until results came back. Results received from LaCrosse on 7/16/21 came back negative
- Produced and Tagged
 - On 7/23/21 Lost Valley stocked 2,866 surplus LKSG in the Missouri River - Osage (Mari-Osa).
 - On 9/21/21 staff tagged 11,020 fish were tagged then stocked 9/21-22/21.
 - These tagged fish were evenly stocked between the Missouri River/Osage (Mari-Osa) Missouri River/Gasconade (Rollins Ferry) sites.
 - From egg to <8" and >8" fish Lost Valley had a 77.2% survival rate in 2021.
- Stocking Locations and Number Stocked

Production <8"							
Requested Lake Name	# Requested	Total # Untagged Stocked	Total Lbs Untagged Stocked	Total # Tagged Stocked	Total lbs. Tagged Stocked	Total Stocked	Total Lbs Stocked
Missouri River - Gasconade (Fredricksburg)	2,500	0 f	.00 lbs.	0 f	.00 lbs.	0 f	.00 lbs.
Missouri River - Osage (Mari-Osa)	2,500	2,866 f	534.30 lbs.	5,542 f	172.55 lbs.	8,408 f	706.85 lbs.
Missouri River - Gasconade (Rollins Ferry)	2,500	0 f	.00 lbs.	5,478 f	169.05 lbs.	5,478 f	169.05 lbs.
Missouri River - Grand (Brunswick)	2,500	0 f	.00 lbs.	0 f	.00 lbs.	0 f	.00 lbs.
	10,000	2,866 f	534.3 lbs.	11,020	341.60 lbs.	13,886 f	875.90 lbs.

Literature Available: *2021 Lake Sturgeon Production and Stocking Report*

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Pallid Sturgeon (PDSG)

Culture & Stocking

Blind Pony Hatchery

Blind Pony Fish Hatchery transported and held no potential PDSG broodstock during the 2021 production year.

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Research

Habitat Assessment and Monitoring Program- Identifying and Understanding Areas of Enhanced

Capture: Missouri Department of Conservation personnel have been working with staff from USACE and USGS to identify and map areas with high interception of age-0 *Scaphirhynchus* spp. on the lower Missouri River. Objectives of this work are to better understand hydraulic and bedform conditions in river patches with high abundances of age-0 *Scaphirhynchus* spp. These “areas of enhanced capture” (AECs) are defined by benthic trawl samples with catch per unit area (CPUA) values of age-0 *Scaphirhynchus* spp. ≥ 15 fish per 100m² sampled. Bends were mapped using Acoustic Doppler Current Profiler (ADCP) equipment during the field season, with ongoing analysis to determine relationships with bedform, flow paths and vectors, and CPUA of age-0 *Scaphirhynchus* spp.

Fieldwork for 2020 and 2021 field seasons focused on sampling Salt Creek Bend (RM 212) during May and June of both years. Benthic trawling during June 2020 yielded 696 age-0 *Scaphirhynchus* spp., including one individual genetically confirmed as an age-0 hatchery origin pallid sturgeon. This individual was released upstream at ≤ 5 d post-hatch, as part of ongoing research into drift distance and survival of age-0 PDSG in the lower Missouri River. Genetic identification of age-0 *Scaphirhynchus* spp. collected between July and September 2020 is pending. Areas of enhanced capture were broadly defined as behind outside bend L-dikes, and within eddy lines of the inside bend dike field. Field sampling Salt Creek Bend during June 2021 yielded 854 age-0 *Scaphirhynchus* spp. ranging 14-64 mm total length (TL). CPAU ranged from 0-21.07 age-0 sturgeon per 100 m², and mean CPUA peaked in mid-June. Genetic identification of age-0 *Scaphirhynchus* spp. collected during the 2021 field season is pending. Areas of enhanced capture included trawl samples conducted in sandbar tail habitats, as well as within eddy lines of the inside bend dike field. Catch of age-0 *Scaphirhynchus* spp. remained high within the inside bend dike field, despite scouring and changes to bedform associated with refurbishment of dike structures during the 2021 field season. Captures behind outside bend L-dikes were low in 2021, likely due to lower river discharge, and reduced flow through outside bend L-dikes, when compared with the 2020 sampling

season. Inside bend and sandbar tail habitats also had broader length-frequency distributions of age-0 *Scaphirhynchus* spp. in 2021, compared with samples from outside bend L-dikes.

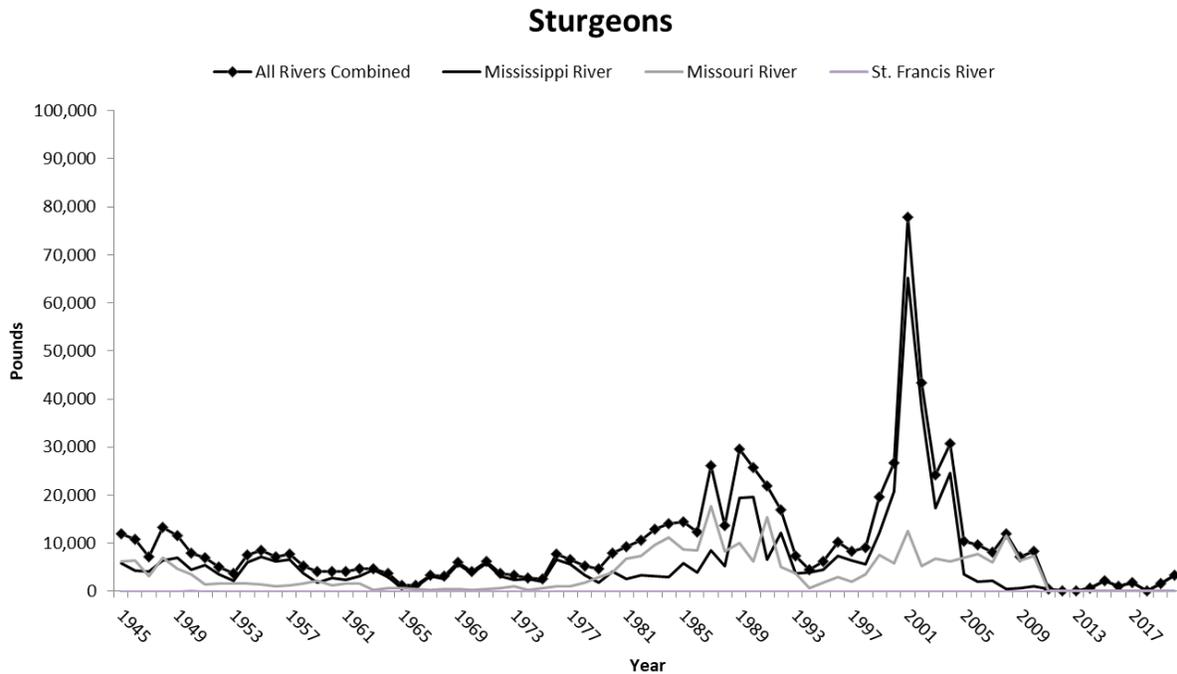
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Shovelnose Sturgeon (SNSG)

Commercial Fishing Program

Upper Mississippi River SNSG harvest increased from 1,671 lbs. in 2019 to 3,343 lbs. in 2020 (highest recorded harvest since 2010), consisted of 796 fish (average weight 4.2 lbs./fish), produced 427.18 lbs. of roe. SNSG harvest was nearly evenly split between Pools 24 and 25, and minimal harvest occurred from Pool 20.



Pounds of sturgeons commercially harvested, by river and from all rivers combined: 1945-2020.

Literature Available: *Missouri Commercial Fish Harvest 2020*

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Paddlefish (PDFH)

Management

Reservoir Snag Fisheries: The 2021 snagging season was good. Rains and high-water levels early in the season helped maintained good flows for most of the snagging season. Flooding on Truman made snagging challenging, until water levels dropped in April. With all the rains and good flows, 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), especially on Lake of the Ozarks and Table Rock Lake and provided some good snagging on the Marais des Cygnes River. We're continuing to see good snagging on the Lamine and Osage rivers. At times the high flows kept snaggers off the Mississippi and Missouri rivers and some of their tributaries. Snaggers caught a lot of sublegal fish from the extremely large 2016-year class, these fish should start becoming legal in 2023. The 2022 snagging season should be good. We continue to get complaints from "traditional" snaggers about those using dippy divers and now using live scope – complaints include damage to sublegal sized fish and releasing legal sized fish (which is not legal).



The Missouri Department of Conservation (MDC) congratulates Jim Dain of Pittsfield, Ill. for snagging a monster 140-pound, 10-ounce paddlefish March 18, 2022 at the Lake of the Ozarks. The latest record breaks the previous record of 140-pounds, 9-ounces set in 2015 on Table Rock Lake.

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Culture & Stocking

Blind Pony Fish Hatchery:

Broodstock: Hatchery staff collected Osage River broodstock on February 23rd and 25th, and the Truman Reservoir broodstock on March 4th. It continues to be seen that early collection offers several benefits including an increased timeline to collect needed broodstock, increased docility of PDFH due to the cooler water temperatures, and a decrease in pre-spawn mortality (0 in 2018-2021). Staff continue to use ultra-sound technology to identify reproductive broodstock which are mixed in with non-reproductive PDFH this time of collection. Using an ultra-sound device, staff can immediately identify the sex and maturity of male and female PDFH after they are removed from gill nets. Potential broodstock are kept, while all other fish are immediately returned to the water.



In 2021, a total of 38 broodstock PDFH were collected for spawning at Blind Pony Hatchery.

2021 Paddlefish Broodstock Numbers/Origins

- 2 females collected from Truman
- 9 males collected from Truman
- 19 females collected from Osage River
- 8 males collected from Osage River

Spawning: Seventeen female PDFH 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 mg/kg dose was injected 20 hours prior to expected ovulation. Sixteen males received .1 mg dose 32 hours prior to spawning which has long been proven to be sufficient for adequate sperm

production. Seventeen 1:1 PDFH male x female crosses were attempted. Two of the males were used on two females each due to two other males not producing sperm. Two females either did not produce eggs or the eggs did not fertilize.

Decisions on specific male x female crosses were made at random. In total, 1,705,021 eggs were produced from 15 females and 15 males. An 81% hatch rate was achieved for a total of 1,375,896 fry.

- 1,705,021 eggs were collected
- 1,375,896 hatched
- 81% Hatch
- 1,162,538 fry stocked

Production: 17.1-acres of earthen ponds were used for fingerling production of PDFH. Ponds were filter-filled and fertilized two weeks prior to fry stocking.

Fry were stocked at a rate of 50,000 per acre. In total, 1,162,538 fry were stocked into Blind Pony Hatchery production ponds and raceways. 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.

PDFH were fed a Skretting trout diet ranging from #1 starter to 2.5 mm.

Harvest: Five ponds that were empty or mostly empty of fish and were drawn down on May 13th. A handful of fish were tossed into other ponds with good numbers. The main harvest and stocking happened June 2nd through the 4th. 184,768 PDFH were harvested. These fish averaged around 6" in total length. Most of the fish were distributed to our 4 stocking targets within the state of Missouri. 10,357 fish were distributed to two 1.5-acre ponds to be held over the summer at Blind Pony Hatchery. These fish were to be used for the state fair display, as well as monthly testing for Ranavirus in the hatchery system. On June 8th, we harvested 5 raceways of surplus PDFH (originally set as fry) for a total of 9,519 paddlefish averaging 5.17"-6.82" total length. These fish were taken to Lake of the Ozarks.

Total Harvest and Stocking:

- 194,287 fish harvested
 - 10,357 set in hatchery ponds #31 & #32 for summer/fall harvest
 - 50 set in hatchery pond #11 for growth study
 - 99,988 to Harry S. Truman Reservoir
 - 59,084 to Lake of the Ozarks
 - 24,358 to Table Rock Lake
 - 500 to the Black River (tagged)

Ranavirus Testing: Testing was performed monthly from May through June on all ponds to look for Ranavirus positives. 60 fish were removed each month, and samples were sent to the USFWS lab in Lacrosse WI. Testing was also performed over the summer on two ponds of PDFH retained for this purpose. All tests came back negative for Ranavirus throughout the year.

Growth Study: 50 PDFH were stocked into a 1-acre pond at the time of spring harvest (June 8th). The purpose was to study the growth of PDFH removed from a commercial diet and stocked into a natural low-density environment. These PDFH averaged 6.49" total length at the time of stocking. The pond was left alone throughout the summer. No fertilization or feed was given, nor was the pond aerated or aquatic vegetation treated. The pond was harvested on October 12th. 44 of the 50 fish were present,

averaging 24.5" in total length. These PDFH grew an average of 1" every 7 days throughout the summer despite being removed from a commercial diet. The study result was very similar to our 2020 study where PDFH attained a growth rate of 1" every 5 days (through August).

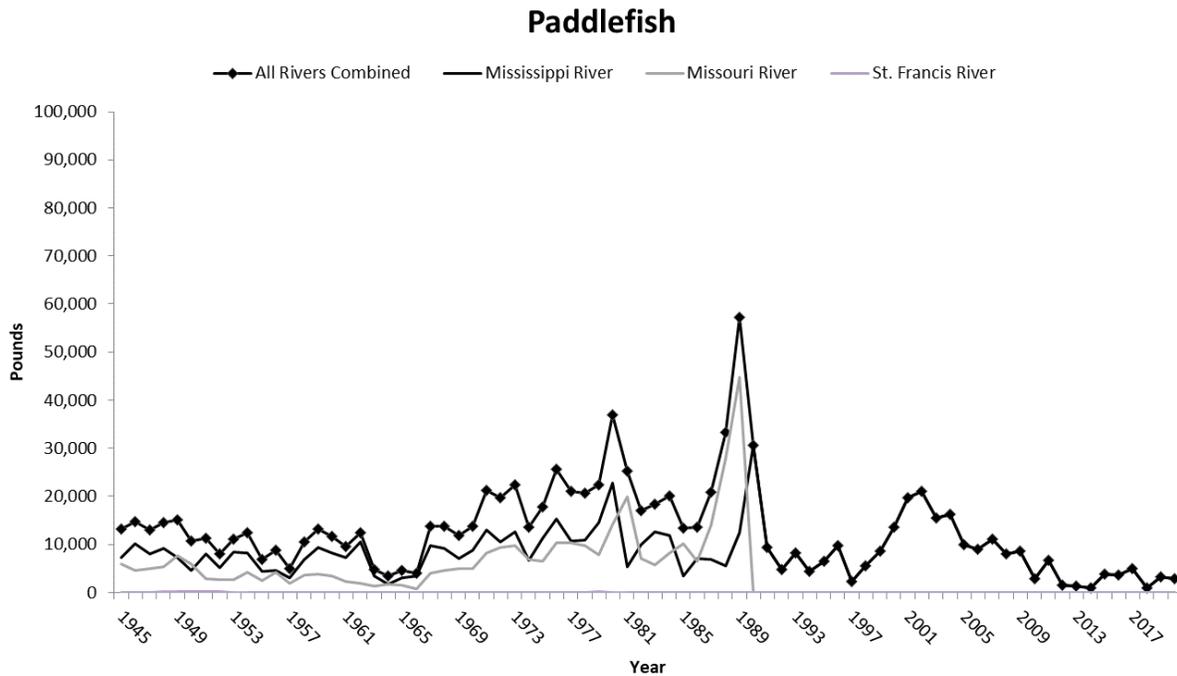
Literature Available: *Blind Pony State Fish Hatchery Report 2021*

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Commercial Fishing Program

Mississippi River PDFH harvest decreased from 3,305 lbs. in 2019 to 2,840 lbs. in 2020, consisted of 136 fish (average weight 20.9 lbs./fish), and produced 319.49 lbs. of roe. Harvest occurred throughout the Mississippi River but was highest on the lower river near the Arkansas border.



Pounds of paddlefish commercially harvested, by river and from all rivers combined: 1945-2018.

Literature Available: *Missouri Commercial Fish Harvest Report 2020*

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Montana- Mike Backes

- 1) Montana, North Dakota, and Dennis Scarnecchia finalized the third edition of a joint paddlefish management plan in 2021. Plan covers 2021-2030.
- 2) Three different recreational paddlefish fisheries (anglers limited to one season/year), no commercial harvest opportunities:
 - a. Fort Peck Stock
 - i. Estimated harvest 415 fish (5-year average 343 per year)
 - ii. Snag fishery (May 1 – June 15)
 - iii. Limited quota draw to issue 1,000 harvest tags
 - iv. Catch and release only tag also available
 - v. No caviar production
 - b. Fort Peck Dredge Cuts Stock
 - i. Estimated harvest 34 fish
 - ii. Archery only season (July-August)
 - iii. No caviar production
 - c. Sakakawea Stock – Yellowstone River and Missouri River between Fort Peck and Sakakawea Reservoirs
 - i. Estimate harvest in Montana is 777 fish (5-year average 871 per year)
 - ii. Snag fishery (May 15 – June 30)
 - iii. Average of 2,700 harvest tags sold over the counter per year
 - iv. Harvest cap 1,000 fish
 - v. Caviar produced as a byproduct of the recreational harvest. Anglers provided free fish cleaning service in exchange for donating caviar to a community grant program. A total of 1,360 pounds of finished caviar produced from this fishery in Montana.
- 3) Large Habitat Projects for Pallid Sturgeon recovery efforts
 - a. Intake Diversion Dam – construct a new concrete weir and new 1.9-mile-long fish passage channel around the dam. New dam completed in 2021, the bypass channel could be operational as soon as May 2022. Operation of the bypass channel depends on the construction schedule which could be as late as April 2023.
 - i. Associated fish research includes a pre- and post-four-year fish passage telemetry study at the diversion dam. Fish species evaluated include pallid sturgeon, shovelnose sturgeon, paddlefish, blue sucker and sauger. The pre-project study completed 2015-2018 included over 700 individual telemetered fish to establish base line fish passage data at the diversion dam. Translocation of telemetered pallid sturgeon upstream of the dam also incorporated within the study to evaluate potential habitat usage and spawning activity upstream of the dam. Fish manually tracked via boats and array of 17 base stations located on the Missouri, Yellowstone and Powder rivers. A four-year post-construction study will occur after the bypass channel is open.
 - ii. Standardized annual larval sampling program in the Yellowstone, Tongue, and Powder rivers initiated upstream of Intake dam in 2019 to document successful spawning of pallid sturgeon, shovelnose sturgeon, and paddlefish.

- b. Experimental Fort Peck Reservoir flow releases – authorized for 2022 but drought conditions dropped reservoir elevations beyond minimal requirements to conduct the experiment. Schedule depends on water conditions in future years. Population of telemetered pallid sturgeon and manual and base station arrays will be utilized to document fish response to experimental flow releases when conducted.

Nebraska- Kirk Steffensen

Adult Paddlefish Sampling

In 2021, the Nebraska Game and Parks Commission did not complete any standard adult Paddlefish sampling. Adult Paddlefish were last sampled during 2017 in the Gavins Point Dam tailwater. The last Paddlefish sampling summary is available in Steffensen (2020).

Steffensen, K. D. 2020. Missouri River ecology. Federal Aid in Sport Fish Restoration, F-75-R, Performance Report. Nebraska Game and Parks Commission, Lincoln, Nebraska.

Lewis and Clark Lake: Age-0 Paddlefish Trawling

In 2021, the Nebraska Game and Parks Commission did not complete the standard age-0 Paddlefish sampling. Paddlefish were last sampled during 2018 in Lewis and Clark Lake. The last general sampling summary is available in Steffensen (2020).

Steffensen, K. D. 2020. Missouri River ecology. Federal Aid in Sport Fish Restoration, F-75-R, Performance Report. Nebraska Game and Parks Commission, Lincoln, Nebraska.

Gavins Point Dam Archery and Snagging Paddlefish Seasons:

The Nebraska Game and Parks Commission and South Dakota Game, Fish and Parks jointly manage archery (June 1-30) and snag (October 1-31) Paddlefish seasons in the Missouri River below Gavins Point Dam. Each state issues 275 archery permits and 1600 snagging permits and includes a postcard survey with each permit.

For the archery season, we received a 47% response rate. We estimate that only 4.5% of anglers did not fish, which was the second lowest ever observed and much lower than the long-term mean (12.5%). Of the 95.5% of archery anglers that participated, only 18.3% did not harvest a Paddlefish, 21.6% harvested a below slot-sized fish, 49.1% harvested a slot-sized fish, and 6.5% harvested an above slot sized fish. The estimated harvest of 212 Paddlefish is considerably higher than the long-term average (N = 103). Archery anglers reported 1,161 hours of fish effort, which extrapolated to over 2,400 hours when accounting for the non-respondent survey cards. This year's efforts was the third lowest observed with the average angler spending 9.3 hours fishing during the 2021 archery Paddlefish season..

For the snagging season, we received a 48% response rate. We estimate that 6.7% of anglers did not fish, which was slightly less than the long-term average (10.9%). Of the 93.3% of snagging anglers that participated, 54.5% did not harvest a Paddlefish, 35.3% harvested a below slot-sized fish, and 2.9% harvested an above slot-sized fish. The overall harvest rate was estimated at 613 fish, which is the below long-term average (762 fish). In addition to the Paddlefish harvested, we estimate that 10,901

fish were released during the 2021 snagging season. To protect the breeding Paddlefish population, all fish between 35 – 45 inches must be released and the majority of fish released (N = 7,864, 72%) were in this protected slot. The average angler spent 14.0 hours fishing during the 2021 Paddlefish snagging season, which is about 3.5 hours per angler greater than the long-term average.

Commercial Harvest:

Neither Paddlefish nor sturgeon commercial harvest is allowed.

Sturgeon:

The Nebraska Game and Parks Commission continues to collaborate with the US Army Corps of Engineers, the US Fish and Wildlife Service, and other basin states on the Missouri River Recovery Program.

Pallid Sturgeon are an endangered fish in Nebraska. Populations of wild-origin fish appear stable with hatchery-origin fish comprising the majority of Pallid catches. Reproduction is very limited only being detected three years and in the lower Missouri River below the NE/KS border. Age-1 recruitment has not been documented but we annually new wild-origin sub-adult and adult sized fish.

Shovelnose Sturgeon are a sport fish in Nebraska with recreational harvest permitted. Overall, populations appear stable with some level annual reproduction.

Lake Sturgeon are listed as a threatened species in Nebraska with captures being rare. In 2021, we capture two fish.

Stocking:

No Paddlefish stocking occurred by NGPC. Pallid Sturgeon were the only sturgeon species stocked as part of the recovery efforts.

North Dakota- Paul Bailey

In May of 2022, The North Dakota Game and Fish Department (NDGF) collected 1,005 unique paddlefish (38.3% of which were previously jaw tagged) over a five-day sampling period in the Norwegian Bend Area (an approximately 12 mile reach where past sampling has indicated virtually all adult paddlefish that are attempting to spawn in any given year are concentrated within for a several week period) of the Missouri River between Garrison Dam and the headwaters of Lake Oahe. This large sample size allowed us to calculate one of our most precise multiple-pass mark-recapture population estimates on this paddlefish population to date (Figure 1). It is important to note that these were all sexually mature fish and, given spawning periodicity of male (typically 1-2 years) and female (typically 2-3 years) fish in this population, this estimate of population size in the Norwegian Bend Area likely represents approximately half of the total number of adult paddlefish between Garrison and Oahe Dams. There currently is not a harvest or catch-and-release angling season for this population but

anglers typically report 10+ incidentally snagged tagged paddlefish annually and we have had three mortalities of tagged fish reported during the summer of 2022 that were struck by boats. The NDGF has jaw tagged over 11,000 adult paddlefish in this population since tagging began in 2006.

Norwegian Bend Paddlefish Population Estimates

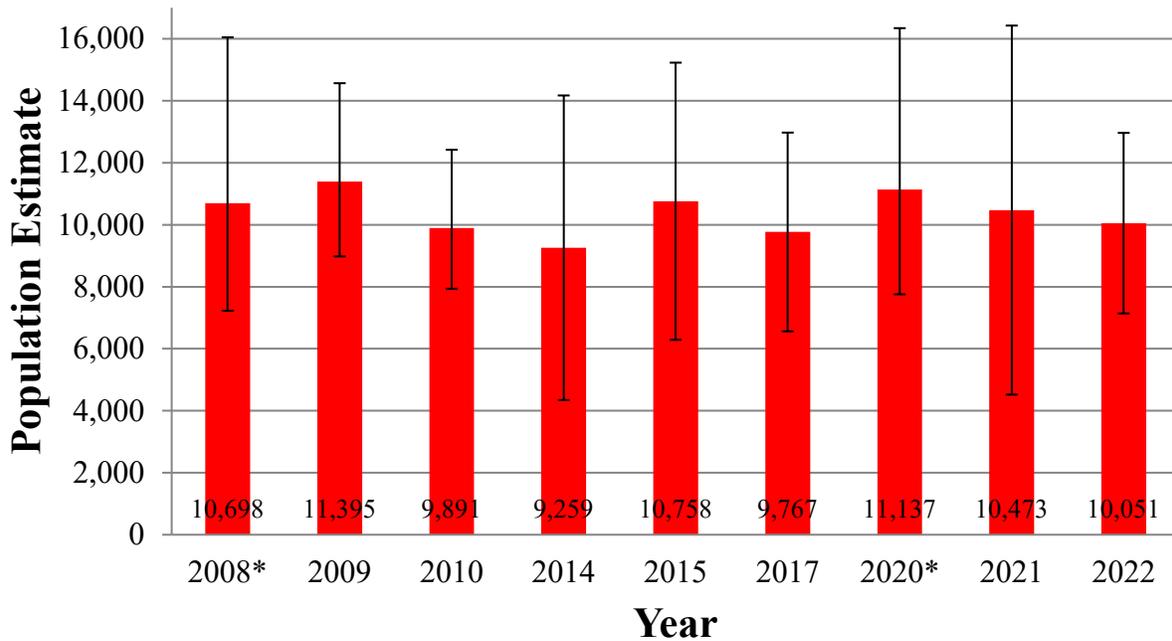


Figure 1. Norwegian Bend paddlefish population estimates. Error bars represent 95% confidence intervals. * indicate four-pass mark-recapture estimates, all other estimates were five-pass mark-recapture estimates.

North Dakota’s other paddlefish population is located above Garrison Dam and supports a recreational snagging season (both harvest and snag & release). This population is jointly managed by NDGF and Montana Fish, Wildlife, and Parks.

Much like the 2016 and 2017 North Dakota paddlefish seasons, the 2022 season was rather short with only 4 harvest days allowed before reaching the 1,000 fish harvest cap and announcing an in-season closure. The season started with low river flows which typically results in fast catch rates among snaggers and shorter seasons. Males dominated the harvest comprising 72% of the fish cleaned by North Star Caviar. While no Age data is available yet there appears to be more returns of males from the highly anticipated 2011-year class.

Wisconsin- Nate Nye, Bradd Simms, and Joseph Gerbyshak

Paddlefish: Paddlefish are listed as a state threatened species for Wisconsin. There is no commercial fishing or recreational fishing for paddlefish in Wisconsin. As such, there is no targeted survey effort directed to paddlefish. Nevertheless, there are paddlefish populations of note in the main stem of the

Mississippi River as well as major tributaries such as the Wisconsin and Chippewa rivers. Paddlefish captures during WDNR survey work are incidental, and data collection has been minimal. In 2021 the WDNR crew from Poynette began collecting paddlefish data from fish caught as bycatch during the fall gill netting survey targeting lake sturgeon in the tailrace of the Prairie du Sac Dam on the Wisconsin River (lowermost dam on the river, 92 miles upstream from the mouth). Paddlefish are regular bycatch in the 11 and 12-inch stretch mesh nets, but in past years they had been immediately released without collecting any data or marking the fish. In an effort to estimate the number inhabiting the tailrace, Poynette staff began marking paddlefish in the fall of 2021. Fish were marked with PIT tags at the base of the dorsal fin, with eye-fork length and weight recorded prior to release. In total, 74 paddlefish were sampled (72 marked with PIT tags) in 2021 with no recaptures yet. Eye-fork lengths ranged from 30.0-47.3 inches, and weights ranged from 18.0-64.0 pounds. Staff from Poynette plan to continue to collect data and mark paddlefish annually in the fall moving forward. ***Since these fish may migrate freely between the Wisconsin and the Mississippi, other agencies that encounter paddlefish in the system should be advised that there are fish carrying PIT tags. Please scan your paddlefish for the presence of a PIT tag if possible/practical, record that info, and contact Nathan Nye at Nathan.Nye@wisconsin.gov or (608) 635-5143 to report the fish. Again, the tagging location is at the base of the dorsal fin.***

Lake Sturgeon: Lake sturgeon are monitored extensively each year on a number of Mississippi River tributary systems including the Wisconsin River, the Chippewa River, the Black River, and the St. Croix River. Monitoring occurs in the spring, fall, or both, depending on the system. Routine population monitoring will continue as planned in 2022. If lake sturgeon are encountered during a survey, please check for the presence of a PIT tag located under the skull plate or second scute along with the presence of a floy tag at the base of the dorsal. Please report recaptures to Nate Nye or Joseph Gerbyshak at Joseph.Gerbyshak@wisconsin.gov or 715-461-0191.

Beyond routine monitoring, there are a couple of lake sturgeon projects of note. Joseph Gerbyshak, the WDNR fisheries biologist in Eau Claire, has been utilizing acoustic tags and the array of receivers in the lower Chippewa and Mississippi rivers to track movements of adult lake sturgeon tagged during spawning in the Chippewa River in spring 2021. Following the spawn, the fish dispersed downriver with the majority taking up residence in Lake Pepin (MR pool 4), and a few resident fish remaining in the Chippewa. This project is ongoing. For those who are interested, you can view the presentation Joseph gave at our recent Wisconsin AFS meeting here: <https://vimeo.com/669177256>

DNR fisheries biologists out of Black River and Baldwin, Zach Woiak and Kasey Yallaly, are in the initial stages of starting acoustic projects to monitor lake sturgeon movement in the Black River and St. Croix River.

The second project is about to commence. We will be looking at the genetic makeup of the lake sturgeon stocks in the major Wisconsin tributaries to the Mississippi to determine if they look like discrete spawning stocks, or members of a larger indiscrete Mississippi River mainstem population at large. Genetic samples will be collected from the Wisconsin, Chippewa, Black, St. Croix, and Yahara (Rock River tributary; Madison lakes remnant population) rivers, as well as hopefully MR pools 9/10/11.

Sample collection will occur as part of routine monitoring surveys this spring and fall. Results of this analysis are anticipated in early 2023.

Shovelnose Sturgeon: Monitoring of shovelnose sturgeon stocks has occurred in the past primarily through targeted electrofishing surveys on the Chippewa, St. Croix, Red Cedar, and Wisconsin rivers. Targeted survey effort is planned once again for 2022 on the lower Wisconsin River. No targeted surveys are planned for 2022 on the Chippewa, St. Croix, or Red Cedar rivers. However, shovelnose sturgeon will be collected as part of baseline monitoring during non-wadable river surveys.

Prairie du Sac Dam Tailwater Creel: Wisconsin Department of Natural Resources conducted a random stratified roving access creel on the lower Wisconsin River from the Prairie du Sac dam downstream to State Highway 12 encompassing 3 river miles and 300 acres. The creel started November 1, 2020 and ended October 31, 2021.

Paddlefish did not receive targeted effort. However, anglers did report an incidental catch of 98 Paddlefish in the scour hole below the Prairie du Sac dam. All were reported released.

Lake Sturgeon received 11.5% of angler effort totaling 7,648 hours and 25.5 hours/acre. Resident anglers made up 26.1% of the total effort targeting Lake Sturgeon. Non-resident anglers made up 73.9% of the total effort. All angler effort for Lake Sturgeon was during Wisconsin's Lake Sturgeon hook and line season which runs from the 1st Saturday in September through September 30th each year.

All anglers interviewed reported a total catch of 835 Lake Sturgeon with 15 harvested. Nine of the 15 were harvested illegally out of season by the same group of anglers. They mis-identified the juvenile Lake Sturgeon as Shovelnose Sturgeon. Most of the Lake Sturgeon caught below the Prairie du Sac dam are juveniles. Anglers targeting Lake Sturgeon reported a total catch of 245 with 6 harvested. The average catch rate by anglers targeting Lake Sturgeon was 0.13 per hour. Harvest rate was 0.003201 Lake Sturgeon per hour. One harvestable Lake Sturgeon was caught every 312.4 hours of angler effort. Adult Lake Sturgeon \geq 50 inches total length had a preseason population estimate of 163. Anglers registered 19 Lake Sturgeon for harvest during the September hook and line season for an exploitation rate of 11.7%. This was the highest harvest total and exploitation rate since the current 60-inch minimum length limit and one fish season bag limit went into effect in 2007. In most years since 2007, exploitation has been at or below 5%. High harvest in 2021 was due in part to excellent weather and river conditions (low water) for the entire hook and line season. These factors limit angler effort for a portion of the season in most years.

Shovelnose Sturgeon received 5.2% of angler effort totaling 3,481.6 hours and 11.5 hours/acre. Resident anglers made up 55.2% of the total effort targeting Shovelnose Sturgeon. Non-resident anglers made up 40.3% of the total effort with anglers of unknown residency making up the remaining 4.5%.

All anglers interviewed reported a total catch of 274 Shovelnose Sturgeon with 110 harvested. Percent of catch harvested was 40.1. Anglers targeting Shovelnose Sturgeon reported catching 134 with 95 harvested. Percent of catch harvested was 70.9%. Total length of harvested Shovelnose Sturgeon reported by anglers ranged from 24 to 31 inches with a mean length of 26.3 inches. Catch and release

and unacceptable size were two reasons given by Shovelnose Sturgeon anglers for fish not harvested. Both reasons received 50% of the response. The average catch rate by anglers targeting Shovelnose Sturgeon was 0.16 fish per hour. Shovelnose Sturgeon are open year-round on the lower Wisconsin River with a daily bag limit of 3 and no size limit.