Briefing Book

Executive Board Meeting

January 30-31, 2024

Tennessee Aquarium Conservation Institute
175 Baylor School Rd
Chattanooga, TN 37405

TABLE OF CONTENTS

Supporting Documents

Executive Board Meeting

January 30-31, 2024

Tennessee Aquarium Conservation Institute
175 Baylor School Rd
Chattanooga, TN 37405

Remote Participation
Join Zoom Meeting
Meeting ID: 834 4528 1633
Passcode: 332465
Phone: 312-626-6799

AGENDA

(All times are Eastern)

Tuesday, January 30, 8:30-5:00, Classroom

Call to Order / Welcome

1) Roll Call and Determination of Quorum (Brad Parsons)

2) Welcome to Tennessee Aquarium Conservation Institute (Bernie Kuhajda)

Approval of Agenda and Prior Meeting Minutes

3) Approval of February 2023 Executive Board Meeting Minutes (Parsons)

4) Approval of August 2023 Executive Board Meeting Minutes (Parsons)

5) Review of Action Items

Chairman and Coordinator Reports

6) Chairman's Report (Parsons)

7) Coordinator's Report (Conover)

Sub-basin Updates

8) Arkansas-Red-White Rivers (Ken Cunningham)

9) Lower Mississippi River (Vacant)

10) Missouri River (Kasey Whiteman)

11) Ohio River (Rich Zweifel)

12) Tennessee-Cumberland Rivers (Dave Dreves)

13) Upper Mississippi River (Kirk Hansen)

Federal Entity Updates

14) Federal entity updates

Policy Coordinator Update

15) Legislative, Policy, and Outreach Next Steps (Smith)

16) 2024 DC Fly-in preparation (Smith)

Afternoon Break

Committee Updates

17) Invasive Carp Advisory Committee (Rob Simmonds and Brian Schoenung)

18) Sub-basin Invasive Partnership Coordinators (Caleb Aldridge, Neal Jackson, and Rebecca Neeley)

Partner Updates

19) Wildlife Forever (Pat Conzemius)

Wednesday, January 31, 8:30-5:00, Classroom

Site Visit

20) Tour of Tennessee Aquarium Conservation Institute (Kuhajda)

Committee Updates

21) Paddlefish Sturgeon Committee (Sara Tripp)

22) Mississippi River Basin Panel on AIS (Rob Bourgeois)

23) Aquatic Invasive Species Committee (Rob Bourgeois)

Lunch

Old Business

24) Webpage Dashboard Demonstration (Rebecca Neeley and Ross Ruehmann)

25) Mississippi River Basin Fishery Commission Next Steps (Parsons)

26) USFWS Economic Value Report Update (Conover)

27) MICRA's 2024-2028 Priorities Document (Conover)

28) MICRA's Aquatic Habitat Action Plan (Conover)

Afternoon Break

Nominations and Installation of New Officers and Executive Board Members

29) Passing of the Gavel: Installation of MICRA Chairperson 2024-2025 (Parsons)

30) Nomination for MICRA Chair-elect 2024-2025 (Batten)

31) Nomination for Lower Mississippi River Sub-basin Representative (Batten)

New Business

32) 2024 Workplan Development (Batten)

33) Young Professionals Travel Stipend (Conover)

34) Interjurisdictional Fisheries Symposium Discussion (Batten)

35) Schedule Spring Conference Call and Summer Executive Board Meeting (Batten)

36) Other New Business / Parking Lot (Batten)

Adjourn

1) Roll Call and Determination of Quorum

MICRA Executive Board Members

Voting Members

Arkansas-Red-White Rivers	Ken Cunningham	ODWC
Lower Mississippi River	Vacant	
Missouri River	Kasey Whiteman	MDC
Ohio River	Rich Zweifel	OH DNR
Tennessee-Cumberland Rivers	Dave Dreves	KDFWR
Upper Mississippi River	Kirk Hansen	IA DNR
USFWS	Aaron Woldt	USFWS
USGS	JC Nelson	USGS
MICRA Chairperson-Elect	Ben Batten	AGFC

* Six voting members are needed for a quorum.

Non-voting members

MICRA Chairperson	Brad Parsons	MN DNR
MICRA Past Chairman	Brian Schoenung	IL DNR
MICRA Coordinator	Greg Conover	USFWS

Committee Chairpersons

AIS Committee	Rob Bourgeois	LDFW
Invasive Carp Advisory Committee	Rob Simmonds	USFWS
MRBP - MICRA Liaison	Rob Bourgeois	LDFW
Paddlefish/Sturgeon Committee	Sara Tripp	IL DNR

Introductions

2) Welcome to Tennessee Aquarium Conservation Institute

Information:

Bernie Kuhajda will welcome the Executive Board and provide an overview of the Tennessee Aquarium Conservation Institute.

3) Approval of February 2023 Executive Board Meeting Minutes

Decision:

Executive Board members will be asked to approve both the February 2023 Executive Board Meeting Minutes and Notes as final. Meeting minutes are provided in Appendix 1 and will be posted on the MICRA website once approved as final. Meeting notes can be accessed here: http://micrarivers.org/executive-board-february-2023-meeting/. No comments have been received on the minutes or notes. Do board members need additional time to review either document before approving as final?

4) Approval of August 2023 Executive Board Meeting Minutes

Decision:

Executive Board members will be asked to approve both the August 2023 Executive Board Meeting Minutes and Notes as final. Meeting minutes are provided in Appendix 2 and will be posted on the MICRA website once approved as final. Meeting notes cab be accessed here: http://micrarivers.org/executive-board-august-2023-meeting/. No comments have been received on the minutes or notes. Do board members need additional time to review either document before approving as final?

Executive Board members will also be asked to approve both the August 2023 MICRA Delegate Meeting Minutes and Notes as final. Meeting minutes are provided in Appendix 3 and will be posted on the MICRA website once approved as final. Meeting notes cab be accessed here: http://micrarivers.org/executive-board-august-2023-meeting/. No comments have been received on the minutes or notes. Do board members need additional time to review either document before approving as final?

5) Review of Action Items

Discussion:

Executive Board members will review Decisions and the status of Action Items from the board's August 2023 meeting and discuss completion of outstanding action items. Outstanding Action Items from previous meetings are also included for consideration. Status of each action item is noted in green font if complete and red font if not completed.

August 2023

Decisions

* A quorum of voting members was not present throughout the meeting. When necessary, decisions were approved by the Executive Board via email following the meeting.

1. MICRA will target National Invasive Species Awareness Week (NISAW) February 26 – March 1, 2024, for a DC Fly-in event.
2. The Executive Board agreed to target November 8, 2023, for Congressional briefings in Washington, DC.
3. The Executive Board agreed to provide the Aquatic Habitat Action Plan to the delegates once finalized rather than requesting another review of the document.
4. The Executive Board agreed to use 6th order and larger streams for the MICRA list of interjurisdictional rivers in the basin.
5. The Executive Board agreed to continue moving forward with a proposed increase in state member annual membership dues from $1,500 to $3,000 beginning in 2024.
6. The Executive Board agreed that rivers on federal lands, with federal authorities (e.g., navigable streams, National Wild and Scenic Rivers), and those within the Ceded Territories should be included MICRA's list of interjurisdictional rivers.
7. The Executive Board agreed to remove reservoirs from the list of interjurisdictional rivers for consistency across the sub-basins. A general statement about reservoirs could be added.
8. Executive Board members agreed to a 2-week review period of the draft meeting notes for the February 2023 Executive Board meeting once they are provided by Conover.
9. Conover will provide a final list of February 2023 decisions and action items to the Executive Board members along with the final draft meeting notes for the February 2023 meeting.
10. The Executive Board approved a draft letter from the Paddlefish Sturgeon Committee in support of the North American Sturgeon and Paddlefish Society's petition to establish October 27th as National Sturgeon Day.
11. The Executive Board agreed to seek nominations for the MICRA Chair-elect on a "loose" rotation among the following sub-basins: ARW&LMR, MOR, OHR&TNCR, and UMR.

12. The Executive Board tentatively scheduled a virtual meeting from 9am-11am Central on Friday, October 27th.
13. The Executive Board tentatively scheduled an in-person meeting January 29-30, 2024, in Chattanooga, Tennessee, prior to the Southern Division AFS meeting.

Action Items

1. JC Nelson will introduce MICRA to the Mississippi River Cities and Towns Initiative Executive Director, Colin Wellenkamp.

   Complete

2. Ashlee Smith will attempt to find Congressional sponsors and confirm rooms for Congressional briefings (one Senate and one House) on November 8, 2023.

   Complete

3. Ashlee Smith will provide a save-the-date email for Congressional briefing in Washington, DC, on November 8, 2023, to Conover for distribution to the MICRA member agencies and USACE.

   Complete

4. Executive Board members will work to identify a representative from each sub-basin to participate in the proposed Congressional briefings in Washington, DC, on November 8, 2023.

   Complete

5. Ashlee Smith will send a request for pictures to be used on social media and a Mississippi River Basin Fishery Commission coalition to Conover for distribution to the MICRA Delegates and sub-basin invasive carp partnerships.

   Complete / Standing need

6. The Executive Board will attempt to recruit participation from more delegates for short 1- or 2-day visits during the 2024 DC Fly-in.

   On-going: A list of key target offices is needed from Smith.

7. Ashlee Smith will request MICRA Delegates 1) to continue to speak with their agency director regarding the Mississippi River Fishery Commission and associated draft legislation, and 2) to notify her of opportunities to get Congressional staff out to observe field work and talk with delegates.

   Complete / Standing need?

8. Bourgeois will work with the AIS Committee members to provide any additional AIS priorities for the draft 2024-2028 Priorities document to the Executive Board by November 1.

Complete

9. Conover will provide a revised draft 2024-2028 Priorities document to the Executive Board in early November.

   Complete

10. The Executive Board will review the revised draft 2024-2028 Priorities document and provide it to the MICRA Delegates for a final review by November 30 if there are substantial changes.

    Complete: An additional review by the delegates was not needed.

11. The Executive Board will finalize the draft 2024-2028 Priorities document and post it on the MICRA website in December.

    On-going: A final review of the 2024-2028 Priorities document is scheduled for the January 2024 meeting and will be posted on the website following the meeting.

12. Conover will include a discussion of next steps for aquatic habitat on the agenda for the board's next meeting.

    Complete On the agenda for the board's January 2024 meeting.

13. Conover will include a discussion about an interjurisdictional fisheries symposium on the agenda for the board's next meeting, including a list of upcoming meeting dates and locations (e.g., AFS, Midwest, etc.).

    Complete: On the agenda for the board's January 2024 meeting.

14. The Executive Board will develop a justification for a proposed increase in state agency annual membership dues from $1,500 to $3,000 t0 explain why the additional funding is needed, how it will be used, and the benefit it will provide back to the member agencies.

    Complete

15. Conover will work with Parsons and Batten to send a follow up email to the MICRA Delegates to let them know the board's decision to propose a By-laws amendment to increase the state agency member annual dues to $3,000 beginning in 2024.

    Complete

16. Batten and Smith will work with the sub-basin representatives to schedule sub-basin or 1-on-1 calls with MICRA delegates to discuss the fishery commission and draft legislation.

    Unknown

17. Neal Jackson will share the TNCR Phase 1 decision analysis results with the MICRA Executive Board once the process is complete and the results have been provided to USACE.

    On-going: An update will be provided during the board's January 2024 meeting.

18. Smith will organize a call with the state members of the Executive Board within the next 2-weeks to continue discussing MICRA's 2024 WRDA priorities.

    Complete

19. Conover will send Smith the additional coalition prospects that were identified by the Executive Board members during their August 2022 meeting.

    Complete

20. Conover will work with Angela Erves to see if additional information on federal authorities, federal lands, and Ceded Territory can be added to the sub-basin tables of interjurisdictional rivers in the Mississippi River Basin.

    Complete: An update will be provided during the board's January 2024 meeting.

21. Conover will follow-up with the respective sub-basin representatives to discuss sub-basin specific questions on the draft lists of 6th order and larger rivers.

    On-going

22. Conover will update the draft 2024-2028 Priorities document based on the board's review and discussion of the comments discussed during their August 2023 meeting.

    Complete

23. Conover will update the 2019-2023 Priorities Accomplishment tracking at the end of the year and provide it to the Executive Board members for review.

    Complete: A review of the updated 2019-2023 Priorities Accomplishment tracking is on the agenda for the board's January 2024 meeting.

24. The Executive Board will finalize the draft 2019-2023 Priorities accomplishment tracking after Conover provides a final draft at the end of the year.

    On-going: A review of the updated 2019-2023 Priorities Accomplishment tracking is on the agenda for the board's January 2024 meeting.

25. Conover will provide the draft February 2023 Executive Board meeting notes for review prior to the October 27th meeting.

    Complete: Provided prior to the board's January 2024 meeting.

26. The Executive Board will consider approval of the February 2023 Executive Board draft meeting notes during the October 27th meeting.

On-going: Approval of the February 2023 Executive Board draft meeting minutes and notes are on the agenda for the board's January 2024 meeting.

27. Executive Board members will review the Decisions and Action Items provided in the August 2023 meeting briefing book and provide updates to Conover as they are addressed.

    Complete: No updates provided…

28. JC Nelson will provide Conover with the soon to be released USGS research priorities for paddlefish and sturgeon for dissemination and review by the Paddlefish Sturgeon Committee members.

    On-going: Nelson checked on the status of the draft document and it is not available for review by the Paddlefish Sturgeon Committee yet.

29. The Executive Board will consider the information provided by the ICAC regarding the potential allocation of USFWS FY23 "plus-up" funding in FY24 and determine if any recommendation will be provided by MICRA to USFWS.

    Complete

30. Conover will follow-up with the sub-basin invasive carp partnership coordinators to determine if sub-basin fact sheets can be provided prior to the Congressional briefing tentatively planned for November 8, 2023.

    Incomplete: Sub-basin invasive carp partnership fact sheets have not been developed. This remains an unmet need.

31. Parsons and Smith will update the contractual agreement between MICRA and Ellis Smith Policy Solutions to reflect the 9-month extension that was approved by the Executive Board June 30, 2024.

    Complete

32. Conover will make proposed updates to the MICRA By-laws and share with the MICRA Executive Board members for discussion during the October 27th meeting.

    Complete

33. Rebecca Neeley will determine the possibility of the La Crosse FWCO developing a web-based dashboard tool for MICRA that includes MICRA sub-basin group boundaries, congressional districts, MICRA's 6th order and larger streams, and the characterization of relative abundance of bigheaded carps similar to the figure included in the USFWS-led Report to Congress.

On-going: The Executive Board has not finalized MICRA's revised list of 6th order and large streams to provide to Neeley. An update on the web-based dashboard is on the agenda for the board's January 2024 meeting.

34. The Executive Board will consider what a few top priority communications needs or maps might look like and the data layers that would be needed to develop them.

    On-going: An update and discussion on the web-based dashboard is on the agenda for the board's January 2024 meeting.

35. Kasey Whiteman will seek a nomination for the MICRA Chair-elect 2024-2025 term from the Missouri River sub-basin delegates.

    On-going: Whiteman has requested a nomination for the MICRA Chair-elect from the Missouri River sub-basin delegates, but no nomination has been received. A discussion about the MICRA Chair-elect is on the agenda for the board's January 2024 meeting.

36. The Executive Board will vote electronically to approve an additional $5,000 travel budget for Ashlee Smith for the remainder of 2023.

    Complete: Approved

37. The Executive Board will vote electronically to approve the proposed 2024 operational budget with the addition of $1,000 to support ICAC and sub-basin invasive carp partnership meeting expenses.

    Complete: Approved

October 2023 Conference Call

Decisions and Action Items

1. Parsons and Whiteman will both send an email to the Missouri River sub-basin fish chiefs requesting a nomination for MICRA chair-elect.

   Complete

2. Conover was asked to share the draft legislation with all Executive Board members.

   Complete: Parsons sent to delegates.

3. Parsons will forward the draft legislation to all MICRA delegates from the MICRA email account.

   Complete

4. Sub-basin representatives were asked to provide two or three high level talking points on each topic for their respective sub-basin. What are key interjurisdictional actions, issues, or needs to highlight?

   Complete (or too late)

5. Conover will share the letter sent to MICRA from General Peeples, President Mississippi River Commission, with the board members.

   Complete

6. Parsons and Batten will participate on the call to be scheduled with General Peeples.

   On-going: Call scheduled for February

7. Executive Board members will attend the meeting with General Peeples if they are available. Conover will share the meeting information with the Executive Board members once it is scheduled.

   On-going: Calendar invite will be shared once received from USACE

8. Conover will propose early or mid-December to General Peeples' Executive Assistant as an initial window for scheduling a meeting.

   Complete

9. A notice and justification for the 2024 membership dues increase should be provided to the delegates as soon as possible.

   Complete

10. The notice and justification for the 2024 membership dues increase should also be provided with the 2024 membership dues invoices.

    Not started: Dues invoices will be provided once the Delegates vote on the amended Constitution and By-Laws is complete in February.

11. The board members agreed that any additional priorities or revisions to the draft 2024-2028 priorities document will need to be provided to the Executive Board by November 30th to allow time for the document to be finalized and shared with the MICRA delegates before the end of the year.

    Complete: An additional review by the delegates was not needed.

12. Based on SDAFS conference website (https://units.fisheries.org/tn/sdafs2024chattanooga/), the board members agreed to plan for Monday as a travel day with board meeting on Tuesday and Wednesday (1/29-1/31).

    Decision item.

13. Conover will contact conference hotel to see if he can get a group rate for Sunday-Tuesday nights. SDAFS conference rates start on Wednesday.

    Complete

February 2023 Meeting

Blue bullets are additions to the draft list of Decisions and Action Items provided in the August 2023 Briefing Book.

Decisions

1. The Executive Board requested detailed notes following Executive Board meetings for their reference and a meeting summary to be uploaded to the MICRA website rather than the detailed meeting notes.
2. The Executive Board approved a nomination for Duane Chapman to receive the MICRA River Champion Award.
3. The Executive Board approved the MRBP's request for the MICRA AIS Committee chair to also serve in the MRBP's newly created MICRA Liaison position.
4. The Executive Board will consider development of a "storyboard" for an interactive map housed on the MICRA website as a next step after the revision of MICRA's list of interjurisdictional rivers has been finalized.
5. The Executive Board approved the revised August 2022 Executive Board meeting notes as final.
6. The Executive Board, sub-basin invasive carp partnership coordinators, and ICAC will all continue to consider and discuss basinwide invasive carp communications needs.
7. The board agreed to provide written member updates for the Winter Executive Board meetings and verbal updates on news or issues from the delegates for the board's summer meetings.
8. The Executive Board decided to table the discussion about the MICRA Communications Plan.
9. The Executive Board will plan for an All-Delegate meeting in conjunction with the AFS annual meeting in Grand Rapids, Michigan, in August 2023.
10. The Executive Board will consider requests for speaker travel support to participate in the MICRA-sponsored Large Rivers Aquatic Habitat Restoration symposium during the August 2023 AFS annual meeting on an as needed basis.

11. The Executive Board approved posting the 2022 Invasive Carp Monitoring and Response Plan on the MICRA website and sharing the document with the Invasive Carp Advisory Committee.
12. The Executive Board decided to award the Young Professionals Travel Stipend to Patrick Padilla with the USFWS's Carterville Fish and Wildlife Conservation Office to present his thesis research into determining dam passage and inter-river movements of Black Carp via otolith microchemistry at the 2023 AFS annual meeting.
13. The Executive Board will plan to meet in conjunction with the AFS annual meeting in Grand Rapids, MI. Travel days will be Sunday, August 20th and Thursday, August 24th.
14. The Executive Board agreed to notify the delegates in the 2023 membership dues notices that they will be requesting the delegates to consider an increase in membership dues for the states to $3,000 beginning in 2024.

Action Items

1. Gaikowski will contact USACE Rock Island District to determine if a letter of support from MICRA can still be included with the USACE's Upper Mississippi River Restoration Program 2022 Report to Congress, and if so, who the letter should be submitted to.

   Complete: Letter submitted
2. Conover will work with Parsons to submit the UMRR letter of support pending the response from USACE Rock Island District.

   Complete: Letter submitted
3. Bourgeois was requested to have the recently updated summary of state regulations for invasive carp posted on the MRBP's website.

   Complete: posted on MRBP website
4. Conover will invite Duane Chapman to attend the MICRA Executive Board's Summer meeting to receive the MICRA River Champion Award.

   Complete:
5. Conover will review the MICRA By-laws and research Robert's Rules of Order to determine if the MICRA Chair-elect is, or should be, a voting board member.

   Complete: Discussed during the August 2023 meeting.

6. Conover will notify the ANS Task Force Executive Secretary that Rob Bourgeois will now serve as MICRA's primary representative to the ANS Task Force and the MICRA Chair will serve as the alternate voting representative.

   Complete:

7. Hupfeld will send the paddlefish commercial workgroup report to the Paddlefish Sturgeon Committee membership along with a note that the committee is now working to develop a basinwide paddlefish management framework, including an invitation for participation.

   Complete:

8. Parsons will send the paddlefish commercial workgroup report to the MICRA delegates along with a note that the committee is now working to develop a basinwide paddlefish management framework.

   Complete?

9. Conover will contact Stephen McMurray to let him know that MICRA can provide up to $1,000 in financial assistance to support the FMCS Biennial Symposium.

   Complete:

10. Conover will contact Stephen McMurray regarding potential native mussel priorities for the next MICRA priorities document.

    Complete (or too late)

11. Angela Erves will provide the Executive Board members with lists of 4th and 5th order and larger interjurisdictional rivers for each sub-basin by the end of February.

    Complete:

12. Executive Board members will review the lists of interjurisdictional rivers provided by Angela Erves and provide a response within 2 weeks.

    Complete:

13. Conover will create meeting minutes from the August 2022 Executive Board meeting notes that include the meeting agenda, participants, and decisions and action items to be uploaded to the MICRA website.

    Complete:

14. Rob Simmonds will send an updated list of ICAC and technical workgroup representatives to Conover; Conover will send to the sub-basin representatives; and the sub-basin representatives will send to their respective sub-basin delegates for their information.

Complete

15. Conover will follow-up with Smith to determine what invasive carp maps she is interested in and for what purpose so that he can help her directly or coordinate as needed.

    Complete:

16. Thurman will send an electronic version of the TWRA invasive carp fact sheet to Conover, and he will share it with the board members and invasive carp sub-basin partnership coordinators.

    Complete:

17. Bourgeois will share the TWRA video from the Congressional field visit at Pickwick Dam in August 2021, along with the appropriate context, at the next AIS Committee meeting.

    Complete:

18. Conover was requested to include a reminder about member updates (written or verbal) with Executive Board meeting announcements.

    Complete: / Standing

19. Whiteman will share information on Missouri's 2015-2017 study on flatheads and blues in the Missouri and Mississippi rivers with Zweifel.

    Unknown

20. Neal Jackson will put Dave Smith in touch with USFWS staff regarding telemetry data for invasive carp passage at Ohio River dams.

    Unknown

21. The ICAC was asked to provide the Executive Board with a list of questions to survey the basin states regarding limitations, challenges, and needs for increasing staff capacity to collaboratively work on invasive carp and how MICRA can potentially assist address these needs.

    Incomplete: Hope to come out of ICAC meeting with questions.

22. The ICAC was asked to develop a list of survey questions to gather baseline information from the basin states on current invasive carp removal efforts and potentially other needs to support the workgroups with the basinwide population assessment.

    On-going: Control Actions Workgroup recently formed and will address this action item at their next meeting.

23. The Executive Board will survey the delegates (questions to be developed by the ICAC) regarding staffing or hiring challenges to increase capacity for invasive carp work, as well as asking separate questions regarding the likelihood that the states would use fishery commission funding to hire additional staff to work on collaborative interjurisdictional fisheries management through the commission.

    Partially complete: Executive Board surveyed the delegates during the August All Delegate meeting regarding the likelihood that the states would use fishery commission funding to hire additional staff to work on collaborative interjurisdictional fisheries management through the commission. The ICAC has not developed and provided the Executive Board with a list of questions regarding staffing or hiring challenges to increase capacity for invasive carp work.

24. The Executive Board will survey the delegates (questions to be developed by the ICAC) regarding current invasive carp removal efforts.

    Incomplete:

25. Conover will add updates from the sub-basin invasive carp partnerships and the ICAC co-chairs to the agenda for the Executive Board's summer meeting to continue the dialogue between these groups.

    Complete

26. The MICRA Executive Board will continue to discuss Fishery Commission and Coalition next steps, including the topics to revisit identified during the February 2023 discussion.

    Complete

27. Smith will schedule a virtual meeting for the Fishery Commission coalition in the next couple weeks.

    Unknown: Delete

28. Smith will work with Gaikowski and Rodgers to put together a strategy for organizing Congressional field tours and site visits on the Mississippi River.

    Complete

29. Smith will work with Gaikowski and Neeley to plan a Congressional field visit at Lock and Dam 19 the week of May 15th, 2023.

    Complete

30. Smith will work with the partner organizations to identify target dates for an informational Congressional briefing and reception and then follow-up with the Executive Board.

Complete

31. Conover was asked to send periodic reminders to the MICRA Delegates requesting them to provide Ashlee Smith with opportunities in their states to get Congressional staffers out on the water.

    Complete / Standing – create a calendar reminder?

32. Conover will send a calendar invite and the MICRA Fishery Commission talking points to the MICRA delegates for both February 14th and 16th at 9:00 am Central for a 1-hour briefing on MICRA's fishery commission outreach effort and upcoming DC fly-in. Delegates will be asked to attend one of the two Zoom meetings.

    Complete

33. Executive Board members will review the draft accomplishment tracking for the 2019-2023 Priorities document and provide suggested additions or changes to Conover.

    Complete

34. Whiteman will develop a few bullets on the status and needs of habitat restoration related to the authorization for the construction of 166,000 acres of habitat in the Missouri River as mitigation for the Bank Stabilization and Navigation Project.

    Complete

35. Conover will provide the Executive Board with a draft 2024-2028 Priorities document by the end of March.

    Complete

36. The Executive Board will meet in mid-April, approximately 2 weeks after receiving the draft 2024-2028 Priorities document, to discuss the draft and moving it forward to the delegates.

    Complete

37. Parsons and Conover will schedule two All Delegate Zoom meetings to review MICRA's 2024-2028 Priorities document and request the delegates' input.

    Complete

38. Conover will incorporate the Delegates comments and a revised draft 2024-2028 Priorities document will be provided to the Delegates for their review prior to the proposed All Delegate meeting in August.

    Complete

39. Smith will provide Kim Lutz, AWI, with an updated version of MICRA's talking points for the 2023 DC fly-in.

    Complete (or too late)

40. Executive Board members were requested to provide contact information to Rude and Janvrin within the next two weeks for a sub-basin volunteer to assist on a committee to plan the Large Rivers Aquatic Habitat Restoration symposium during the August 2023 AFS annual meeting.

    Complete (or too late)

41. Conover will work with Neil Rude and Jeff Janvrin to identify opportunities and costs for a networking social following the MICRA-sponsored Large Rivers Aquatic Habitat Restoration symposium during the August 2023 AFS annual meeting.

    Complete

42. Executive Board members were asked to provide Conover and Parsons with suggestions on the MICRA presentation for the USGS Science Forum and information that MICRA could provide to USGS in the pre- or post-forum surveys.

    Complete

43. Conover will notify Patrick Padilla that the MICRA Executive Board has awarded him the Young Professionals Travel Stipend to present his thesis research into determining dam passage and inter-river movements of Black Carp via otolith microchemistry at the 2023 AFS annual meeting.

    Complete: Padilla did not request travel assistance

44. Parsons will include a note to the MICRA delegates with the 2023 membership dues notices that the Executive Board will be requesting the delegates to consider an increase in membership dues for the states to $3,000 beginning in 2024.

    Complete

45. Smith will contact Pat Conzemius with Wildlife Forever to discuss MICRA's initiative for the authorization of a Mississippi River Basin Fishery Commission.

    Complete

46. Parsons will contact Pat Conzemius via the MICRA email account and request the dates that he will be in St. Louis and Kentucky to initiate a line of communication between Wildlife Forever and MICRA.

    Complete (Conover discussed with Conzemius)

47. The MICRA Executive Board and invasive carp committees will consider ways to engage with NGO's (e.g., Wildlife Forever) so they are more informed and aware of the collaborative inter-agency efforts to manage and control invasive carp throughout the basin.

    On-going: On agenda to be discussed during the January 2024 meeting.

Outstanding Action Items

August 2022

9. The sub-basin partnership coordinators and ICAC co-chairs will provide examples of communications needs and barriers to the Executive Board.

    Not started:

12. The sub-basin partnership coordinators will work with their respective sub-basin partnerships to identify sub-basin scale objectives to assist the ICAC and MICRA Executive Board with basinwide planning and communications.

    On-going:

13. The sub-basin partnership coordinators and the ICAC co-chairs will continue to discuss how the sub-basin scale objectives should be consistently developed and will report back to the Executive Board when they have reached consensus.

    On-going: ICAC approach to objectives is to push for each sub-basin to develop specific objectives that can focus efforts, as directed by MICRA, but we haven't been and didn't plan to push for them to be "consistently developed" in terms of the method each uses to develop objectives. A diversity of approaches has been applied to date, which Coordinators will share. Suggest we continue down the path we're on and close out this Action Item knowing that objectives are being developed and tracked via the previous Action Items.

16. Sub-basin partnership coordinators will share the FishTracks factsheet with their partners once it is updated and provided by USGS.

    Unknown

17. Sub-basin partnership coordinators will discuss the Executive Boards interest in basinwide platforms for data management and analysis with the sub-basin partnerships.

    Unknown

18. Sub-basin partnership coordinators will work with USGS to schedule a webinar on FishTracks for the sub-basin partnerships.

    Incomplete

19. Sub-basin partnership coordinators follow-up with their partners to determine interest and concerns in a basinwide approach to collecting and storing telemetry data.

    Unknown

33. Conover will follow-up with Stephen McMurray about the Freshwater Mollusk Conservation Society referring to MICRA in their guidance documents and providing an annual update to the Executive Board.

    On-going: Need to follow-up with new FMCS Chair.

34. Conover will follow-up with Stephen McMurray to discuss incorporating Freshwater Mollusk Conservation Society priorities into the next MICRA priorities document.

    On-going: Need to follow-up with new FMCS Chair.

February 2022

14. Conover will work with Janvrin to finalize the draft action plan once the Executive Board approves a new MICRA list of interjurisdictional rivers in the Mississippi River Basin.

    On-going

August 2021

37. Conover will reach out to Bruce Reid to inform him about the Executive Board's interest in improving the MICRAs website and gage his interest in discussing the website with the MICRA Executive Board.

    Incomplete: Website action items not addressed yet.

6) Chairman's Report

Information:

Brad Parsons will provide an update on the Chairman's activities since the board's August 2023 meeting.

7) Coordinator's Report

Financial

- Accountant, bank, and coordinator financial records all reconcile as of 12/31/2023
    - 12/31/2023 balance = $225,673.55
        - MRBP balance = $42,145.74
        - MICRA balance = $183,527.81
    - MICRA has received notice that the accountant's monthly fee will increase from $265 to $300/month in April 2024.
        - This will put this expenditure $315 over budget that was approved in August. No action is needed.
        - Last increase in monthly fees was December 2014.
- Status of 2023 membership dues (see table below)
    - All states except Wyoming paid membership dues in 2023
    - MDC provided $10,000 additional dues for policy coordination.
    - Minnesota DNR provided $5,000 additional for policy coordination.
- MRBP funding
    - FY24 FWS funding
        - No federal budget so no NOFO yet.
        - Funding level expected to remain at $50,000.
        - MICRA projected to receive $4,500 for indirect cost.
    - MICRA's System of Award Management (SAM) registration expired January 19
        - SAM implemented more stringent entity validation measures over the last year and will no longer validate as "Association".
        - SAM created a new entity registration for MICRA as "Agreement" because MICRA's Tax ID Letter and Bank Account are in the name 'Mississippi Interstate Cooperative Resource Agreement'.
        - MICRA's entity registration in CAGE, and financial assistance award from USFWS are all in the name "Mississippi Interstate Cooperative Resource Association'.
        - I have made multiple attempts to add "Association" as a "Doing Business As" (DBA) name to the entity registration but legal documents (e.g., articles of incorporation, organization, or formation stamped by the filing authority; Secretary of State certificate of filing or good standing; IRS forms) are required to change an entity's name and both names must be on the documents add a DBA name.
        - Next step will be to request a name change with USFWS for Notice of Award and then with CAGE.

        - May need to attempt registering with a Secretary of State under both names.
        - Active entity registration is required by Code of Federal Regulations for federal financial assistance agreements.
            - Not clear what this means for MICRA's current (FY23) grant to support MRBP.
            - Will not be able to apply for an FY24 grant until registration is renewed.
- MICRA provided $6,000 approved in 2024 budget to USFWS as contributed funds to support the MICRA Coordinator in January 2024.
    - Excessive travel expenses in 2023 to attend MAFWA, SEAFWA, and North American to participate in briefings on MICRA fishery commission with agency Directors.
    - After paying travel costs through December 2023, available funding for 2024 is $5,300.
    - Contributed funds used to cover MICRA related office expenses, monthly cell phone, and MICRA related travel.
    - January travel for ANSTF and MICRA Executive Board meetings will put balance at approximately $3,000.
    - Additional funds to support coordinator travel through 2024 will likely be needed.
    - Projected travel for MICRA/MRBP includes:
        - UMRCC annual meeting (March) – on agenda to discuss MICRA's fishery commission initiative.
        - MRBP coordination meeting (April)
        - ANSTF and Panel Principals (April)
        - MICRA Fall meeting (TBD)
        - LMRCC meeting (TBD)
        - ANSTF and Panel Principals (November)
    - Additional travel for UMRBA, MRCTI, or other partner meetings or Congressional briefings is not currently planned.

<u>Status of MICRA Constitution and By-Laws Amendment</u>

- Amendments mailed to delegates on January 17, 2024; deadline is February 16
    - Added Immediate Chair-person to clarification about a single vote if serving the dual role as a sub-basin representative
- A reminder email is scheduled to be sent out on Monday, February 5
- A ¾ supporting majority of the 31 voting delegates (n=24) is needed for adoption.
- As of 1/26, 10 delegates have responded. All in favor of all amendments.
    - AR, CO, GA, IL, IN, KY, MN, ND, TX, WV

8) Arkansas-Red-White Rivers Sub-Basin Update

The following written update was compiled and submitted by Ken Cunningham.

ARKANSAS – *Submitted by Ben Battan*

- **Paddlefish Population Estimate for Arkansas River - Pool 13 in Arkansas** - AGFC biologists initiated a mark-recapture study to estimate the abundance of Paddlefish in Pool 13 of the Arkansas River. Staff tagged 328 Paddlefish in February 2023 and 222 in December. This baseline abundance estimate will be used to evaluate effects of the McClellan-Kerr Arkansas River Navigation System deepening project on this commercially important species, during and after dredging. Staff are also collecting data to assess size structure and demographic information for Pool 13 Paddlefish population.
- **Longnose Darter Species Status Assessment** – The AGFC Rivers and Streams Program sampled 150 sites on 20 rivers for the presence of Longnose Darters (*Percina nasuta*) to inform the ongoing USFWS Species Status Assessment. Sampling was focused on populations in the Arkansas and Upper White River drainages. AGFC staff observed 421 animals, greatly increasing the modern distributional records for the species. Genetic samples were also sent to Dr. Tom Near at Yale University to help resolve taxonomic confusion in the *Swainia* subgenus of darters.
- **2023 Federally Listed Mussel Stocking**s – The Arkansas Game and Fish Commission Mussel Conservation Program reared and released populations of three federally listed mussel species in 2023. Staff augmented the Archey Fork Little Red River with 584 Speckled Pocketbook, an endangered species that is endemic to the Little Red River watershed. They also released 332 individuals of the endangered Snuffbox mussel at three locations in the Spring River, one of only two rivers in Arkansas where they are known to occur, and 750 threatened Arkansas Fatmucket mussel at eight locations in the Saline River.
- **Invasive Carp Control and Research -** The AGFC Invasive Carp removal program fished 37 days in the Arkansas-Red-White rivers sub-basin during 2023. Staff harvested 2,728 Invasive Carp, which weighed 46,588 pounds. Several invasive carp research projects were also completed in 2023. Auburn Cooperative Fish and Wildlife Research Unit completed a project titled “Evaluating the spatial and temporal distribution and ecology of Bighead and Silver Carp and native fishes of the lower Red River basin”; Texas Tech University completed the project titled “Movement of Silver Carp and Bighead Carp in the Red River in Arkansas”; and the University of Arkansas at Pine Bluff completed the project “Population Characteristics, Movement, and Natal Origins of Silver Carp and Bighead Carp in the Arkansas and White Rivers”.

COLORADO – *Submitted by Matt Nicholl*

- Colorado Parks and Wildlife (CPW) has concluded a 2-year pilot watercraft inspection and decontamination (WID) program at Ports of Entry and other border areas. This pilot program proved to be effective and a viable supplement to CPW's existing WID Program. As a result, CPW, in collaboration with the Colorado State Patrol, will be implementing a full-time seasonal WID station at the Trinidad and Loma Ports of Entry in 2024 and will consider additional locations in future years.

KANSAS – *Submitted by Brian Sowards*

- Kanas Department of Wildlife and Parks (KDWP) has been working closely with Oklahoma Department of Wildlife Conservation (ODWC) on the Neosho River/Grand Lake carp projects funded within the Ark-Red-White Carp Partnerships.
- KDWP has also been conducting eDNA sampling throughout the Neosho River. Results are pending.

LOUISIANA - *Submitted by Kristi Butler*

- Giant Salvinia continues to be problematic on most of the Red River raft lakes and associated backwaters. The Louisiana Department of Wildlife and Fisheries (LDWFW) is taking an aggressive integrated pest management strategy to control giant salvinia in state waters. The strategy involves a three-pronged approach including chemical, mechanical, and biological methods to manage continued growth of the invasive plant. LDWF continues to work with and fund research through other state and federal agencies to explore biological control.
- A LA Tech fishing team caught a 5-fish Largemouth bag weighing 48 lbs 6 oz in December in Caney Creek Reservoir. We believe this to be an “unofficial” state record in Louisiana as official bag weight records are not kept.
- LDWF is a member agency in the Louisiana Watershed Initiative (LWI), which is tasked with reducing flood risk to people and property throughout the state. As part of the Initiative, hydrological models are being constructed across the state to aid in decision making and risk reduction. To bolster datasets and add real time monitoring capabilities, 34 new stream flow gauges have been placed in the Red River and Ouachita basins. LDWF is represented on multiple Technical Advisory Groups including Projects, Policy, Outreach, Data/Modeling, and Nature Based Solutions, and is advocating for fish and wildlife resource protection. Ideally, green infrastructure and “nature-based solutions” will be implemented, where possible.

- LDWF continues to monitor potential hydropower projects at the locks and dams on the Red River and discuss potential fisheries impacts. Currently, no construction is scheduled, but hydropower permits are in place for all structures. We are monitoring the proposed locks and dams above Shreveport.
- Louisiana experienced extreme drought across the state for most of the year, including the summer, which saw record-breaking temperatures. Fish kills were widespread and began to subside with cooler weather in the fall.
- The Red River experienced low water levels due to extreme drought across the region. This led to a request to pump unfiltered Red River water into the Cane River. A pump is in place with a filtering system that would eliminate invasive species such as zebra mussel veligers and invasive carps, but it has never been functional. The LDWF and FWS strongly oppose pumping the unfiltered water into the Cane River and are exploring solutions with the local authorities.
- LDWF continues to oversee research on invasive carps and potential control options in the Red River basin and across the state.

OKLAHOMA – *Submitted by Ken Cunningham*

- ODWC sampled 36 lakes during Spring 2023 for zebra mussel veligers, and all came back negative.
- ODWC has had two new reports within the last year of zebra mussel populations, one in Lynn Lane Reservoir, a drinking water reservoir directly downstream of the infested Oologah Reservoir, and the Red River below Texoma, which is infested.
- ODWC has roughly 25 pet stores across Oklahoma that we are working with in our *Don't Let It Loose Program*. This summer we distributed education materials to these businesses along with bags to send fish home in. We intend to keep them stocked up on bags and any other materials they may need to help keep the messaging going.
- The Lake Carl Blackwell Yellow Floating Heart population has been greatly depleted thanks to chemical applications carried out by OSU. They have also been recently experimenting with drone chemical application.
- The University of Georgia is looking at a toxic cyanobacteria that has been found living in/on hydrilla. ODWC sent them hydrilla samples from a few of our reservoirs to have them analyzed to determine if cyanobacteria are detected. Results are pending.
- ODWC hired two full-time technicians in November 2023, focused on ANS and invasive carp research and management.

- In 2023 ODWC removed 76 bighead carp from the Grand Lake system. Ageing of these fish is still in progress but results to date suggest there are multiple age groups, some of which are over 20 years old. All viable samples sent in for ploidy testing came back diploid. Females were highly fecund (anywhere from 8-11 million eggs in the largest individual) and the males were flowing. The smallest fish was still a little over 40 lbs. and the largest was 119 lbs. Microchemistry and genetics evaluations are ongoing.
- ODWC is preparing to send out another letter to paddlefish guides on Grand Lake asking them to target and remove any bighead carp they may encounter this upcoming snagging season.
- ODWC will soon begin collecting eDNA samples throughout the 28 miles between the Robert S. Kerr Reservoir Lock and Dam and the Arkansas border.

U.S. Fish and Wildlife Service – *Submitted by Brian Fillmore*

Invasive Carp

- Monitoring continues for presence of larval bighead carp.
- Acoustic telemetry efforts have resulted in 58 implanted bighead carp being tracked via 12 receivers.

Paddlefish

- Broodstock collections from the Arkansas River system are currently being collected and will be transported to the Tishomingo National Fish Hatchery (TNFH), spawned, and then returned to Grand Lake once spawning and recovery is complete. Progeny will be grown to 8” inches before being tagged. KDWP will transport and reintroduce these fish into John Redmond and Elk City Reservoirs.
    - Broodstock collections from the Red River have been completed. TNFH currently has 9” Adult Paddlefish for spawning in March, and the progeny will be grown to 12” before each will be tagged, transported and reintroduced into Caddo Lake, TX.
- A $25,000 grant has been awarded to Oklahoma State University to survey the Deep Fork and Kiamichi rivers for potential paddlefish spawning habitat.

9) Lower Mississippi River Sub-Basin Update

The following written update was compiled and submitted by Angie Rodgers.

Arkansas Game and Fish Commission

- **Mississippi River Catfish Sample Pilot Study** - The AGFC Large Rivers Biologist and District 4 Fisheries Management Biologists completed a pilot study to evaluate Blue and Flathead Catfish populations on the Mississippi River near Helena West-Helena, Arkansas. Sampling was completed in May, June, and September. Staff evaluated differences in catch rates using two electrofisher settings and obtained both spines and otoliths for age validation. Information from this pilot project will guide decision on the study design for a Mississippi River catfish study along the entire Arkansas border.
- **LMR Invasive Carp Control** - The AGFC Invasive Carp removal program fished 108 days in the Lower Mississippi River sub-basin during 2023. Staff harvested 6,928 Invasive Carp, which weighed 119,272 pounds.

Kentucky Department of Fish and Wildlife Resources

- KDFWR will continue its fish community electrofishing survey of the Mississippi River every other year. 2024 being the next year of sampling. Additionally, fish community surveys will continue to be conducted on some of our oxbow lakes located in our wildlife management areas.
- KDFWR sampled 9 shallow backwater sites for YOY invasive carp in 2023. None of these sites had black carp but 2 sites did have YOY silver carp. Several species of greatest conservation need were also collected during this effort. Including Blacktail shiner and Shoal shiner.
- Commercial harvest of invasive carp was reported to be 6943 pounds in 2023.
- 20 Paddlefish were reported harvested in the commercial fishery in 2023. Which was a decrease from the reports in 2022.
- As part of KDFWR's continued Alligator Gar restoration effort in the Four Rivers Basin Region of western Kentucky, 5,500 microwire tagged young-of-year were stocked in five Mississippi River floodplain lakes in Boatwright and Doug Travis Wildlife Management Areas, as well as lower Mayfield Creek, Obion Creek, and Bayou De Chien in August 2023.

Louisiana Department of Wildlife and Fisheries

- At Richard K Yancey WMA, habitat improvements including oversized culverts for fish passage and a weir to increase water levels during low-water events (when the Mississippi River disconnects from scar lakes) have been completed.

Low-water summer fish kills were common in the Black Hawk Scar Lakes, and in the past two drought years, there were none reported thanks to the increased water levels and improved water quality.

- Louisiana experienced extreme drought across the state for the majority of the year, including the summer, which saw record-breaking temperatures. Fish kills were widespread, and began to subside with cooler weather in the fall.
- Mussel surveys were completed in SW LA for Louisiana Pigtoe *Pleurobema ridellii* and Texas Heelsplitter *Potamilus amphichaenus*. Louisiana Pigtoe were found in a number of sites in the Calcasieu drainage, expanding their known range within the system. Full community samples were also taken. The Louisiana Pigtoe was listed as Federally Threatened throughout its range in 2023.
- LDWF continues to oversee research on invasive carps and potential control options in the LMR and across the state.
- A pair of Northern Snakeheads *Channa argus* with fry was observed within the levees on the LA portion of the Mississippi. This is the first verifiable report of the species in the state.
- For the second major drought year in a row, Zebra Mussels have been observed surviving elevated temperatures and salinities at the Wax Lake Outlet, a distributary of the Atchafalaya River.
- Invasive aquatic weeds continue to present major problems across the LMR. The Louisiana Department of Wildlife and Fisheries is taking an aggressive integrated pest management strategy to control invasive weeds in state waters. The strategy involves a three-pronged approach including chemical, mechanical, and biological methods to manage continued growth of the invasive plant. LDWF continues to work with and fund research through other state and federal agencies to explore biological control.
- LDWF is a member agency in the Louisiana Watershed Initiative (LWI), which is tasked with reducing flood risk to people and property throughout the state. As part of the Initiative, hydrological models are being constructed across the state to aid in decision making and risk reduction. To bolster datasets and add real time monitoring capabilities, 47 new stream flow gages have been placed in the LMR watersheds. LDWF is represented on multiple Technical Advisory Groups including Projects, Policy, Outreach, Data/Modeling, and Nature Based Solutions, and is advocating for fish and wildlife resource protection. Ideally, green infrastructure and “nature based solutions” will be implemented, where possible.
- It was discovered that shredded tires are being spread in floodplains and sand bars under beneficial use permits after LDWF received complaints of tires in the

Amite River. LDWF and USACE are working with LDEQ rewrite regulations and cease the practice.

Mississippi Department of Wildlife, Fisheries and Parks

- Staff administered five invasive carp research projects (Moon Lake movement, Eagle Lake movement, MS Alluvial Valley oxbow typology, MS Alluvial Valley Oxbow Distribution, LMR harvest removal) in the Delta Region.
- The Moon Lake invasive carp movement study revealed little immigration and emigration. Field tracking of 80 Silver Carp has concluded and the final report will be done once all the movement data are analyzed by Dr. Mike Colvin.
- The Eagle Lake carp movement project found that water control gates can prevent the passage of invasive carp. Field data collection is completed. The final report has been submitted and is currently being edited. .
- The MS Alluvial Valley oxbow typology project has been completed and we are awaiting the final report. The comprehensive first year report (over 100 pages) was submitted which mainly focuses on an analysis of the connectivity metrics, river discharges, and the spatial and temporal distribution of hydrologic connectivity in the oxbow lakes. Future work will develop alternative classification systems of connectivity relevant to invasive carp intrusion control and construct an online geospatial database with information on floodplain lake hydrologic connectivity.
- The MS Alluvial Valley Oxbow Distribution project organized and conducted interviews with 11 fisheries biologists from Mississippi, Louisiana, Kentucky, Illinois, Tennessee, Missouri, and Arkansas to collect carp presence data in randomly selected lakes. The student verified and compiled interview responses into a single file. The student gathered supplementary information about bigheaded carps in the LMAV including management plans, commercial fishing data, and creel survey data from fisheries biologists. The student performed a Permanova and ordination to determine if lakes surveyed for carp presences adequately represent the entire study area. The first annual report has been submitted and it is currently being edited.
- LMR harvest removal project: Since October 2021 we have had difficulty encouraging harvest of invasive carp from the MS River and Yazoo River Basin. Commercial fishermen were not interested in becoming contract workers to harvest these fish. We executed two contracts with carp processing firms in March and September 2021. MDWFP reimbursed one firm 18 cents per pound for invasive carp that were purchased by them for at least 25 cents per pound. From April – August 2021, a total of 80,584 pounds of invasive carp were harvested from the Mississippi River and the Yazoo River Basin by 3 commercial fishermen who fished for 52 days from March – August 2021. Silver carp

comprised 91% of the harvest. One processor was reimbursed a total of $14,505.12.

- Contracts with two more firms were signed in January 2023. The total amount of invasive carp purchased in CY2021-CY2022 was 105,570 pounds (92.87% Silver Carp). We spent $19,002.60 to reimburse the firms for purchasing these fish. An additional 15,009 pounds of invasive carp (13,909 lbs. Silver Carp, 900 lbs. Bighead Carp and 200 pounds of Grass Carp) were purchased by one firm outside of their contract period so they were not reimbursed for these purchases.
- In August of 2022, MDWFP began advertising to hire two temporary employees to harvest invasive carp from the project area. This is an effort like what the AGFC has done. In 2022 we were not able to find two qualified job applicants and we submitted a no cost grant extension amendment to the USFWS to extend the period to May 2026. Since we were not able to find two people willing to work as temporary employees, we again promoted fish processor reimbursement contract to four firms ---- Moon River Foods in MS; North American Caviar in TN, Ecoharvest/Impact Fisheries in MO, and INVERSA Leather in FL. All these firms signed January – June 2024 reimbursement contracts where MDWFP reimburses them either 18 cents per pound if they pay at least 25 cents per pound or 5 cents per pound if the firm supplies the boats, nets, fuel, and other equipment to the fishermen.
- MDWFP submitted a $200,000 request to use the additional FY24 federal invasive carp funding to continue to provide reimbursement to invasive carp processing firms.
- Two of the firms have contacted a state and federal lobbying firm to get state appropriations to support their purchases of invasive carp.

Missouri Department of Conservation

Electrofishing data summary for evaluation of incentivized harvest in LMR.

To evaluate the effectiveness of incentivized harvest of Invasive Carp in the LMR, the MDC began a community sampling approach, similar to Long Term Resource Monitoring sampling in the UMR. During the fall of 2023, we completed ten standardized electrofishing sites within a relatively small stretch of river due to extremely low water. This effort produced a total of 770 fish from 33 unique species. Only five Invasive Carp were captured, all of which were Silver Carp (656 – 751 mm). Emerald Shiners and Gizzard Shad made up 62% of the total catch. We hope to continue this sampling to gather long term data evaluating the effects of Invasive Carp harvest on the fish community. Contact: Joshua.Abner@mdc.mo.gov

Invasive Carp Telemetry in mainstem LMR

The Mississippi River Science Unit has maintained a statewide telemetry array for over a decade now. In more recent years, the array has been expanded to help focus on Invasive Carp research. No new receivers or transmitters went into the LMR during 2023. Prior to the array expansion in 2021, there were 3 receivers in the LMR; currently, there are ten receivers. 100 acoustic transmitters were also implanted in Silver Carp from the LMR during 2021. Continued monitoring and maintenance of this array will assist in the management of our native species, as well as help focus on locations where Invasive Carp removal efforts could prove most beneficial.
Contact: Joshua.Abner@mdc.mo.gov

Missouri Incentivized Carp Harvest Program (MO-ICHP)

In October 2023, the MO-ICHP commenced as part of a large-scale, multi-agency effort to suppress carp populations, reduce their spread, and prevent/minimize further impacts to native ecosystems. The Program offers 10¢ per pound for invasive carp (Silver, Bighead, Grass, and Black Carps) caught in designated waters of the Mississippi River and sold to a buyer for at least 7¢ per pound. Designated waters include Pools 20, 21, 22, 24, and 25 of the upper Mississippi River and Missouri's portion of the lower Mississippi River (LMR) from the Ohio River confluence to the Missouri-Arkansas border. Mississippi River efforts will provide experience and knowledge needed to be successful in new areas such as the Missouri River and improve/expand the program in the future. As of January 2024, 25 commercial fishers are enrolled in the Program and 224,829 lbs. of Silver Carp have been harvested (Pool 20: 63,084 lbs., Pool 22: 20,094 lbs., Pool 24: 17,384 lbs., LMR: 84,484 lbs.). Contact: Joe.McMullen@mdc.mo.gov

Big River Shovelnose Sturgeon Assessment

In Fall 2024, a multi-year assessment of Missouri and Mississippi river shovelnose sturgeon populations and fisheries will commence. The project is needed to determine the need for regulation changes in order to maintain healthy populations of shovelnose sturgeon and sustainable commercial fisheries on the upper Mississippi River. Given uncertainties associated with traditional, age-based methods of mortality estimation, the project will also seek to identify the most appropriate, alternative methods of estimating mortality (e.g., length, telemetry, mark-recapture). Ultimately, the project will seek to identify a commercial minimum length limit that will limit total annual mortality to <20 percent. Contact: Joe.McMullen@mdc.mo.gov

Black River Walleye

A walleye exploitation and movement study on the Lower Black River was continued during 2023. This study is providing angler exploitation rates which are critical for

population modeling. The Black River basin (includes Black, Current, and Eleven Point rivers) supports a distinct walleye genetic strain (i.e., Black River Strain). Previous exploitation rate observed in 2009 and 2010, indicate that this walleye fishery could become over-exploited. External tags include a combination of high ($75) and low ($25) value reward tags. In 2023, a total of 358 walleye were captured of which 275 walleye were tagged. Additionally, we have implanted transmitters in 37 Walleye across the Black River basin. It looks like there are 3 movements groups that are starting to emerge. Some walleye are making a 200-mile run up the Black River to spawn in the early spring and then move back to the Current River for the rest of the year. More to come in spring 2024. Contact: Paul.Cieslewicz@mdc.mo.gov

St Francis River Inventory

The St. Francis River is a biologically rich aquatic ecosystem that is designated by MDC as a Stream Reach Conservation Opportunity Area. Approximately 105 fish species, including 26 species of conservation concern (SOCC), have been documented in the St. Francis River below Wappapello Reservoir. Our objective is to conduct a standardized, drainage-wide survey of fish assemblages below Wappapello Reservoir. We stratified a 106-mile reach into 3 equal segments and completed a two-week sampling effort using daytime electrofishing and benthic trawling. Low water levels made access challenging. New fish species records for the basin and updated distributional information is being reviewed. Data and preserved fish specimens are being summarized for a survey report to be completed in July 2024. Contact: Dave.Knuth@mdc.mo.gov

Paddlefish exploitation and movement in lower Black and St Francis Rivers

Jaw band tagging and transmitter implanted paddlefish began as early as 1996. Initially it appeared exploitation and movement of paddlefish harvest is higher in the Black River than the St. Francis River. However, St. Francis River transmitter fish were harvested at comparable rates to the Black River estimates. The tagging study showed that the Black River paddlefish population had the highest harvest rates in the state. The recent regulation change to 32 inches is being evaluated in both systems. Witihn the St Francis River, size structure is good with fish up to 80 pound paddlefish being captured. Most notably is the capture of a CWT tagged paddlefish in the St Francis River that originated in the Black River. Some tagged paddlefish within these rivers have shown large scale movement into the main stem and throughout the MS River basin.
Contact: David.Ostendorf@mdc.mo.gov

Tennessee Wildlife Resources Agency

- TWRA continued work with the LMR Invasive Carp Subbasin Partnership to develop and implement projects
- Staff are establishing a component of the existing TCHIP program on the Mississippi River and anticipate removals/reimbursements to commence in early 2024.
- TWRA continued efforts to implant invasive carp with acoustic transmitters at Reelfoot Lake to document movement and spillway passage events.
- Paddlefish: Mississippi River (Densford Dike)
- Assess paddlefish/sturgeon usage at Densford Dike Notching project (FY24 and FY25)

Lower Mississippi River Conservation Committee

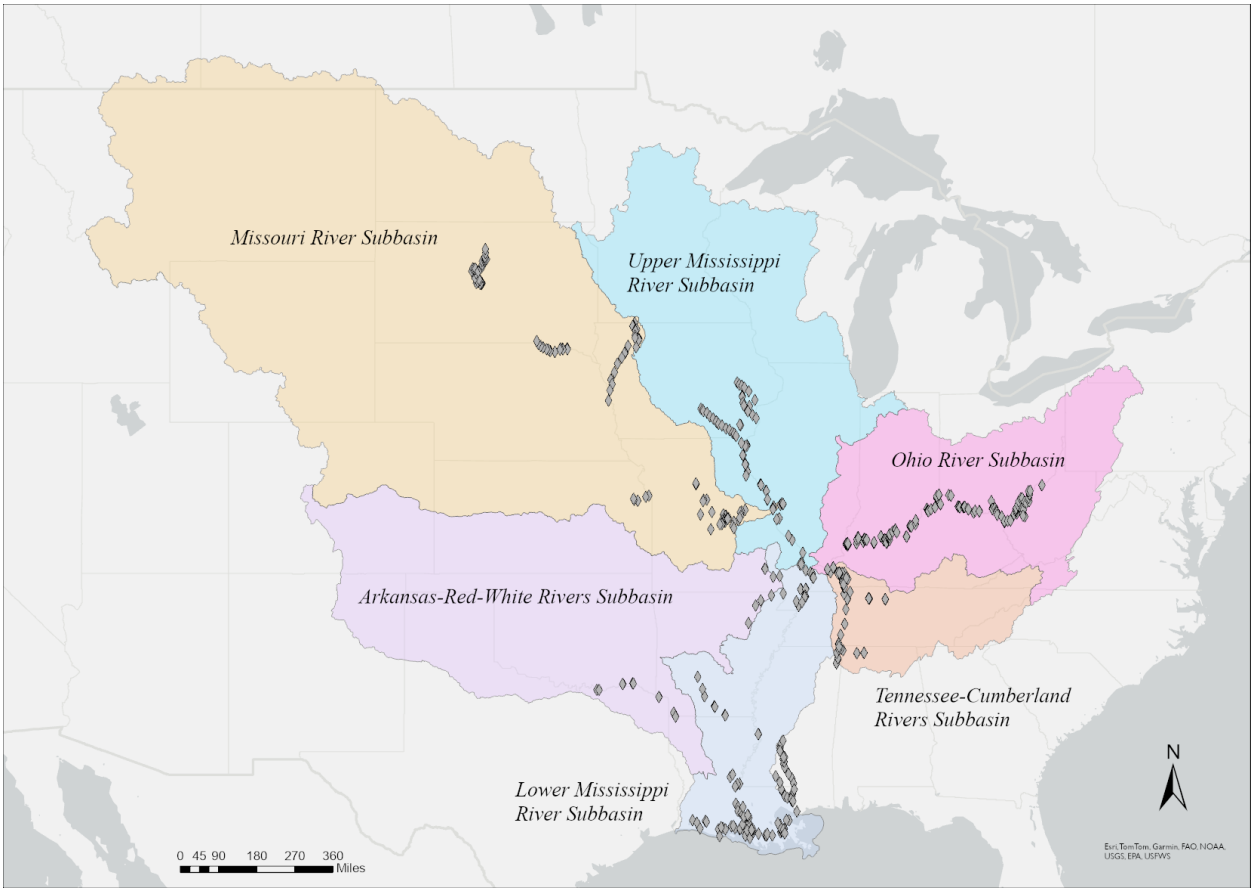
- **Hatchie-Loosahatchie Mississippi River Ecosystem Restoration Study**
  The Lower Mississippi River Conservation Committee (LMRCC) serves as the non-federal cost-share partner for the feasibility study for Conservation Reach 2 – Hatchie River to Loosahatchie River. The Project Development Team finalized the integrated feasibility report and environmental assessment in late December 2023 and submitted to Mississippi Valley Division. The Chief's Report is anticipated to be released in 3rd quarter of 2024. Additional information on the study can be found here. Moving to the construction phase will require Congressional authorization and a non-federal sponsor(s). This is the first large-scale ecosystem restoration study on the Lower Mississippi River and the LMRCC is working with partners to advance additional conservation reaches identified within the Lower Mississippi River Resource Assessment.

- **Habitat Restoration**
  LMRCC applied for 2023 National Fish and Wildlife Foundation Lower Mississippi Alluvial Valley Funds to increase flows in the Island 84 (RM 533) secondary channel, in addition to continuing installing woody debris traps in already restored secondary channels, based on the pilot project completed in January 2023 at Prairie Point secondary channel (RM 665) near Helena, Arkansas. Funding will also be used to continue floodplain restoration monitoring at the Loch Leven (MS) restoration site.

- **Annual Meeting**
  The LMRCC held its annual meeting September 26-27, 2023 in Vicksburg, MS. The 2024 annual meeting is tentatively scheduled for this summer.

Lower Mississippi River Fish and Wildlife Conservation Office (LMRFWCO – USFWS)

- In Spring 2023, the LMRFWCO and several partner offices conducted an adult Alligator Gar *Atractosteus spatula* population assessment in Lake George. Lake George, Panther Swamp National Wildlife Refuge, Mississippi, supports one of the remnant populations of Alligator Gar in the Mississippi River Basin is one of the sources of gametes for the federal Alligator Gar brood program. In total, crews set 45 gills nets throughout Lake George and captured 23 adult Alligator Gar ranging from approximately 30-100 pounds. Fifteen of these individuals were brought back to Private John Allen National Fish Hatchery to produce fry for transfers to the following states: AR, LA, OK, IL, KY, GA
- LMRFWCO staff continue to assist with invasive carp coordination efforts for the LMR and ARW, including preliminary testing of a population model to assist the invasive carp partnership with planning and evaluation efforts. Related efforts include working with partners to improve the spatial grain within management scope, establishment of a problem statement, and SMART management objectives that can be used in decision analysis.
- The LMRFWCO initiated an invasive carp gear comparison project in backwater habitats of the LMR and ARW. This project aims to compare the feasibility, effectiveness, and efficiency of different gear types that have been used in other basis to target and capture invasive carps. Spring and fall 2023 sampling was conducted, with continued biannual sampling planned through 2025. Staff demonstrated sampling techniques with AGFC in Fall 2023 and have plans to demonstrate gear with LDWF in Spring 2024. These efforts are designed to dovetails with forthcoming recommendations from the Sampling Analysis Workgroup (SAW) to facilitate sharing of information on gear deployment in unique habitats of the basin.
- Lower Mississippi River FWCO staff finalized the third data update of the Acoustic Telemetry Lookup Tool (TLT). This version (V1.2023.09) contained data from 36 acoustic tracking projects throughout the Lower Mississippi River Basin, which included approximately 600 receiver deployments and 6000 acoustic tag ids. After the third update, it is apparent the tool continues to grow with the addition of tags and receivers and is supported by partners within the basin. However, the current TLT, utilizing an HTML platform, is nearing maximum capacity. Therefore, to maintain this partnership need, the LMRFWCO will need to transition to a different platform, or prepare these data for entry into a more comprehensive tool.



USFWS Tag Lookup Tool V1.2023.09 partner receiver deployment locations throughout the Mississippi River Basin.

10) Missouri River Sub-Basin Update

Information:

Written update not submitted.

11) Ohio River Sub-Basin Update

Information:

Written update not submitted.

12) Tennessee-Cumberland Rivers Sub-Basin Update

The following written update was compiled and submitted by Dave Dreves.

Alabama Wildlife & Freshwater Fisheries Division
Chris Greene responded and had nothing new to share.

Kentucky Department of Fish and Wildlife Resources (Report provided by Josh Tompkins)

- KDFWR continues to promote the harvest of invasive carp from Kentucky waters through routine contact with commercial fishers and fish processors. There are currently four companies in Kentucky that purchase Invasive carp from commercial fishers. KDFWR employees conduct ride-alongs with commercial fishers who are participating in the Invasive Carp Harvest Program (ICHP), which allows commercial access to closed waters for the purpose of Invasive carp harvest. Most of the commercial effort for invasive carp is on the Cumberland River and its associated reservoir, Lake Barkley. Additional commercial effort occurs on the Mississippi, Ohio, and Tennessee Rivers as well. In 2023 commercial harvest of invasive carp from the TNCR exceeded 11.6 million pounds with over 9 million pounds harvested from Barkley reservoir, 1.6 million pounds from Kentucky reservoir and 855,000 pounds from the Cumberland River (mostly from the Barkley tailwaters).
- KDFWR continues to conduct standardized sampling with gill nets for Invasive carp in the Kentucky and Barkley reservoirs of the Tennessee and Cumberland rivers respectively. Data collected from fish captured through this sampling is used to monitor population demographics of Invasive carp in each reservoir. The efficacy of this method is being evaluated for replacement by more standard methods throughout the TNCR.
- KDFWR remains actively engaged as a partner with the USFWS to test the Bio-Acoustic Fish Fence (BAFF) at Lake Barkley Lock. In 2023 KDFWR continued to provide weekly onsite maintenance of the BAFF, monthly telemetry system offloads/service through October, and coordinated fish tagging efforts in the spring. In 2023 KDFWR facilitated tagging of 733 fish in 7 days for the BAFF and telemetry studies. The following is a breakdown of the tagged fish: 200 HTI silver carp, Barkley translocated; 240 HTI silver carp, Barkley TW; 20 Vemco smallmouth buffalo, Barkley TW; 20 Vemco freshwater drum, Barkley TW; 28 Vemco paddlefish, Barkley TW; 3 Vemco lake sturgeon, Barkley TW; 13 Vemco blue suckers, Barkley TW; 40 grass carp, Barkley TW; 54 Vemco silver carp, Barkley reservoir; 50 Vemco silver carp, Kentucky reservoir; 30 Vemco silver carp, Kentucky TW; 35 Vemco silver carp,

Kentucky translocated. In October of 2023 the Barkley BAFF project initial experimental study period ended and the system was transitioned to a full-on state.

- KDFWR continues to maintain an extensive telemetry monitoring array in the Ohio River basin. Information gathered is shared with partners and receiver location and active tag information is available through the USFWS telemetry look up tool. The Murray Kentucky staff maintain over 70 data collection receivers.
- KDFWR participated in the TNCR-TTW Deterrent Decision Analysis led by the USGS. KDFWR provided data and perspective from our agency for the modeling to develop deterrent location recommendations for the TNCR-TTW.
- KDFWR maintained the community sampling conducted in the tailwaters of Kentucky and Barkley Dams on the Tennessee and Cumberland rivers respectively, throughout 2023. Data collected through this long-term sampling is being analyzed to determine impacts Invasive carp may be having on native fish communities in these areas. However, due to the unnatural nature of the tailwater areas, no direct negative impacts on sportfish have been correlated to Invasive carp thus far. In 2023, KDFWR conducted a creel survey on Kentucky reservoir to monitor impacts of Invasive carp populations on anglers fishing in the tailwaters. Creel data is still being analyzed at this time. This survey is on a three-year rotation and will be surveying Barkley reservoir in 2024.
- KDFWR sampled 22 sites on the lower Tennessee and Cumberland rivers for YOY invasive carp. None were found in 2023.
- KDFWR partnered with the USFWS Columbia office to conduct paupier sampling in Kentucky reservoir in 2023. This effort continues to add valuable information regarding the silver carp population trends in the reservoir. It also is producing useful information about the gears efficacy in large reservoir systems.
- The industrial ice machine maintained by KDFWR was not fully operational for the majority of 2023.
- KDFWR commercial fishing workgroup worked to monitor statewide commercial fishing policies and activities in 2023. A commercial fishing guidebook was drafted in 2023 and is anticipated to be completed in 2024.
- 539 Paddlefish were reported harvested in the commercial fishery in 2023. Which was a decrease from reports in 2022.
- As part of KDFWR’s continued Alligator Gar restoration effort in the Four Rivers Basin Region of western Kentucky, 3,243 microwire tagged young-of-year were stocked at two locations in the Clarks River (lower Tennessee River drainage) in August 2023. In addition, two Age-3 (30+ inch) individuals were surgically implanted with ultrasonic tags and fitted with external satellite tags; these fish were released into the lower Clarks River and their movements are being monitored.
- KDFWR continued its Lake Sturgeon restoration effort in the upper Cumberland River drainage during 2023 through stocking young-of-year followed by mark-

recapture sampling using baited trotlines. A total of 10,528 young-of-year were stocked in the Cumberland River (7,161) and Big South Fork (3,367) between July and October. In December, trotline sampling produced 150 individuals (CPUE=6.3 fish/line) in the Cumberland River and 10 individuals (CPUE=0.8 fish/line). Mean fork-length at age of capture indicates growth of stocked fish appears to be good. On average individuals exceeded 20 in. by Age-3 and were nearly 40 in. by Age-12.

Mississippi Dept. of Wildlife, Fisheries, and Parks (Report provided by Jerry Brown)

Report from Dustin Rodgers; NE Region Fisheries Biologist:

We are maintaining the current receiver array, downloading, and sending data to USGS monthly. Joint sampling efforts by biologists in MDWFP's Northeast Region and the USFWS Lower Mississippi River Fish and Wildlife Conservation Office occurred in the upper pools of the Tennessee-Tombigbee Waterway (Locks E and D) in the spring and fall of 2023. In 2023, 80 sites were sampled with two gear types. An additional sampling took place in June of 2023 with crews from Alabama Department of Conservation and Natural Resources and the US Fish and Wildlife Service providing additional electrofishing boats. In each pool from pools A-E, three boats pushed two sites (dam and channel). Eight embayments in Bay Springs Lake were also sampled using three electrofishing boats.

No invasive carp were observed or captured during these events, suggesting carp densities likely remain low in the upper pools of the Tennessee Tombigbee Waterway (TTW). Monitoring will continue in these pools and additional sampling methods will be utiliized, as resources allow, to increase confidence that lack of observation represents true absence. To date, no invasive carp have been detected (seen while on the Tennessee Tombigbee Waterway, through our fall sampling, or through specific carp sampling) or positively identified on the TTW. In 2023, targeted sampling for invasive carp occurred in March and October. Spring and fall sampling consisted of electrofishing and dozer trawling for ten sites each for Pools D and E.

Report from Dennis Riecke; Fisheries Coordinator:

We are participating in the USACE Nashville District WRDA meetings concerning barrier locations on the TTW and the Tennessee Wildlife Federation invasive carp calls.

The Mississippi State University grant funded project titled *"TNCR DATA MANAGEMENT APPLICATION"* for TNCR is complete and the final report has been submitted.

The second project under the TNCR data management application grant project was to literature review titled. "*impacts of invasive carps on native fish and their habitats, and options for addressing these impacts in the Tennessee and Cumberland rivers***".** The final report for this was submitted and it is being edited.

Since were not successful in getting any contract fishers or processors to harvest fish from Pickwick Lake we got a change of scope approved for that grant to do a project through Mississippi State University titled *INVASIVE BIGHEADED CARP DISTRIBUTION PATTERNS IN OXBOW LAKES OF THE LOWER MISSISSIPPI ALLUVIAL VALLEY.* The first annual report for that project has been submitted and it is being edited.

North Carolina Wildlife Resources Commission (Report provided by Corey Oakley)

Project Title: French Broad River Revival,
Partners: US Fish and Wildlife Service, Tennessee Wildlife Resources Agency
Need: From its headwaters in North Carolina to where it joins the Holston River to create the Tennessee River in East Tennessee, the French Broad River is home to an exceptionally high aquatic biodiversity. The recent publication, An Annotated Atlas of Freshwater Fishes of North Carolina (Tracy et al. 2020), documented ~76 indigenous fish species from historical and recent collection data from the North Carolina sections of the French Broad River Basin. However, anthropogenic alteration over the last few centuries in the French Broad River and its tributaries have led to extirpations and population declines for many of its known and unknown historical species. Since Congress passed the Clean Water Act in 1972, the water quality of the French Broad River has drastically improved, but barriers to expansion (e.g. dams) limit the potential recovery of many historical fish species without stocking or translocation.

Summary of Activities: In 2023, NC Wildlife Resource Commission (NCWRC) biologists stocked Lake Sturgeon, Gizzard Shad, Smallmouth Buffalo, Black Buffalo, Smallmouth Redhorse, and Freshwater Drum in the French Broad River (Table 1). Lake Sturgeon were stocked in the French Broad River in Madison County, downstream of the mainstem dams. Smallmouth Buffalo, Black Buffalo, and Smallmouth Redhorse were collected in the lower French Broad River downstream of the dams and were translocated upstream of the dams in the upper French Broad River between the two completed slough projects. Gizzard Shad and Freshwater Drum were collected by Tennessee Wildlife Resources Agency near Douglas Lake on the French Broad and Nolichucky rivers and translocated by NCWRC to the upper French Broad River between the two slough projects.

Recaptures and Evidence of Success:
All species other than Lake Sturgeon were detected through stationary PIT antennas located in the sloughs, boat electrofishing monitoring efforts or angler reports (Table 2). The most promising observation, a young of the year Gizzard Shad, was collected in the Mud Creek Slough. This encouraging observation suggests immediate reproduction following 2023 stocking efforts.

Table 1. Summary of 2023 stocking efforts.

Common Name	Scientific Name	2023 Summary	Year of 1st Stocking
Lake Sturgeon	*Acipenser fulvescens*	1572	2015
Gizzard Shad	*Dorosoma cepedianum*	71	2023
Smallmouth Buffalo	*Ictiobus bubalus*	53	2022
Black Buffalo	*Ictiobus niger*	14	2022
Smallmouth Redhorse	*Moxostoma breviceps*	171	2022
Freshwater Drum	*Aplodinotus grunniens*	106	2023

Table 2. Summary of 2023 reintroduced species detections.

Common Name	PIT Antenna Detection	Electrofishing Detection	Angler Report
Gizzard Shad	Both Sloughs	X	
Smallmouth Buffalo	Mud Creek Slough		
Black Buffalo	Pleasant Grove Slough		
Smallmouth Redhorse	No detection	X	
Freshwater Drum	Pleasant Grove Slough		X

Magazine Article
NCWRC staff also wrote an article for May/June 2023 issue of their department magazine that continued their efforts to sound the alarm of the hazards of the illegal introduction of Alabama Bass to North Carolina waters.

UNWELCOME VISITORS

The introduction of invasive species in North Carolina threatens many native species and could forever change our natural landscape

WRITTEN BY COMMISSION STAFF

Invasive species come in all shapes and sizes and vary in types of animals and plants. They can be small, like the emerald ash borer (a beetle that has devastated ash trees across the country and in North Carolina) and zebra mussel (a fingernail-sized mollusk that can clog water filtration pipelines and alter water quality). Invasive species can be large, like flathead and blue catfish (which have outcompeted native catfish species in North Carolina waters) and tree of heaven (a fast-growing plant that can overwhelm and displace native species).

Invasive species are introduced to an area outside of its original range, sometimes through natural migration but more commonly through human activities, like freight shipping, pet trade and accidental release. Once established, they can be difficult to control and have a dramatic impact on humans, wildlife and the environment. Approximately 42 percent of Threatened and Endangered species in the United States are at risk due to invasive species.

In this article, we highlight three of the many invasive species that are a concern in North Carolina: Alabama bass, feral swine and red-swamp crayfish. Although this article focuses on these three species, many of the lessons learned and tips for limiting their spread can relate to many other invasive species, from avoiding releasing or relocating to learning how to identify species.

To learn more about our native species and what can be done to help protect them, visit ncwildlife.org/learning.

Commission biologists use a shocking boat on Lake James to study smallmouth bass and Alabama bass. Opposite: Biologists Doug Besler (left) and Chris Wood (right) take fin clippings as part of genetic testing to determine the extent of hybridization between smallmouth bass and Alabama bass.

MELISSA McGAW HOWIE

A BASS OF MISTAKEN IDENTITY Since the 1970s, Alabama bass *(Micropterus henshalli)* have been moved and become established outside their native range of the Mobile River Basin in central Alabama, northwestern Georgia, eastern-central Mississippi and the southeastern corner of Tennessee. Unauthorized angler introductions represent most Alabama bass translocations across the Southeast, including many confirmed introductions in North Carolina.

Alabama bass were mistakenly identified as spotted bass *(Micropterus punctulatus)* for over 30 years due to their similarity of appearance. Around 2008, confirmation that these two bass are different species was accepted among university researchers and resource agencies when identification of these two species was verified with detailed anatomical counts and measurements and confirmed with genetic testing.

To date, N.C. Wildlife Resources Commission fisheries staff have genetically tested and confirmed Alabama bass are established in 30 waterbodies in the Tar Heel state, mostly in the Mountains and Piedmont. Sadly, this invasive, non-native bass is likely making its way eastward with recent reported occurrences in the Roanoke and Tar rivers.

History of Alabama Bass in North Carolina

The first known occurrence of Alabama bass in North Carolina was in the early 1980s along the North Carolina-Georgia border in Lake Chatuge. In the two decades that followed, Alabama bass were illegally moved by anglers into many nearby impoundments in western North Carolina (e.g., Apalachia, Fontana, Glenville, Hiwassee, Julian, Nantahala, Santeetlah), with Lake Chatuge and the upper Savannah River Basin impoundments (Jocassee, Keowee, Hartwell) in South Carolina as the likely sources.

By 2001, Alabama bass introductions were documented in the Piedmont in Lake Norman. Alabama bass then were transported to other Catawba River lakes (e.g., James, Rhodhiss, Hickory, Lookout Shoals) upstream of Lake Norman in the early-to-mid 2000s, before being spread into central Piedmont impoundments in recent years.

Irreversible Consequences

Smallmouth bass *(Micropterus dolomieu)* and spotted bass are native to drainages in western North Carolina that flow into the Mississippi River Basin. In every reservoir or river system where Alabama bass have been spread, native smallmouth bass and spotted bass populations have been dramatically impacted.

Commission staff have learned through genetic testing that Alabama bass rapidly hybridize with smallmouth bass and spotted bass. The rate of hybridization is alarming. Within 10 to 15 years after Alabama bass become established, hybridization occurrence with smallmouth bass and spotted bass is 50–60%; 20 to 30 years out from the initial introductions, hybridization rates increase to 80–90%. Over time, the proportion of Alabama bass genes swamp-out smallmouth bass and spotted bass genes, and the two native species are irreversibly replaced.

Largemouth bass *(Micropterus salmoides)*, also native to North Carolina, are impacted by Alabama bass differently. Although hybridization between Alabama bass and largemouth bass does occur, the

ALABAMA BASS

MELISSA McGAW/NCWRC

ILLUSTRATIONS BY JOSEPH R. TOMELLERI

rate of hybridization is low. The primary impact to largemouth bass is through resource competition. Largemouth bass are efficient at what they do, but Alabama bass have a wider range of habitat and feeding tolerances and operate more successfully in the margins that are limiting to largemouth bass (e.g., deeper water, open water, low productivity zones, etc.). Therefore, largemouth bass are impacted by direct competition for available resources, which ultimately lowers their abundance over time. The outcome is that largemouth bass will be replaced to varying degrees by smaller, less-desirable Alabama bass.

What Can Be Done?

It is illegal to move or stock fish into public waters without a stocking permit from the Commission. If you observe or have knowledge of illegal Alabama bass stockings, report it by calling 800-662-7137.

If you catch an Alabama bass in a waterbody where they have not been previously documented, take photographs and report it at PublicInquiry-FishWildlife@ncwildlife.org.

It is not possible to eradicate Alabama bass where they become established, but reducing their numbers as much as possible will minimize their impacts on native species. There is no size or creel limit for Alabama bass, and anglers are encouraged to harvest unlimited numbers of them of any size.

Publicity and angler education efforts are ongoing, so be on the lookout for the updated black bass webpage, news stories and informational signage to be posted at public fishing and boating access areas.

—David Goodfred, District 8 Fisheries Biologist
—Kin Hodges, District 7 Fisheries Biologist
—Scott Loftis, Mountain Aquatic Habitat Coordinator

Tennessee Wildlife Resources Agency (Report provided by Jason Henegar)

MICRA TNCR ANS UPDATE

- TWRA continued work with the TNCR Invasive Carp Subbasin Partnership to develop and implement projects and represented the TNCR on the ICAC
    - Larval carp sampling, initiated in 2016, continued for Kentucky and Barkley reservoirs; no evidence of successful recruitment by invasive carp has been detected.
    - TWRA worked with state (AL, MS, KY) and federal (USGS, USFWS, TVA) partners to implant acoustic transmitters in Silver Carp at Cheatham and Pickwick reservoirs; these efforts are informing our understanding of lock and dam passage and carp movement triggers/patterns.
    - TWRA continued surveillance efforts in the Upper TN River; no Silver Carp have been detected since this effort was initiated in response to the angler reported Silver Carp from 2019. In 2023, staff conducted 43 hours of electrofishing effort as part of this surveillance.
    - TWRA's Tennessee Carp Harvest Incentive Program has subsidized the harvest of nearly 29,000,000 lbs of invasive carp as of Dec 31, 2023 (since the beginning of the program in Sept. 2018).
    - TWRA continued work with state and federal partners, utilizing structured decision-making processes to prioritize locations for invasive carp deterrents.

MICRA PADDLEFISH MANAGEMENT UPDATE

- TN River Paddlefish Project (Kentucky Lake)
    - Assessing the paddlefish stock for Kentucky Reservoir (FY24, FY25 and FY 26).
    - Assess growth, mortality, and recruitment of current paddlefish stocks from prior research (Hoffnagle and Timmons 1989 and Scholten and Bettoli 2005).

13) Upper Mississippi River Sub-Basin Update

Information:

Written update not submitted.

14) Federal Entity Updates

USFWS

Written update not submitted.

USGS

- Significant progress has been made on the document "Sturgeon and Paddlefish Research in the US Geological Survey - Past Activities and Future Directions", a comprehensive science summary document cooperatively developed by the USGS Sturgeon and Paddlefish Workgroup, a diverse team of 45 science staff from 19 USGS center and program areas.
- The document is a comprehensive report on sturgeon and paddlefish research in North America, with the current draft form presented in five sections.
    - Part I introduces the executive summary, document overview, purpose, and intended use, emphasizing the need for research in this field. It also highlights USGS' interdisciplinary roles, capacities, scientists' expertise, and science centers related to sturgeon and paddlefish research.
    - Part II provides an overview of North American acipenseriformes, presenting a list of species with threats and conservation status. Each species, including Alabama Sturgeon, American Paddlefish, and others, is detailed with distribution, life histories, status, threats, and research notes.
    - Part III outlines USGS' strategic science vision for sturgeon and paddlefish research, categorizing research themes such as life history, ecology, threats, and stressors. Each theme includes topics, summaries of past efforts, and future research directions.
    - Part IV emphasizes USGS' relevancy to the public, government, and research collaborators, showcasing examples of projects and efforts.
    - Part V addresses data and information needs for sturgeon and paddlefish research, proposing the creation of a national USGS data and research network.
    - Part VI of the document includes a comprehensive appendix compiling all USGS research products on sturgeon and paddlefish to date and also identifies USG contact information for ongoing research.
- Anticipate USGS asking for agency/partner input and comment sometime in mid-summer.
- Current target completion (publication) date is by end of calendar year 2024.

15) Legislative, Policy, and Outreach Next Steps

Discussion:

Ashlee Smith will provide an update and lead this discussion with the Executive Board.

16) 2024 DC Fly-in Preparation

Discussion:

Ashlee Smith will provide an update and lead this discussion with the Executive Board.

17) Invasive Carp Advisory Committee Update

Discussion:

Rob Simmonds, USFWS, and Brian Schoenung, IL DNR, will provide the Executive Board with an update on the Invasive Carp Advisory Committee.

18) Sub-basin Invasive Carp Partnership Coordinators Update

Information:

The sub-basin invasive carp partnership coordinators will provide an update on collaborative development of sub-basin scale objectives and project proposals for USFWS FY24 invasive carp funding consideration.

19) Wildlife Forever

Discussion:

Pat Conzemius, Wildlife Forever CEO, will join the Executive Board via Zoom at 4:00pm (EST) for a continued discussion about collaboration on invasive carp communications and policy outreach. The following Action Item resulted from the board's discussion following the meeting with Conzemius during the board's February 2023 meeting. The board may want to revisit this Action Item following the discussion with Conzemius.

> The MICRA Executive Board and invasive carp committees will consider ways to engage with NGO's (e.g., Wildlife Forever) so they are more informed and aware of the collaborative inter-agency efforts to manage and control invasive carp throughout the basin.

20) Tour of Tennessee Aquarium Conservation Institute

Information:

Executive Board members will meet in the classroom and for a 1-hour tour of the Conservation Institute research facilities at 8:30.

21) Paddlefish Sturgeon Committee Update

Information:

Sara Tripp, IL DNR, will provide the Executive Board with an update on the Paddlefish/Sturgeon Committee. Topics for discussion will include:

- Support letter for North American Sturgeon and Paddlefish Society's (NASPS) initiative for establishing National Sturgeon Day on October 27th.
    - NASPS was requested to pay more money than they were willing to commit.
    - Re-evaluating and may implement a small fund-raising campaign to assist with the cost.
    - May require a vote of the governing board at their next meeting on 9/21.
- Basinwide Paddlefish Management Framework progress delayed.
    - The framework workgroup held several virtual meetings early in 2023 to begin work on the framework.
    - Dr. Scarnecchia was out of commission for personal health reasons for nearly the last 9-months.
    - He has resumed work on the framework and expects to provide the committee with a draft by late summer.
    - The workgroup will review the framework and consider the need for an in-person meeting this fall to move the document along.
- Committee Meeting
    - The committee typically meets in the first quarter of the calendar year.
    - The Chair will be recommending a brief virtual meeting in the first quarter and an in-person meeting in early Fall in conjunction with a meeting of the framework workgroup.

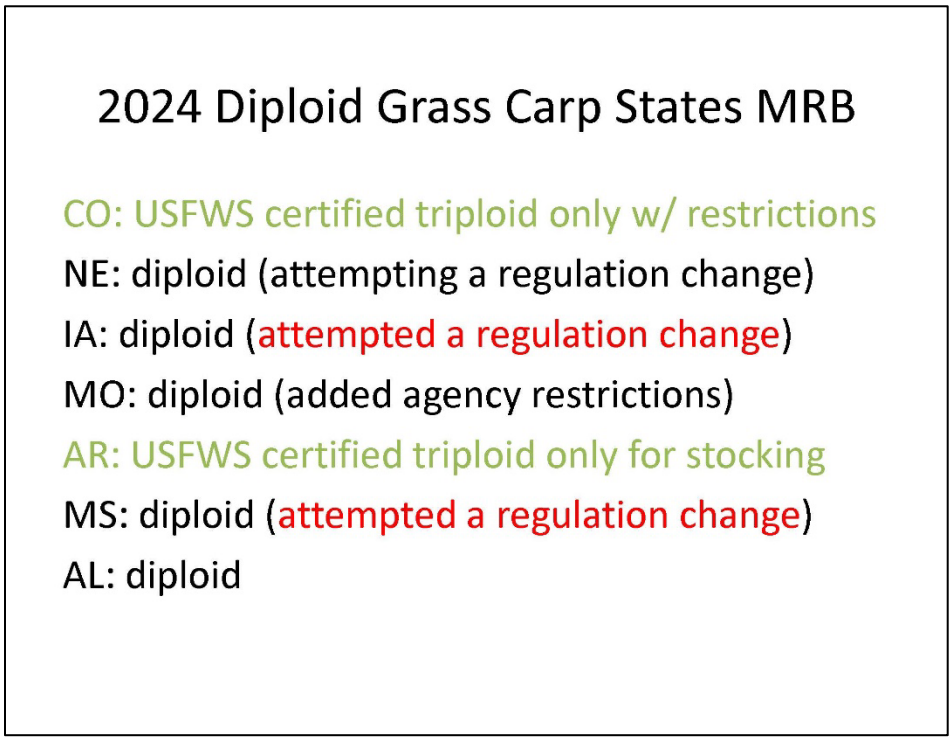
22) Mississippi River Basin Panel on AIS Update

Information:

Rob Bourgeois, LDWF, will provide the Executive Board with an update on the Mississippi River Basin Panel. A written report that was provided for the ANS Task Force meeting January 24-25, 2024, is provided below.

The MRBP received a letter from the Great Lakes Panel, provided below, requesting "assistance in addressing the threat of naturally reproducing and self-sustaining populations of grass carp, *Ctenopharyngodon idella*, to our nation's waterways and freshwater fisheries." A similar letter was sent to each of the ANS Task Force Regional Advisory Panels, and a discussion of the letter was planned for the January 2024 ANS Task Force meeting.

The MRBP shared the Great Lakes Panel letter and a draft response letter with the MICRA delegates that allow stocking of diploid grass carp and requested information from the delegates "to make sure the member agencies' perspectives are fairly and accurately represented in the correspondence with GLP and during discussions at the ANS Task Force meeting." A copy of the email to the diploid state delegates and the response provided to the Great Lakes Panel are also provided below. Responses were received from five of the six states and are summarized below. An overview of the discussion at the ANS Task Force meeting will be provided to the Executive Board.



Mississippi River Basin Panel (MRBP) Update to the ANS Task Force January 16, 2024

MRBP Coordination Meetings

- The MRBP held a hybrid all-panel coordination meeting at Barr Lake State Park in Brighton, Colorado from July 26-28, 2023. The meeting was hosted by Colorado Parks and Wildlife. There were forty-four attendees during the three-day event that had presentations on the bait pathway, priority pathogens, fish health management, horizon scanning, risk assessments, organisms in trade, and invasive carp management. MRBP committees held meetings in conjunction with the event and participants toured a watercraft inspection and decontamination station.

- The next meeting of the MRBP will be hosted by the Arkansas Fish and Game Department in Little Rock, Arkansas from April 9-11, 2024.

Recent MRBP Accomplishments

- The Mississippi River Basin Panel on Aquatic Invasive Species officially changed their name from the former Aquatic Nuisance Species. A logo revision and rebranding project is underway with a website redesign anticipated in the future.

- The MRBP held three elections in the past year and welcomed Patrick Kroboth, USGS, as the new Research and Risk Assessment Committee Chair; Rob Bourgeois, LA-DWF, as the new MICRA AIS Committee Chair and MRBP Liaison; and Amy Kretlow, WI-DNR, as the new First Term Co-Chair.

- The Prevention and Control Committee surveyed members and compiled a list of priority invasive pathogens that have the potential to be spread through the bait pathway.

    - Over the next year, the Education and Outreach Committee will examine current educational resources on these pathogens and determine needs for potential future project work. Similarly, the Research and Risk Assessment Committee will conduct a needs assessment to identify research gaps that may be considered for future MRBP project work.

    - The MRBP has compiled a list of Fish Health Experts at the federal and state level in hopes of fostering collaborative efforts that will ultimately help to reduce the spread of invasive pathogens through the aquatic bait pathway.

- The Prevention and Control Committee examined State ANS Plans within the MRBP and compared the plans' priority species lists in preparation for revising the MRBP's Most Troublesome AIS List (2003).

- The Prevention and Control Committee surveyed members and compiled a spreadsheet of state regulated invasive species that are also on the federal injurious wildlife list to

inform the revision of the MRBP's Most Troublesome AIS List and to contribute to conversations regarding the Lacey Act.

- The Prevention and Control Committee surveyed members and updated a compilation of state regulations on each invasive carp species to aid in interjurisdictional invasive carp management efforts.
- The Research and Risk Assessment Committee updated contact information on the black carp identification and reporting guide "Keep, Cool, Call."
- The Research and Risk Assessment Committee developed an informational fact sheet summarizing the MRBP's Tributary Data Project with Southern Illinois University, which was conducted from 2021-2022. The fact sheet was distributed through the MRBP and American Fisheries Society chapters.
    - The MRBP coordinated the collection of water samples from across the Mississippi River Basin during the 2021 field season for an assessment of water chemistry (strontium, barium, calcium, magnesium, and manganese concentrations and stable oxygen isotope ratio) of main-stem rivers and tributaries in the Basin, focusing on rivers where limited or no water chemistry data are available. Analyses of otolith stable isotopes and elemental compositions can provide insights regarding environmental history of individual fish in a variety of environments, and are particularly useful for identifying environments used by fishes during early life stages. The water chemistry data needed for these analyses were missing or incomplete in many parts of the Basin. This project was designed to fill in these knowledge gaps, which will benefit ANS and fisheries management for all MRBP members.
    - The project produced a data set of water chemistry data for the Mississippi River Basin that can be used to inform otolith microchemistry studies on invasive fishes. All data generated by this project is archived with the Southern Illinois University data and publications repository. The data is open source and may now be accessed by anyone.
- The Research and Risk Assessment Committee provided contract support and management for a multi-year MRBP agreement with the University of Nebraska Omaha to conduct and complete a silver carp genetics project titled, "Identifying Target Spawning Populations through Genomic Analysis for Directed Management". This project has just completed and the final report will be presented at the April 2024 MRBP Meeting in Arkansas.
- The Education and Outreach Committee is considering hosting a Community Based Social Marketing (CBSM) Workshop with Doug McKenzie-Mohr in 2024. The MRBP is open to partnering with other Panels on the workshop if there is interest.

[EXTERNAL] Regional panel discussion and coordination regarding Grass Carp with MRBP

Fischer, Eric D <EFischer@dnr.IN.gov>

Fri 6/30/2023 1:51 PM

To:Andrew.Stump@ky.gov <Andrew.Stump@ky.gov>;Cole R. Harty <cole.r.harty@tn.gov>;Conover, Greg <greg_conover@fws.gov>
Cc:Cecilia Weibert <cweibert@glc.org>

1 attachments (122 KB)
MRBP Diploid Grass Carp letter-6.30.23.docx;

Good afternoon,

I am writing on behalf of the Great Lakes Panel on Aquatic Nuisance Species (GLP) to request your assistance in addressing the threat of naturally reproducing and self-sustaining populations of grass carp, *Ctenopharyngodon idella*, to our nation's waterways and freshwater fisheries. The GLP would like to work with the other regional panels to understand their members' level of concern about this species and advocate for prohibition of the stocking of diploid grass carp. The GLP took steps in 2019 to work with the Council of Great Lakes Fisheries Agencies to advocate for the prohibition of introduction and stocking of diploid grass carp in the six U.S. states where it remained legal. Since that time, several states have made the decision to no longer stock or use diploid grass carp in their own work, but none have successfully passed legislation preventing the movement or stocking of diploid grass carp within the waters of the state. Our goal in sending these letters to each regional ANS panel is to open a dialogue, from panel to panel, to gain a better sense of understanding on the members' opinions and priorities about this issue, and identify areas where it makes sense to work together to push the issue forward.

Our letter contains additional context about this request, including five specific questions that we are seeking your feedback on. As noted in the letter, we are happy to discuss these questions together via a virtual meeting, or to receive written responses – whatever your communication preference is, we are open to any dialogue. I look forward to your response and continuing our panels' work to protect our water from the negative impacts of AIS.

Respectfully,

Eric Fischer
Current Chair of the GLP panel
Indiana Aquatic Invasive Species Coordinator
402 W. Washington Street, Room W-273
Indianapolis, Indiana 46204
317-234-3883 efischer@dnr.IN.gov

Great Lakes Panel
ANS
on Aquatic Nuisance Species

1300 Victors Way, Suite 1350
Ann Arbor, MI 48108-5203
Phone: 734-971-9135
glc.org/work/glpans

Chair: Eric Fischer, Indiana Department of Natural Resources
Vice Chair: Kelly Pennington, Minnesota Department of Natural Resources

June 30, 2023

Dear Andrew Stump, Cole Harty, and Greg Conover,

I am writing on behalf of the Great Lakes Panel on Aquatic Nuisance Species (GLP) to request your assistance in addressing the threat of naturally reproducing and self-sustaining populations of grass carp, *Ctenopharyngodon idella*, to our nation's waterways and freshwater fisheries. The GLP would like to work with the other regional panels to understand their members' level of concern about this species and advocate for prohibition of the stocking of diploid grass carp. This non-native species has been an important tool for aquatic vegetation control since the 1960s. Grass carp are highly specialized feeders that, in high densities, often consume all aquatic vegetation in a system, which in turn has direct and indirect effects on aquatic communities and water quality (e.g., Dibble and Kovalenko 2009). Recently, natural reproduction of grass carp has been documented in the Great Lakes (Embke et al. 2016), the Colorado River Basin (Brandenburg et al. 2019), and tributaries to Truman Reservoir (Hayer et al. 2021). Grass carp are also reproducing in the Trinity River in Texas and throughout the lower and middle Mississippi River and its larger tributaries. Self-sustaining populations of grass carp have the potential to damage valuable natural resources both within and beyond the jurisdictions that constitute the Mississippi River Basin Panel on Aquatic Nuisance Species (MRBP). Their reproduction in tributaries to the Great Lakes is creating international concern about the production, shipment, and stocking of *diploid* grass carp in the U.S. Thus, many states and partner groups are advocating for a consistent, national policy that permits only the stocking of certified sterile triploid grass carp.

The GLP would like to work with the MRBP and the other regional ANS panels to assess the level of concern about the stocking, spread, reproduction of established populations, and impacts of diploid grass carp in your jurisdictions. As of the writing of this letter, stocking of diploid grass carp remains legal in Alabama, Arkansas, Iowa, Mississippi, Missouri, and Nebraska.

As recorded in the U.S. Geological Survey's Nonindigenous Aquatic Species database (USGS-NAS, https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=2947), diploid grass carp have been stocked historically in MRBP jurisdictions. Diploid grass carp also have been captured in areas where they have not been stocked, indicating evidence of spread or illegal stocking. There is also natural reproduction in several waterbodies in member states of the MRBP.

As a response to this threat, and the threat posed by bighead carp, black carp, and silver carp, federal and state agencies are spending approximately $40 million annually to prevent their introduction, establishment, and spread. This includes spending to develop efficient, targeted tools and techniques to reduce the abundance of wild invasive grass carp.

There are several reasons to support the sale and use of triploid grass carp over diploid. It's widely recognized that the use of functionally sterile, triploid grass carp is an environmentally safer alternative to diploid grass carp by significantly reducing the risk of self-sustaining populations and negative ecological impacts. Although initially more expensive to procure at wholesale than diploid fish, farm owners can recover the additional cost of purchasing triploid grass carp in the retail price to consumers. The cost to produce and purchase triploid grass carp is substantially less than the cost of chemical control of aquatic vegetation and eliminates risks caused by using toxic herbicides. In addition, the useful life of triploid grass carp for providing vegetation control is marketed at two years more than diploid carp, resulting in a lower overall cost to consumers.

Reproduction of grass carp in the upper Colorado River Basin underscores the threat of stocking diploid grass carp. Recovery of the *Gila* spp. chubs and Razorback Sucker *Xyrauchen texanus* are threatened by destruction of seasonal wetlands required by early life stages of these native and endangered species. We believe that there are many water bodies, including upstream tributaries, still uninvaded by diploid grass carp in the WRP jurisdictions and that WRP members have a strong desire to protect those water bodies and the ecosystems and recreational opportunities that they support. Despite evidence of spread and reproduction, taking actions to prevent any future introductions is a tangible way to limit additional spread, establishment, and reproduction of new populations.

The GLP would like to work with MRBP and the other four regional ANS panels to address this issue collaboratively. To that end, we would like to know:

- What is the MRBP membership's level of concern about naturally reproducing and self-sustaining populations of grass carp?
- Are MRBP members aware of any established/reproducing populations within MRBP jurisdictions that are not currently recorded in the USGS-NAS database?
- Are you willing to engage state agencies on researching whether there are naturally reproducing or self-sustaining populations of grass carp in MRBP jurisdictions?
- What is the MRBP membership's level of concern about permitting stocking diploid grass carp for vegetation control?
- What are the MRBP membership's opinions about replacing the stocking of diploid grass carp with stocking of triploid grass carp?

Based on the responses that we receive from each regional ANS panel, there may be an opportunity to work together to provide an update to the Aquatic Nuisance Species Task Force on a joint recommendation provided by the GLP and the Mississippi River Basin Panel on Aquatic Nuisance Species in 2015, or to submit a new joint recommendation based on the interest of other regional ANS panels.

Respectfully,

Eric Fischer
Current Chair of the GLP panel
Indiana Aquatic Invasive Species Coordinator
402 W. Washington Street, Room W-273
Indianapolis, Indiana 46204
317-234-3883 efischer@dnr.IN.gov

References

Brandenburg, W.H., T.A. Francis, D.E. Snyder, K.R. Bestgen, B.A. Hines, W.D. Wilson, S. Bohn, A.S. Harrison, S.L. Clark Barkalow. 2019. Discovery of Grass Carp Larvae in the Colorado River Arm of Lake Powell. North American Journal of Fisheries Management 39:166-171.

Dibble, E.D., and K. Kovalenko. 2009. Ecological impact of Grass Carp: a review of the available data. Journal of Aquatic Plant Management 47:1-15.

Embke, H.S., P.M. Kočovský, C.A. Richter, J.J. Pritt, C.M. Mayer, and S.S. Qian. 2016. First direct confirmation of grass carp spawning in a Great Lakes tributary. Journal of Great Lakes Research 42:899-903.

Hayer, C.-A., M.A. Bayless, C.A. Richter, A.E. George, and D.C. Chapman. 2021. Grass Carp reproduction in small tributaries of Harry S. Truman Reservoir, Missouri: implications for establishment in novel habitats. North American Journal of Fisheries Management 43:154-163.

Response requested: diploid grass carp letters and ANS Task Force discussion

Conover, Greg <greg_conover@fws.gov>

Thu 11/30/2023 9:43 AM

To:Greene, Chris <Chris.Greene@dcnr.alabama.gov>;Benjamin Batten <ben.batten@agfc.ar.gov>;Joe Larscheid <Joe.Larscheid@dnr.iowa.gov>;Jerry Brown <Jerry.Brown@wfp.ms.gov>;Bruce Drecktrah <Bruce.Drecktrah@mdc.mo.gov>;Dean Rosenthal <dean.rosenthal@nebraska.gov>
Cc:amy.kretlow <amy.kretlow@wisconsin.gov>;Rob Bourgeois <rbourgeois@wlf.la.gov>;MICRA <micra@micrarivers.org>

3 attachments (1 MB)

MRBP Diploid Grass Carp letter-6.30.23.docx; MRBP Diploid Grass Carp GLP Letter Response 12.2023.docx; MICRA Grass Carp report to USFWS final no appendices.pdf;

MICRA Delegates,
My apologies up front for the length of this email. Four specific requests are listed in **bold** below. The Mississippi River Basin Panel (MRBP) on AIS received the attached letter from the Great Lakes Panel (GLP) on ANS referencing natural reproduction of grass carp in the Colorado River Basin, Trinity River in Texas, tributaries of Truman Reservoir, and the Great Lakes as cause for "international concern about the production, shipment, and stocking of *diploid* grass carp in the U.S." that has resulted in "many states and partner groups are advocating for a consistent, national policy that permits only the stocking of certified sterile triploid grass carp." The GLP specifically identifies Alabama, Arkansas, Iowa, Mississippi, Missouri, and Nebraska as states in the Mississippi River Basin where stocking of diploid grass carp remains legal. (The only other state in the nation that allows stocking of diploid grass carp is Hawaii.) The GLP goes on to request the MRBP's assistance 1) understanding our member agencies' level of concern about the stocking, spread, reproduction of established populations, and impacts of diploid grass carp in your jurisdictions, and 2) in advocating for prohibition of the stocking of diploid grass carp. Similar letters were sent to all six regional advisory panels to the ANS Task Force.

The MRBP Executive Committee has drafted the attached response letter to the GLP and this topic will be discussed at the ANS Task Force meeting in January. MICRA and the MRBP have both been on record for more than a decade expressing concern about the risk of unintentional and illegal introductions of diploid and triploid Grass Carp in the U.S. and advocating for a consistent, national policy that permits only the stocking of certified sterile triploid grass carp. Amy Kretlow (WI), Rob Bourgeois (LA), and I will be attending the ANS Task Force meeting in January representing MICRA and the MRBP. We, and the MRBP Executive Committee, want to make sure the member agencies' perspectives are fairly and accurately represented in the correspondence with GLP and during discussions at the ANS Task Force meeting.

1. **Please let us know if you have any concerns regarding the draft MRBP letter by next Friday, December 8, so they can be discussed on our MRBP Executive Committee call the following Monday.**
2. **If applicable, please advise on changes to your state's regulations to prohibit the use of diploid grass carp and/or require only the stocking of certified triploid grass carp so that we can provide accurate information.**
3. **In response to the GLP's request, please let us know if you would like a different perspective from those of MICRA and the MRBP to be communicated regarding your agency's level of concern about stocking, spread, reproduction of established populations, and impacts of diploid grass carp.**
4. **Similarly, please let us know if you would like to provide any perspective, information, or discuss this topic with us as we prepare for the discussion at the ANSTF meeting in January.**

For those that aren't aware, the USFWS funded MICRA to complete a proposed 'National Analysis of Grass Carp Regulation, Production, Triploid Certification, Shipping, and Stocking' (National Analysis) in June 2012. MICRA sub-contracted HDR Engineering, Inc. to complete the independent National Analysis of the Grass Carp industry in the U.S. and to provide recommendations to prevent unintentional and unintentional and illegal introductions of diploid and triploid Grass Carp. Attached is the project report that MICRA submitted to the USFWS. (The Executive

Summary is a quick read at a little more than 2 pages.) Based on the results of the National Analysis, recommendations provided by HDR, and comments received from USFWS, state, and Grass Carp industry representatives, MICRA developed a set of eight minimum recommendations for a consistent national policy strategy for Grass Carp to minimize the risk of unintentional and illegal introductions of diploid and triploid Grass Carp in the U.S. The MRBP worked closely with the MICRA Executive Board in managing this project and developing the report. The MRBP also has kept implementation of the report recommendations on the panel's work plan.

Thank you!
Greg

Greg Conover
MICRA Coordinator
Large Rivers Coordination Office
292 San Diego Road
Carbondale, IL 62901
618-889-9600 (cell)
618-997-9185 (fax)

The MISSISSIPPI RIVER BASIN PANEL On AQUATIC INVASIVE SPECIES
292 San Diego Rd
Carbondale, IL 62901
www.MRBP.org

December 18, 2023

Dear Mr. Eric Fischer,

On behalf of the Mississippi River Basin Panel (MRBP) on Aquatic Invasive Species (AIS), we appreciate the Great Lake Panel (GLP) letter dated June 30, 2023, requesting assistance in addressing the threat of naturally reproducing and self-sustaining populations of grass carp, *Ctenopharyngodon idella*, to our nation's waterways and freshwater fisheries. The MRBP agrees that there is a need to work collaboratively across regional panels to advance a national policy that aligns state and federal authority to further the prohibition of stocking diploid grass carp and consistent, uniform regulations that allow stocking of only USFWS certified triploid grass carp.

The MRBP has recently updated a shared document that describes member states' invasive carp regulations. This document is intended to inform the national conversation related to grass carp and other invasive carp species. Given the MRBP's geographic overlap with other panels, this document includes all the Great Lakes Panel states, except Michigan, and several Western Regional Panel and GSARP states. The MRBP offers to expand this resource to include additional states.

The Mississippi Interstate Cooperative Resource Association (MICRA) developed a report for the U.S. Fish and Wildlife Service in 2015 titled "The use of grass carp (*Ctenopharyngodon idella*) in the United States: production, triploid certification, shipping, regulation, and stocking recommendations for reducing spread throughout the United States". The first five recommendations address state regulatory improvements and the need to provide a consistent national policy and strategy for grass carp. The remaining recommendations are intended to improve the efficacy of the USFWS National Triploid Grass Carp Inspection and Certification Program and to address education and outreach needs. The MRBP recommends this report be used as a framework to inform and advance cross-boundary collaboration.

The MRBP is concerned about the stocking, spread, reproduction of established populations, and impacts of diploid grass carp within the basin and across the nation. As such, we have referred this topic, and specifically your request for the panels to work collaboratively, to the ANS Task Force for discussion at their upcoming meeting in January. It is our understanding that invasive grass carp is now an agenda item at that meeting. We look forward to engaging with the GLP and other regional panels through the ANS Task Force. The MRBP Executive Committee will revisit this topic following that discussion.

Respectfully,

Cole Harty

Cole Harty, Second-Term Co-Chair of the MRBP
292 San Diego Road
Carbondale, Illinois 62901
mrbp@micrarivers.org - www.mrbp.org
cc: Susan Pasko, ANS Task Force Executive Secretary

23) Aquatic Invasive Species Committee Update

Information:

Rob Bourgeois, LDWF, will provide the Executive Board with an update on the Aquatic Invasive Species Committee. The committee has been working to develop a new template for state fact sheets. The template is provided below and will be discussed with the Executive Board. The template, created as a fillable .PDF, is two-sided. One side is about AIS, the other side is about interjurisdictional fisheries management.

AQUATIC INVASIVE SPECIES (AIS)

A problem for ALL Louisiana residents

ONCE CONSIDERED AN ISSUE FOR NATURAL RESOURCE MANAGERS ONLY, AIS HAVE BECOME A PROBLEM FOR ALL CITIZENS.

Aquatic invasive species are non-native species that are a major problem in the U.S. and represent a threat to the environment, as well as a threat to water suppliers, industry, power generation, recreation, and ultimately, the U.S. economy.

MAJOR AIS ISSUES IN LOUISIANA INCLUDE

Reproducing populations of invasive carp are expanding in both range and numbers within the major rivers of the state impacting fisheries production and recreation.

- Apple Snails are increasing their range and disrupting food chains.

- Giant Salvinia, Water Hyacinth and other invasive plants are impacting boating and other recreation and modifying aquatic habitat.

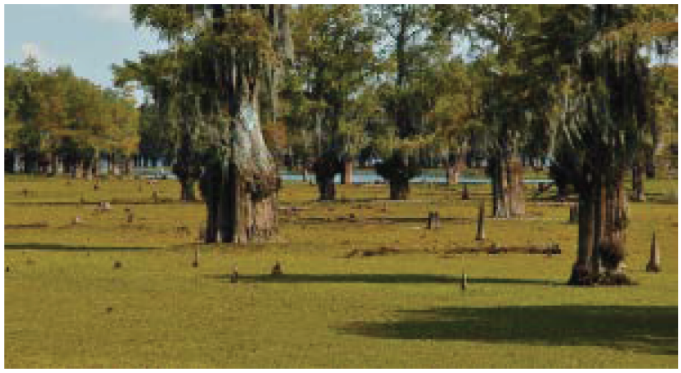
HOW IS LOUISIANA ADDRESSING AIS?

- Collaborating with other states to implement the Lower Mississippi River Invasive Carp Control Strategy Framework.

- Treatment of 32,000 acres of invasive aquatic vegetation including 19,000 acres for Giant Salvinia and 9,000 acres of Water Hyacinth.

- Developing prohibited list of species to slow down the next invasive species.

- Supporting the call for a Mississippi River Basin Fishery Commission witha dedicated funding source to provide increased collaboration among the 31 state management agencies, and their federal and tribal partners, for the effective management of shared fishery resources, including AIS, throughout the Basin.



MORE INFORMATION

Robert Bourgeois
Aquatic Invasives Species Coordinator
Louisiana Dept. of Wildlife and Fisheries
225-765-0765 | rbourgeois@wlf.la.gov

NATIVE FRESHWATER FISHERIES

INTERJURISDICTIONAL (IJ) FISHERIES MANAGEMENT

THERE ARE MORE THAN 90 FISH SPECIES AND 150 RIVERS IN THE MISSISSIPPI RIVER THAT COME UNDER INTERJURISDICTIONAL MANAGEMENT

"Interjurisdictional fish" are fish species that move either short or long distances between political jurisdictions in the completion of their life cycles, and therefore, come under the management of two or more governmental entities.

MAJOR IJ FISHERIES IN LOUISIANA INCLUDE

Reproducing populations of invasive carp are expanding in both range and numbers within the major rivers of the state impacting fisheries production and recreation.

- Apple Snails are increasing their range and disrupting food chains.

- Giant Salvinia, Water Hyacinth and other invasive plants are impacting boating and other recreation and modifying aquatic habitat.

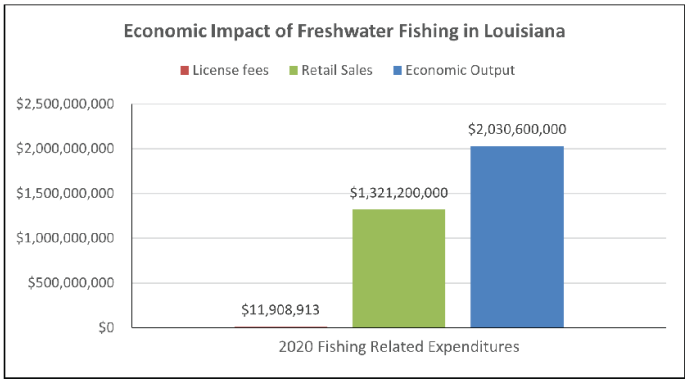
IJ FISHERIES MANAGEMENT IN LA

- Collaborating with other states to implement the Lower Mississippi River Invasive Carp Control Strategy Framework.

- Treatment of 32,000 acres of invasive aquatic vegetation including 19,000 acres for Giant Salvinia and 9,000 acres of Water Hyacinth.

- Developing prohibited list of species to slow down the next invasive species.

- Supporting the call for a Mississippi River Basin Fishery Commission witha dedicated funding source to provide increased collaboration among the 31 state management agencies, and their federal and tribal partners, for the effective management of shared fishery resources, including AIS, throughout the Basin.



MORE INFORMATION

Robert Bourgeois
Aquatic Invasives Species Coordinator
Louisiana Dept. of Wildlife and Fisheries
225-765-0765 | rbourgeois@wlf.la.gov

24) Webpage Dashboard Demonstration

Discussion:

At the Executive Board's August 2023 meeting, Rebecca Neeley and Ross Ruehmann, USFWS La Crosse Fish and Wildlife Conservation Office, provided a demonstration on how a dashboard could be developed for the MICRA website to get information out to the public or as needed by MICRA. The board was interested in further developing the demonstration dashboard into a base tool that could be added to the MICRA website and shared with the MICRA committees and delegates to identify future needs and additional data layers that could potentially be built into the dashboard to meet their needs. The initial layers discussed for the base dashboard include the MICRA sub-basin management units, USGS HUCs, Congressional districts, MICRA's list of 6th order and larger interjurisdictional rivers. Two potential next steps were identified by the Executive Board: 1) information that would be useful for MICRA's DC fly-in in March, and 2) using the dashboard to visualize and report out on how USFWS invasive carp funding is being used throughout the basin. The following two action items resulted from the discussion.

- The Executive Board will consider what a few top priority communications needs or maps might look like and the data layers that would be needed to develop them.
- Rebecca Neeley will determine the possibility of the La Crosse FWCO developing a web-based dashboard tool for MICRA that includes MICRA sub-basin group boundaries, congressional districts, MICRA's 6th order and larger streams, and the characterization of relative abundance of bigheaded carps similar to the figure included in the USFWS-led Report to Congress.

Neeley and Ruehmann will provide an update on progress developing the base dashboard for the MICRA website.

25) Mississippi River Basin Fishery Commission Next Steps

Discussion:

The Executive Board will continue the on-going discussion to prepare for operationalizing the proposed Mississippi River Basin Fishery Commission. In February 2023, the Executive Board identified the following three topics to revisit:

1. Does the board need to start putting together a rough budget on the initial administrative and operational needs, i.e., how will the $1 million in appropriations be used?
2. Is more discussion needed regarding a request to AFWA or seeking a contractor to continue these planning discussions?
3. What are our next steps?

In August 2023, the board discussed this topic before, during, and after the All-Delegate meeting. Key points from the board's August 2023 discussions are provided below.

Prior to All-Delegate Meeting

- There was agreement that the Executive Board does not need to have a plan completely lined out, but that it would be in the board's best interest to be able to communicate within $100,000 what the commission will do with the initial $1 million in appropriations and to have a rough idea of what the transition and timeframe look like once the commission is authorized.
- The initial step would be to hire an executive director. The board discussed keeping staff minimal but adding key positions such as an administrative assistant/grant specialist, a communications director that could also serve as a deputy director or director in training if needed, and a staff biologist.
- Each state agency in attendance addressed their ability and challenges to use proposed Commission funding to add capacity for large rivers interjurisdictional fisheries management.
    - Is there a nuance that needs to be made to the invasive carp funding or the commission funding if it comes to fruition to make it more like the state/interstate ANS management plan funding? That funding must be appropriated annually, but many states have used that funding to justify adding an AIS coordinator position to their staff. Are these funds considered more reliable or viewed differently from the invasive carp funds?

- There is no match requirement in the commission legislation. That will make a big difference for several states.
- The purpose of the commission is added resources and capacity for interjurisdictional fisheries management. If the agencies are running into position caps, is there something that MICRA can do to inform the Directors and help support requests for increased position caps to support the commission? Is there a different mechanism that we have not discussed to allow you to get the work done?
- Could the commission provide the additional capacity for the states rather than providing funding? That could get complicated from the commission's standpoint. Some directors are challenging their staff to get more done without adding to their position counts. Are you proposing that a commission employee would be hired and paid by the commission but stationed within a state agency to support interjurisdictional fisheries work? Yes, they could be essentially assigned as agency staff.
- There would be a considerable administrative burden on the commission if there is wide interest in hiring commission staff positions that are then assigned to work for the states. Payroll, benefits, human resources, etc. would all fall to the responsibility of the commission. There are considerations with the number of employees that we will need to be aware of.
- We previously discussed the need for some contract support for legal and accounting needs in addition to the four initial positions for the commission. Those contract needs will be much higher if the commission is hiring additional staff to work for the states.

<u>All-Delegate Meeting</u>

- Each state's "Fish Chief" (or equivalent) would serve as the delegate to the commission. This would be consistent with the existing MICRA membership and the Great Lakes Fishery Commission's Council of Mississippi River Fishery Agencies. The existing MICRA Executive Board structure would be used for establishing the actual Commissioners. As proposed, the Commissioners would be identified by the member agencies and not be political appointments.
- The governance, rules, and procedures are intentionally not specified in the draft legislation. Developing the governance documents will be critical first steps during the first year. It will be important to hire an Executive Directly quickly. There may be a period of time between the authorization of the commission and initial appropriations to support the commission.

- The intent of the non-competitive funding is to enable the state agency commission members to increase their capacity for commission and interjurisdictional fisheries management related work. The board is interested in learning the states' ability and interest to add staff to participate in the commission and work on large river interjurisdictional fisheries management if they were to receive non-competitive grant funding each year through the commission (e.g., $100,000 or $250,000).
    - Batten summarized that the consensus appears to be that although it would take time, it sounds like most agencies have options to pursue. It was brought up that HR departments are another consideration in how long it may take to fill these positions, whether new or repurposed. It may be necessary to contract out initially while the agencies work through their internal processes.

<u>After All-Delegate Meeting</u>

- There will be several things for MICRA to begin preparing immediately, e.g., initial charter documents, rules and procedures, the official document used for states to join the commission, elect and convene the governing council, etc.
- There is some legwork that could be done to research the transition. Someone could start by contacting each of the existing commissions to discuss their governance documents. A state agency would likely hire an attorney to work on something like this. Smith could potentially assist with this once the legislation is passed. She knows a lawyer with the right experience and background that MICRA could reach out to.
- What can we start working on now rather than scrambling once the authorizing bill is passed? It would be good to start holding regular calls focused on the transition. The board might want to consider a transition team sub-committee, but who would be able to participate?

26) USFWS Economic Value Report Update

Discussion:

Conover will provide an update on his discussion with Jim Caudill, USFWS Division of Economics, regarding the development of a new economic value report for the Mississippi River Basin.

27) MICRA's 2024-2028 Priorities Document

Decision:

The Executive Board members approved updates to the 2024-2028 priorities document and 2019-2023 accomplishment tracking in December 2023. A few comments and suggested editorial revisions were proposed to the document. Two accomplishments were revised to reflect that the actions are on-going and are expected to be completed in early 2024. An updated document with the suggested edits and revisions indicated with track changes is provided in Appendix 4. The Executive Board will be asked to approve the document for posting on MICRA website and sharing with the delegates.

28) MICRA's Aquatic Habitat Action Plan

Discussion:

Conover will discuss changes to the updated list of interjurisdictional rivers to add the ceded territories and 6th order and larger rivers with a federal nexus. Updated sub-basin tables are provided below. Updated maps are included in the draft Aquatic Habitat Action Plan in Appendix 5. The Executive Board will discuss remaining steps to finalize the Aquatic Habitat Action Plan.

Navigable Waterway Network

Arkansas-Red-White Rivers Sub-basin – 6th order and larger interjurisdictional rivers

Rivers	Stream Order	States	Tribal	Federal
White	8	AR, MO		x
North Fork	6	MO, AR		x
Black	7	MO, AR		x
Current	6	AR, MO		x
Spring	6	MO, AR		
Eleven Point	6	MO, AR		x
Arkansas	9	CO, KS, OK, AR	x	x
Salt Fork Arkansas	7	OK, KS	x	x
Medicine Lodge	6	OK, KS		
Chikaskia	6	OK, KS	x	
Cimarron	6	OK, KS, CO	x	x
Verdigris	7	KS, OK	x	x
Caney	6	OK, KS	x	
Little Caney	6	OK, KS	x	
Neosho	7	OK, KS	x	x
Spring	6	MO, KS, OK	x	
Illinois	6	AR, OK	x	x
Canadian	8	OK, TX, NM	x	x
North Canadian**	7	OK	x	x
Beaver	6	OK, TX	x	x
Poteau	6	AR, OK	x	x
Red	7	LA, AR, OK, TX	x	x
North Fork Red River	6	OK, TX		x
Washita	6	OK, TX		x
Muddy Boggy Creek**	6	OK		
Kiamichi**	6	OK		x
Little	6	OK, AR		x
Mountain Fork	6	OK, AR		x
Sulphur	6	AR, TX		x
Twelve Mile Bayou*	6	LA		x
Big Cypress	6	TX, LA		x
Loggy Bayou*	6	LA		
Bayou Dorcheat	6	AR, LA		

Green text are additions to MICRA list.

* Loggy Bayou is not an interjurisdictional river but is formed by IJ tributaries.

~~** North Canadian, Muddy Boggy Creek, and Kiamichi flow through or border tribal lands.~~

Navigable Waterways

1. San Bois Creek (OK, Arkansas trib in Robert Kerr Reservoir): stream order?
2. Cypress B'you (TX and LA, Red River trib): stream order?

Lower Mississippi River Sub-basin – 6th order and larger interjurisdictional rivers

Rivers	Stream Order	States	Tribal	Federal
Mississippi	**10**	**MS, LA, TN, AR, MO, KY**		x
Ohio	9	OH, PA, WV, KY, IN, IL		x
Obion	7	TN		x
Hatchie	6	TN, MS		
St. Francis	7	AR, MO		x
(Right Hand Chute) Little River[3]	6	MO, AR		x
White	8	AR, MO		x
Arkansas	9	AR, KS, CO, OK		x
Yazoo	7	MS, LA		x
Red	8	TX, OK, AR, LA		x
Black[1]	7	LA		x
Little River	6	LA		x
Tensas	6	LA		x
Ouachita	7	LA, AR		x
Bayou Bartholomew	6	LA, AR		
Boeuf	6	LA, AR		
~~Amite~~	~~7~~	~~MS, LA~~		
Atchafalaya[2]	8	LA		x

Green text are additions to MICRA list.

Navigable Waterway Network

1. Obion
2. Tensas
3. Little River

NOTES:

[1] ~~The Black River is not an interjurisdictional river but is formed by interjurisdictional tributaries.~~

[2] The Atchafalaya River is a distributary river formed by the Mississippi and Red Rivers.

[3] Are these two different rivers? If so, are both IJ?

Missouri River Sub-basin – 6th order and larger interjurisdictional rivers

Rivers	Stream Order	States	Tribal	Federal
Missouri	9	MO, NE, SD, ND, MT, IA, KS	x	x
Madison	6	WY, MT		x
Gallatin	6	WY, MT		x
Milk[2]	6	MT, AB[3], SK[3]	X	x
Marias[2]	6	MT, SK[3]	X	x
Yellowstone	8	WY, MT, ND		x
Clarks Fork	6	WY, MT		x
Bighorn[2]	7	MT, WY	X	x
Wind[2]	7	WY	X	
Tongue[2]	6	MT, WY	X	x
Powder	6	MT, WY		x
Little Missouri	6	SD, ND, WY, MT	X	x
Grand[1]	6	SD		x
North Fork Grand	6	ND, SD		x
Moreau[2]	6	SD	X	
Cheyenne	7	WY, SD		x
Belle Fourche	6	WY, SD		x
White	6	SD, NE	X	x
Niobrara	6	WY, NE		x
James	7	ND, SD		x
Big Sioux	7	SD, IA		
Rock	6	MN, IA		
Little Sioux	6	IA, MN		x
Platte[1]	8	NE		
South Platte	7	NE, CO		x
Laramie	6	WY, CO		x
North Platte	7	NE, WY, CO		x
Nishnabotna	6	IA, MO, NE		
Kansas[1]	8	KS		x
Smoky Hill	7	CO, KS		x
Republican	7	NE, KS		x
Beaver Creek	6	WY, SD		x
Big Blue	7	NE, KS		x
Little Blue	6	NE, KS		
Grand	7	IA, MO		x
Thompson	6	IA, MO		
Osage[1]	7	MO		x
Marais des Cygne	6	KS, MO		x
Gasconade	6	MO		x

Green text are additions to MICRA list.

Navigable Waterway Network

1. Gasconade
2. Osage

Notes:

[1] The ~~Grand (SD)~~, Platte, ~~Kansas, and Osage~~ rivers are not interjurisdictional rivers but are formed by interjurisdictional tributaries.

[2] The Milk, Marias, Bighorn, Wind, Tongue, and Moreau rivers flow through or border tribal lands.

[3] AB = Alberta Canada, SK = Saskatchewan

Ohio River Sub-basin – 6th order and larger interjurisdictional rivers

Rivers	Stream Order	States	Tribal	Federal
Ohio	9	OH, PA, WV, KY, IN, IL		x
Allegheny	8	NY, PA		x
Monongahela	7	PA, WV		x
Cheat	6	WV, PA		x
Youghiogheny	6	PA, MD		x
Beaver[1]	7	PA		
Mahoning	6	OH, PA		
Little Beaver Creek	6	OH, PA		
Muskingum	7	OH		x
Little Kanawha	6	WV		x
Kanawha[1]	6	WV		x
New	6	WV, VA, NC		x
Big Sandy	7	WV, KY		x
Tug Fork	6	KY, WV, VA		x
Levisa Fork	6	VA, KY		x
Russell Fork	6	KY, VA		x
Licking	6	KY		x
Kentucky	6	KY		x
Green (and Barren)	7 (6)	KY		x
Wabash	6	IN, IL, OH		x
Vermillion	6	IL, IN		
Tradewater	6	KY		x
Cumberland	7	KY, TN		x
Tennessee	8	KY, TN, MS, AL		x

Green text are additions to MICRA list.

Navigable Waterway Network

1. Tradewater
2. Green (and Barren)
3. Kentucky
4. Licking
5. Little Kanawha
6. Muskingum

Notes:

[1] The Beaver ~~and Kanawha~~ rivers are not interjurisdictional rivers but are formed by interjurisdictional tributaries.

Tennessee and Cumberland Rivers Sub-basin – 6th order and larger interjurisdictional rivers

Rivers	Stream Order	States	Tribal	Federal
Tennessee ~~(including Kentucky Lake, Pickwick Lake, and Guntersville Lake)~~	8	KY, TN, MS, AL		x
Holston[1]	6	TN		x
South Fork Holston	6	TN, VA		x
Wautaga ~~(including Wautaga Reservoir)~~	6	TN, NC		x
French Broad	7	TN, NC		x
Nolichucky	6	TN, NC		x
Little Tennessee ~~(including Tellico and Calderwood Reservoirs)~~	6	TN, NC, GA		x
Clinch	6	VA, TN		x
Emory	6	TN		x
Hiwassee ~~(including Chatuge and Nottely Reservoirs)~~	6	TN, AL		x
Elk	7	TN, AL		x
Tennessee Tombigbee Waterway[2]	N/A	TN, MS, AL		x
Cumberland ~~(including Cordell Hull Lake and Dale Hollow Lake)~~[3]	7	KY, TN		x
Red	6	KY, TN		

Green text are additions to MICRA list.

Navigable Waterway Network additions

1. Emory

NOTES:

~~[1] The Holston River is not an interjurisdictional river, but it is formed by interjurisdictional tributaries.~~

[2] The Tennessee Tombigbee Waterway divide cut is not in the USGS NHD flowline database so no stream order is available for this manmade canal. It is included in MICRA's list because it is an IJ waterway and connects the TN river to the Tombigbee River in the Mobile Drainage. Inland waterway data layer.

Upper Mississippi River Sub-basin – 6th order and larger interjurisdictional rivers

Rivers	Stream Order	States	Tribal	Federal
Mississippi River	10	MN, WI, IA, IL, MO	x	x
Minnesota ~~(incl. Big Stone Lake)~~	8	MN, SD	x	x
Whetstone	6	SD, MN		
St. Croix	6	MN, WI	x	x
Chippewa[1]	7	WI	x	x
Black[1]	6	WI	x	x
Wisconsin[1]	6	WI	x	x
Rock	7	IL, WI		x
Pecatonica	7	IL, WI		
Sugar	6	IL, WI		
Iowa[1]	7	IA	x	x
Des Moines	7	IA, MN, MO		x
Illinois[2]	8	IL		x
Kankakee	6	IN, IL		
Iroquois	6	IN, IL		
Fox	6	WI, IL		x
Missouri	9	MO, NE, SD, ND, MT, IA, KS	x	x
Big Muddy	6	IL		x
Kaskaskia	6	IL		x

Green text are additions to MICRA list.

Navigable Waterway Network

1. Kaskaskia

NOTES:

[1] ~~The Chippewa, Black, Wisconsin, and Iowa rivers~~ Borders or flows through tribal lands or are the ceded territories of 1837 or 1842.

[2] ~~The Illinois River is not an interjurisdictional river, but it is formed by interjurisdictional tributaries~~.

29) Passing of the Gavel: Installation of MICRA Chairperson 2024-2025

Business:

Ben Batten will be installed as the MICRA Chairperson for the 2024-2025 term.
Brad Parsons will assume the non-voting Executive Board position of Immediate Past-Chairperson.

30) Nomination for MICRA Chair-elect 2024-2025

Discussion:

The Executive Board will discuss the nomination of a Missouri River Sub-basin delegate for the vacant MICRA Chair-elect position for the term 2024-2025.

31) Nomination for Lower Mississippi River Sub-Basin Representative

Discussion:

The Executive Board will discuss the status of filling the vacant Lower Mississippi River Sub-Basin Representative position on the MICRA Executive Board.

32) 2024 Workplan Development

Discussion:

The Executive Board will review the MICRA 2024-2028 Priorities Document and discuss a workplan for 2024.

33) Young Professionals Travel Stipend

Decision:

No applications have been received for the 2024 Young Professionals Travel Stipend.

34) Interjurisdictional Fisheries Symposium

Discussion:

The Executive Board will consider the Action Item from the board's August 2021 (?) for MICRA to host a symposium on Interjurisdictional Fisheries Management in the Mississippi River Basin at an upcoming national or regional conference.

Midwest Fish and Wildlife Conference

- 2024 | South Dakota
  January 28 - 31, 2024
  Sioux Falls, South Dakota
- 2025 | Missouri
  Dates & Location TBA
- 2026 | Indiana
  Dates & Location TBA
- 2027 | Michigan
  Dates & Location TBA
- 2028 | Nebraska
  Dates & Location TBA

American Fisheries Society

- 2024 Honolulu, HI: September 15-19, 2024
- 2025 San Antonio, TX: August 10-14, 2025
- 2026 Columbus, OH: August 30- September 3, 2026

35) Schedule Spring Conference Call and Summer Executive Board Meeting

Discussion:

Executive Board members will schedule a Spring conference call and Summer Executive Board meeting.

36) Other New Business / Parking Lot

Discussion:

Executive Board members will address topics put in the parking lot during the meeting and additional business items not on the agenda that board members would like to bring up for discussion.

Executive Board Meeting Minutes

February 7-9, 2023

Engineer Research and Development Center
U.S. Army Corps of Engineers
3909 Halls Ferry Road
Vicksburg, MS

An option for remote participation was provided.

AGENDA

(All times are Central)

Tuesday, February 7, 8:30-12:00 (CST), Environmental Lab Conference Room

Welcome

Dr. David Smith, US Army Corps of Engineers, Engineer Research and Development Center, Environmental Laboratory

Call to Order

1) Call to Order (Brad Parsons)

Chairman and Coordinator Reports

2) Chairman's Report (Parsons)

3) Coordinator's Report (Greg Conover)

Committee Updates

4) MRBP Update (Andrew Stump – remote)

5) MICRA AIS Committee (Conover and Rob Bourgeois)

6) Paddlefish/Sturgeon Committee Update (Ryan Hupfeld – remote)

7) Freshwater Mussel Conservation Society Update (Stephen McMurray) – *tentative*

Old Business

8) Aquatic Habitat Action Plan – Interjurisdictional Rivers Update (Angela Erves)

9) Approval of September 2022 Meeting Notes (Parsons)

10) Review of Action Items (Conover)

[Lunch Break]

Tuesday, February 7, 1:00-5:00 (CST)

Tour ERDC Facilities

No remote option

Wednesday, February 8, 8:30-12:30 (CST), Environmental Lab Conference Room

Member Updates

11) Sub-basin Updates (Sub-basin Representatives)

12) Federal Entity Updates (Rip Shively and Aaron Woldt)

Committee Updates

13) Invasive Carp Advisory Committee (Brian Schoenung and Rob Simmonds)

14) Sub-basin Invasive Carp Partnership Coordination (Partnership Coordinators)

New Business

15) 2023 DC Fly-in Planning (Ashlee Smith)

16) Fishery Commission/Coalition Next Steps (Smith)

17) 2023 Congressional Field Visit / Informational Briefing (Smith)

18) MICRA Delegate Webinar Preparation (Smith)

[Lunch Break]

Wednesday, February 8, 1:30-5:00 (CST), Environmental Lab Conference Room

New Business

19) 2019-2023 Priorities Accomplishment Tracking (Conover)

20) 2024-2028 Priorities Document (All)

21) MICRA Communications Plan (Conover)

22) All Delegate Meeting Planning (All)

Thursday, February 9, 8:30-12:00 (CST), TBD

Tour ERDC Facilities

No remote option; meet at Environmental Lab Conference Room

[Lunch Break]

Thursday, February 9, 1:00-5:00 (CST), Environmental Lab Conference Room

New Business

23) Mississippi River Basin Partnership Initiative (Kim Lutz, Americas Watershed Initiative)

24) Large Rivers Habitat Symposium Update (Neil Rude, MN DNR and Jeff Janvrin, WI DNR)

25) 2022 Invasive Carp Monitoring and Response Plan (Conover)

26) USGS Mississippi River Science Forum and MICRA AIS Presentation (Gaikowski and Conover)

27) Young Professionals Travel Stipend (Conover)

28) Schedule Spring Conference Call and Summer Executive Board Meeting (Parsons)

29) Other New Business / Parking Lot (Parsons)

DECISIONS AND ACTION ITEMS

Decisions

1. The Executive Board requested detailed notes following Executive Board meetings for their reference and a meeting summary to be uploaded to the MICRA website rather than the detailed meeting notes.
2. The Executive Board approved a nomination for Duane Chapman to receive the MICRA River Champion Award.
3. The Executive Board approved the MRBP's request for the MICRA AIS Committee chair to also serve in the MRBP's newly created MICRA Liaison position.
4. The Executive Board will consider development of a storyboard for an interactive map housed on the MICRA website as a next step after the revision of MICRA's list of interjurisdictional rivers has been finalized.
5. The Executive Board approved the revised August 2022 Executive Board meeting notes as final.
6. The Executive Board, sub-basin invasive carp partnership coordinators, and ICAC will all continue to consider and discuss basinwide invasive carp communications needs.
7. The board agreed to provide written member updates for the Winter Executive Board meetings and verbal updates on news or issues from the delegates for the board's summer meetings.
8. The Executive Board decided to table the discussion about the MICRA Communications Plan.
9. The Executive Board will plan for an All Delegate meeting in conjunction with the AFS annual meeting in Grand Rapids, Michigan, in August 2023.
10. The Executive Board will consider requests for speaker travel support to participate in the MICRA-sponsored Large Rivers Aquatic Habitat Restoration symposium during the August 2023 AFS annual meeting on an as needed basis.
11. The Executive Board approved posting the 2022 Invasive Carp Monitoring and Response Plan on the MICRA website and sharing the document with the Invasive Carp Advisory Committee.
12. The Executive Board decided to award the Young Professionals Travel Stipend to Patrick Padilla with the USFWS's Carterville Fish and Wildlife Conservation Office to present his thesis research into determining dam passage and inter-

river movements of Black Carp via otolith microchemistry at the 2023 AFS annual meeting.

13. The Executive Board will plan to meet in conjunction with the AFS annual meeting in Grand Rapids, MI. Travel days will be Sunday, August 20th and Thursday, August 24th.
14. The Executive Board agreed to notify the delegates in the 2023 membership dues notices that they will be requesting the delegates to consider an increase in membership dues for the states to $3,000 beginning in 2024.

Action Items

1. Gaikowski will contact USACE Rock Island District to determine if a letter of support from MICRA can still be included with the USACE's Upper Mississippi River Restoration Program 2022 Report to Congress, and if so, who the letter should be submitted to.
2. Conover will work with Parsons to submit the UMRR letter of support pending the response from USACE Rock Island District.
3. Bourgeois was requested to have the recently updated summary of state regulations for invasive carp posted on the MRBP's website.
4. Conover will invite Duane Chapman to attend the MICRA Executive Board's Summer meeting to receive the MICRA River Champion Award.
5. Conover will review the MICRA By-laws and research Robert's Rules of Order to determine if the MICRA Chair-elect is, or should be, a voting board member.
6. Conover will notify the ANS Task Force Executive Secretary that Rob Bourgeois will now serve as MICRA's primary representative to the ANS Task Force and the MICRA Chair will serve as the alternate voting representative.
7. Hupfeld will send the paddlefish commercial workgroup report to the Paddlefish Sturgeon Committee membership along with a note that the committee is now working to develop a basinwide paddlefish management framework, including an invitation for participation.
8. Parsons will send the paddlefish commercial workgroup report to the MICRA delegates along with a note that the committee is now working to develop a basinwide paddlefish management framework.
9. Conover will contact Stephen McMurray to let him know that MICRA can provide up to $1,000 in financial assistance to support the FMCS Biennial Symposium.
10. Conover will contact Stephen McMurray regarding potential native mussel priorities for the next MICRA priorities document.

11. Angela Erves will provide the Executive Board members with lists of 4th and 5th order and larger interjurisdictional rivers for each sub-basin by the end of February.
12. Executive Board members will review the lists of interjurisdictional rivers provided by Angela Erves and provide a response within 2 weeks.
13. Conover will create meeting minutes from the August 2022 Executive Board meeting notes that include the meeting agenda, participants, and decisions and action items to be uploaded to the MICRA website.
14. Rob Simmonds will send an updated list of ICAC and technical workgroup representatives to Conover; Conover will send to the sub-basin representatives; and the sub-basin representatives will send to their respective sub-basin delegates for their information.
15. Conover will follow-up with Smith to determine what invasive carp maps she is interested in and for what purpose so that he can help her directly or coordinate as needed.
16. Thurman will send an electronic version of the TWRA invasive carp fact sheet to Conover, and he will share it with the board members and invasive carp sub-basin partnership coordinators.
17. Bourgeois will share the TWRA video from the Congressional field visit at Pickwick Dam in August 2021, along with the appropriate context, at the next AIS Committee meeting.
18. Conover was requested to include a reminder about member updates (written or verbal) with Executive Board meeting announcements.
19. Whiteman will share information on Missouri's 2015-2017 study on flatheads and blues in the Missouri and Mississippi rivers with Zweifel.
20. Neal Jackson will put Dave Smith in touch with USFWS staff regarding telemetry data for invasive carp passage at Ohio River dams.
21. The ICAC was asked to provide the Executive Board with a list of questions to survey the basin states regarding limitations, challenges, and needs for increasing staff capacity to collaboratively work on invasive carp and how MICRA can potentially assist address these needs.
22. The ICAC was asked to develop a list of survey questions to gather baseline information from the basin states on current invasive carp removal efforts and potentially other needs to support the workgroups with the basinwide population assessment.

23. The Executive Board will survey the delegates (questions to be developed by the ICAC) regarding staffing or hiring challenges to increase capacity for invasive carp work, as well as asking separate questions regarding the likelihood that the states would use fishery commission funding to hire additional staff to work on collaborative interjurisdictional fisheries management through the commission.
24. The Executive Board will survey the delegates (questions to be developed by the ICAC) regarding current invasive carp removal efforts.
25. Conover will add updates from the sub-basin invasive carp partnerships and the ICAC co-chairs to the agenda for the Executive Board's summer meeting to continue the dialogue between these groups.
26. The MICRA Executive Board will continue to discuss Fishery Commission and Coalition next steps, including the topics to revisit identified during the February 2023 discussion.
27. Smith will schedule a virtual meeting for the Fishery Commission coalition in the next couple weeks.
28. Smith will work with Gaikowski and Rodgers to put together a strategy for organizing Congressional field tours and site visits on the Mississippi River.
29. Smith will work with Gaikowski and Neeley to plan a Congressional field visit at Lock and Dam 19 the week of May 15th, 2023.
30. Smith will work with the partner organizations to identify target dates for an informational Congressional briefing and reception and then follow-up with the Executive Board.
31. Conover was asked to send periodic reminders to the MICRA Delegates requesting them to provide Ashlee Smith with opportunities in their states to get Congressional staffers out on the water.
32. Conover will send a calendar invite and the MICRA Fishery Commission talking points to the MICRA delegates for both February 14th and 16th at 9:00 am Central for a 1-hour briefing on MICRA's fishery commission outreach effort and upcoming DC fly-in. Delegates will be asked to attend one of the two Zoom meetings.
33. Executive Board members will review the draft accomplishment tracking for the 2019-2023 Priorities document and provide suggested additions or changes to Conover.
34. Whiteman will develop a few bullets on the status and needs of habitat restoration related to the authorization for the construction of 166,000 acres of

habitat in the Missouri River as mitigation for the Bank Stabilization and Navigation Project.

35. Conover will provide the Executive Board with a draft 2024-2028 Priorities document by the end of March.
36. The Executive Board will meet in mid-April, approximately 2 weeks after receiving the draft 2024-2028 Priorities document, to discuss the draft and moving it forward to the delegates.
37. Parsons and Conover will schedule two All Delegate Zoom meetings to review MICRA's 2024-2028 Priorities document and request the delegates' input.
38. Conover will incorporate the Delegates comments and a revised draft 2024-2028 Priorities document will be provided to the Delegates for their review prior to the proposed All Delegate meeting in August.
39. Smith will provide Kim Lutz, AWI, with an updated version of MICRA's talking points for the 2023 DC fly-in.
40. Executive Board members were requested to provide contact information to Rude and Janvrin within the next two weeks for a sub-basin volunteer to assist on a committee to plan the Large Rivers Aquatic Habitat Restoration symposium during the August 2023 AFS annual meeting.
41. Conover will work with Neil Rude and Jeff Janvrin to identify opportunities and costs for a networking social following the MICRA-sponsored Large Rivers Aquatic Habitat Restoration symposium during the August 2023 AFS annual meeting.
42. Executive Board members were asked to provide Conover and Parsons with suggestions on the MICRA presentation for the USGS Science Forum and information that MICRA could provide to USGS in the pre- or post-forum surveys.
43. Conover will notify Patrick Padilla that the MICRA Executive Board has awarded him the Young Professionals Travel Stipend to present his thesis research into determining dam passage and inter-river movements of Black Carp via otolith microchemistry at the 2023 AFS annual meeting.
44. Parsons will include a note to the MICRA delegates with the 2023 membership dues notices that the Executive Board will be requesting the delegates to consider an increase in membership dues for the states to $3,000 beginning in 2024.
45. Smith will contact Pat Conzemius with Wildlife Forever to discuss MICRA's initiative for the authorization of a Mississippi River Basin Fishery Commission.

46. Parsons will contact Pat Conzemius via the MICRA email account and request the dates that he will be in St. Louis and Kentucky to initiate a line of communication between Wildlife Forever and MICRA.
47. The MICRA Executive Board and invasive carp committees will consider ways to engage with NGO's (e.g., Wildlife Forever) so they are more informed and aware of the collaborative inter-agency efforts to manage and control invasive carp throughout the basin.

ATTENDANCE

Voting Executive Board Members

Ken Cunningham, ODWC, Arkansas/Red/White Rivers Sub-Basin Representative
Ben Batten, AGFC, Lower Mississippi River Sub-Basin Representative
Kasey Whiteman, MDC, Missouri River Sub-Basin Representative
Rich Zweifel, OH DNR, Ohio River, Sub-Basin Representative
Dave Dreves, KDFWR, Tennessee/Cumberland Rivers Sub-Basin Representative
Joe Larscheid, IA DNR, Upper Mississippi River, Sub-Basin Representative (remote)
Aaron Woldt, USFWS, Federal Entity Representative (remote)
Mark Gaikowski, USGS, Federal Entity Representative

* A quorum (six voting members) was present for the meeting.

Non-voting members

Brad Parsons, MN DNR, MICRA Chairperson
Mike McClelland, IL DNR, MICRA Chairperson-Elect (remote)
Brian Schoenung, IL DNR, MICRA Past Chairman and ICAC Co-Lead
Greg Conover, USFWS, MICRA Coordinator

Committee Chairpersons

Andrew Stump, KDFWR, MRBP Co-Chair (remote)
Rob Bourgeois, LDFW, AIS Committee Chair
Ryan Hupfeld, IA DNR, Paddlefish/Sturgeon Committee Chair (remote)

Introductions:

Ashlee Smith, MICRA Policy and Government Affairs Contractor
Kristi Butler, LDWF
Jerry Brown, MDWFP
Mark Thurman, TWRA
Dave Smith, U.S. Army Corps of Engineers, Engineer Research and Development Center, Environmental Laboratory
Angie Rodgers, USFWS
Rebecca Neeley, USFWS
Neal Jackson, USFWS
Caleb Aldridge, USFWS
Emily Pherigo, USFWS (remote)
Rob Simmonds, USFWS (remote)

Executive Board Meeting Minutes
August 21-23, 2023

Amway Grand Plaza Hotel
187 Monroe Avenue NW
Grand Rapids, MI

An option for remote participation was provided.

MEETING AGENDA

(All times are Eastern)

Monday, August 21, 8:30-12:00, Governor's Room

Call to Order

1) Call to Order (Brad Parsons)

Prepare for MICRA Delegate Meeting

2) Policy and Government Affairs (Ashlee Smith)

3) Success! Now What? Operationalizing the Mississippi River Basin Fishery Commission (Parsons)

4) Review of MICRA's Draft 2024-2028 Priorities Document (Greg Conover)

5) Review of MICRA's Draft Aquatic Habitat Action Plan (Conover)

6) Potential Revisions to MICRA's Constitution and By-laws (Conover)

7) Additional Topics and Preparations for the MICRA Delegate Meeting (Parsons)

Monday, August 21, 1:00-5:00, Governor's Room

MICRA Delegate Meeting

8) MICRA Delegate Meeting Agenda

Tuesday, August 22, 8:00-5:00, DeVos Place – Grand Gallery C

MICRA Sponsored AFS Symposium

9) Mississippi River Basin Habitat Management for Interjurisdictional Fishes Symposium Program

Tuesday, August 22, 5:30-9:30, Governor's Room

MICRA Mixer

Wednesday, August 23, 8:30-12:00, Governor's Room

MICRA Delegate Meeting Follow-up

10) MICRA Delegate Meeting and Symposium After-Action Review (Parsons)

Old Business

11) Mississippi River Basin Fishery Commission Next Steps (Parsons)

12) Legislative, Policy, and Outreach Next Steps (Smith)

13) Finalizing MICRA's Draft Aquatic Habitat Action Plan (Conover)

14) Finalizing MICRA's Draft 2024-2028 Priorities Document (Conover)

15) Finalizing MICRA's Draft 2019-2023 Priorities Accomplishment Tracking (Conover)

16) Approval of the Executive Board's February 2023 Meeting Notes (Parsons)

17) Review of Action Items (Conover)

Wednesday, August 23, 1:00-5:00, Governor's Room

Committee Updates

18) Paddlefish/Sturgeon Committee Update (Sara Tripp)

19) MICRA AIS Committee Update (Bourgeois)

20) MRBP Update (Rob Bourgeois)

21) Invasive Carp Advisory Committee Update (Brian Schoenung and Rob Simmonds)

22) Sub-basin Invasive Carp Partnership Coordination Update (Neal Jackson)

Executive Board Member Updates

23) Executive Board Member Updates (All)

Chairman and Coordinator Reports

24) Chairman's Report (Parsons)

25) Coordinator's Report (Conover)

New Business

26) Webpage Dashboard Demonstration (Rebecca Neeley and Ross Ruehmann)

27) Appointment of New MICRA Chair-elect (Parsons)

28) Develop MICRA's 2024 Operational Budget (Conover)

29) Schedule Fall Conference Call and Winter Executive Board Meeting (Parsons)

30) Other New Business / Parking Lot (Parsons)

DECISIONS AND ACTION ITEMS

* A quorum of voting members was not present throughout the meeting. When necessary, decisions were approved by the Executive Board via email following the meeting.

1. MICRA will target National Invasive Species Awareness Week (NISAW) February 26 – March 1, 2024, for a DC Fly-in event.
2. The Executive Board agreed to target November 8, 2023, for Congressional briefings in Washington, DC.
3. The Executive Board agreed to provide the Aquatic Habitat Action Plan to the delegates once finalized rather than requesting another review of the document.
4. The Executive Board agreed to use 6th order and larger streams for the MICRA list of interjurisdictional rivers in the basin.
5. The Executive Board agreed to continue moving forward with a proposed increase in state member annual membership dues from $1,500 to $3,000 beginning in 2024.
6. The Executive Board agreed that rivers on federal lands, with federal authorities (e.g., navigable streams, National Wild and Scenic Rivers), and those within the Ceded Territories should be included MICRA's list of interjurisdictional rivers.
7. The Executive Board agreed to remove reservoirs from the list of interjurisdictional rivers for consistency across the sub-basins. A general statement about reservoirs could be added.
8. Executive Board members agreed to a 2-week review period of the draft meeting notes for the February 2023 Executive Board meeting once they are provided by Conover.
9. Conover will provide a final list of February 2023 decisions and action items to the Executive Board members along with the final draft meeting notes for the February 2023 meeting.
10. The Executive Board approved a draft letter from the Paddlefish Sturgeon Committee in support of the North American Sturgeon and Paddlefish Society's petition to establish October 27th as National Sturgeon Day.
11. The Executive Board agreed to seek nominations for the MICRA Chair-elect on a "loose" rotation among the following sub-basins: ARW&LMR, MOR, OHR&TNCR, and UMR.
12. The Executive Board tentatively scheduled a virtual meeting from 9am-11am Central on Friday, October 27th.

13. The Executive Board tentatively scheduled an in-person meeting January 29-30, 2024, in Chattanooga, Tennessee, prior to the Southern Division AFS meeting.

Action Items

1. JC Nelson will introduce MICRA to the Mississippi River Cities and Towns Initiative Executive Director, Colin Wellenkamp.
2. Ashlee Smith will attempt to find Congressional sponsors and confirm rooms for Congressional briefings (one Senate and one House) on November 8, 2023.
3. Ashlee Smith will provide a save-the-date email for Congressional briefing in Washington, DC, on November 8, 2023, to Conover for distribution to the MICRA member agencies and USACE.
4. Executive Board members will work to identify a representative from each sub-basin to participate in the proposed Congressional briefings in Washington, DC, on November 8, 2023.
5. Ashlee Smith will send a request for pictures to be used on social media and a Mississippi River Basin Fishery Commission coalition to Conover for distribution to the MICRA Delegates and sub-basin invasive carp partnerships.
6. The Executive Board will attempt to recruit participation from more delegates for short 1- or 2-day visits during the 2024 DC Fly-in.
7. Ashlee Smith will request MICRA Delegates 1) to continue to speak with their agency director regarding the Mississippi River Fishery Commission and associated draft legislation, and 2) to notify her of opportunities to get Congressional staff out to observe field work and talk with delegates.
8. Bourgeois will work with the AIS Committee members to provide any additional AIS priorities for the draft 2024-2028 Priorities document to the Executive Board by November 1.
9. Conover will provide a revised draft 2024-2028 Priorities document to the Executive Board in early November.
10. The Executive Board will review the revised draft 2024-2028 Priorities document and provide it to the MICRA Delegates for a final review by November 30 if there are substantial changes.
11. The Executive Board will finalize the draft 2024-2028 Priorities document and post it on the MICRA website in December.
12. Conover will include a discussion of next steps for aquatic habitat on the agenda for the board’s next meeting.

13. Conover will include a discussion about an interjurisdictional fisheries symposium on the agenda for the board's next meeting, including a list of upcoming meeting dates and locations (e.g., AFS, Midwest, etc.).
14. The Executive Board will develop a justification for a proposed increase in state agency annual membership dues from $1,500 to $3,000 t0 explain why the additional funding is needed, how it will be used, and the benefit it will provide back to the member agencies.
15. Conover will work with Parsons and Batten to send a follow up email to the MICRA Delegates to let them know the board's decision to propose a By-laws amendment to increase the state agency member annual dues to $3,000 beginning in 2024.
16. Batten and Smith will work with the sub-basin representatives to schedule sub-basin or 1-on-1 calls with MICRA delegates to discuss the fishery commission and draft legislation.
17. Neal Jackson will share the TNCR Phase 1 decision analysis results with the MICRA Executive Board once the process is complete and the results have been provided to USACE.
18. Smith will organize a call with the state members of the Executive Board within the next 2-weeks to continue discussing MICRA's 2024 WRDA priorities.
19. Conover will send Smith the additional coalition prospects that were identified by the Executive Board members during their August 2022 meeting.
20. Conover will work with Angela Erves to see if additional information on federal authorities, federal lands, and Ceded Territory can be added to the sub-basin tables of interjurisdictional rivers in the Mississippi River Basin.
21. Conover will follow-up with the respective sub-basin representatives to discuss sub-basin specific questions on the draft lists of 6th order and larger rivers.
22. Conover will update the draft 2024-2028 Priorities document based on the board's review and discussion of the comments discussed during their August 2023 meeting.
23. Conover will update the 2019-2023 Priorities Accomplishment tracking at the end of the year and provide it to the Executive Board members for review.
24. The Executive Board will finalize the draft 2019-2023 Priorities accomplishment tracking after Conover provides a final draft at the end of the year.
25. Conover will provide the draft February 2023 Executive Board meeting notes for review prior to the October 27th meeting.

26. The Executive Board will consider approval of the February 2023 Executive Board draft meeting notes during the October 27th meeting.
27. Executive Board members will review the Decisions and Action Items provided in the August 2023 meeting briefing book and provide updates to Conover as they are addressed.
28. JC Nelson will provide Conover with the soon to be released USGS research priorities for paddlefish and sturgeon for dissemination and review by the Paddlefish Sturgeon Committee members.
29. The Executive Board will consider the information provided by the ICAC regarding the potential allocation of USFWS FY23 “plus-up” funding in FY24 and determine if any recommendation will be provided by MICRA to USFWS.
30. Conover will follow-up with the sub-basin invasive carp partnership coordinators to determine if sub-basin fact sheets can be provided prior to the Congressional briefing tentatively planned for November 8, 2023.
31. Parsons and Smith will update the contractual agreement between MICRA and Ellis Smith Policy Solutions to reflect the 9-month extension that was approved by the Executive Board June 30, 2024.
32. Conover will make proposed updates to the MICRA By-laws and share with the MICRA Executive Board members for discussion during the October 27th meeting.
33. Rebecca Neeley will determine the possibility of the La Crosse FWCO developing a web-based dashboard tool for MICRA that includes MICRA sub-basin group boundaries, congressional districts, MICRA’s 6th order and larger streams, and the characterization of relative abundance of bigheaded carps similar to the figure included in the USFWS-led Report to Congress.
34. The Executive Board will consider what a few top priority communications needs or maps might look like and the data layers that would be needed to develop them.
35. Kasey Whiteman will seek a nomination for the MICRA Chair-elect 2024-2025 term from the Missouri River sub-basin delegates.
36. The Executive Board will vote electronically to approve an additional $5,000 travel budget for Ashlee Smith for the remainder of 2023.
37. The Executive Board will vote electronically to approve the proposed 2024 operational budget with the addition of $1,000 to support ICAC and sub-basin invasive carp partnership meeting expenses.

MEETING ATTENDEES

Voting Executive Board Members

Ken Cunningham, ODWC, Arkansas/Red/White Rivers Sub-Basin Representative
Mark Thurman[1], TWRA, Lower Mississippi River Sub-Basin Representative
Kasey Whiteman[1], MDC, Missouri River Sub-Basin Representative
Rich Zweifel, OH DNR, Ohio River Sub-Basin Representative
Dave Dreves, KDFWR, Tennessee/Cumberland Rivers Sub-Basin Representative
Joe Larscheid[1], IA DNR, Upper Mississippi River Sub-Basin Representative
Aaron Woldt[1], USFWS, Federal Agency Executive Board Member
JC Nelson, USGS, Federal Agency Executive Board Member

* A quorum of six voting members was not in attendance throughout the meeting.

Non-Voting Executive Board Members

Ben Batten, AGFC, MICRA Chairperson-Elect and Acting MICRA Chair
Brian Schoenung, IL DNR, MICRA Immediate Past Chairperson and ICAC Co-Chair
Greg Conover, USFWS, MICRA Coordinator

MICRA Committee Chairs

Rob Bourgeois[1], LDFW AIS Committee Chair and MRBP MICRA Liaison
Rob Simmonds, USFWS, Invasive Carp Advisory Committee Co-Chair
Sara Tripp[1], IL DNR, Paddlefish/Sturgeon Committee

Introductions

Allan Brown, USFWS
Angie Rodgers, USFWS
Ashlee Smith, Sequoya Strategies
Dave Smith, USACE-ERDC
Jeff Janvrin, WI DNR
Neil Rude, MN DNR
Neal Jackson[1], USFWS
Caleb Aldridge[1], USFWS
Rebecca Neeley[1], USFWS
Ross Ruehlmann[1], USFWS

[1] Remote attendee during a portion of the meeting

MICRA Delegate Meeting Minutes
August 21, 2023
1:00 PM – 5:00 PM (EST)

Amway Grand Plaza Hotel
Governor's Room
187 Monroe Avenue NW
Grand Rapids, MI

An option for remote participation was provided.

MEETING AGENDA

(All times are Eastern)

1:00 Welcome and Introductions (Brad Parsons)

1:10 MICRA's Policy and Government Affairs Work in 2023 (Ashlee Smith)

- Fishery Commission Initiative, Legislative, and Coalition Progress
- Next Steps for Congressional and Partner Outreach

2:30 Success! Now what? Operationalizing the Mississippi River Basin Fishery Commission (Parsons)

3:00 Break / Refreshments

3:30 MICRA's Draft 2024-2028 Priorities Document (Parsons and Greg Conover)

4:00 MICRA's Draft MICRA's Aquatic Habitat Action Plan (Parsons and Conover)

4:30 Proposal to Increase MICRA Member Annual Dues (Parsons)

4:50 Closing Remarks (Parsons)

5:00 Adjourn / Mixer

6:00 Mixer Closes

ACTION ITEMS

1. Delegates were asked to let Ashlee Smith or Ben Batten know if they would be willing to participate in the 2024 DC Fly-in tentatively scheduled for February 26 – March 1, 2024.
2. Delegates were requested to assist with providing two-sided state fact sheets with AIS issues on one side and interjurisdictional fisheries information on the other side (template to be provided by the AIS Committee) by the end of January 2024 for use during MICRA's 2024 DC Fly-in.
3. The draft legislation to authorize a Mississippi River Basin Fishery Commission and MICRA talking points will be shared with the delegates again following the meeting.
4. Delegates were asked to make sure their directors are briefed on the proposed Mississippi River Basin Fishery Commission and the associated draft legislation that will soon be introduced into the Senate Environment and Public Works (EPW) Committee.
5. Delegates may be requested by Ashlee Smith this fall to participate in remote meetings with staff in Congressional Offices in their states to discuss the proposed Mississippi River Basin Fishery Commission.
6. Delegates were asked to let Ashlee Smith know if there are organizations in their respective states that should be briefed and invited to participate in the Mississippi River Basin Fishery Commission coalition.
7. Delegates (and their staff) were asked to text (601-988-8577) or email (asmith@sequoya.org) Ashlee Smith pictures with a short description of their field work, Mississippi River Basin scenery, interjurisdictional fish, AIS, etc. to be used on the coalition website and social media posts.
8. Delegates were asked to let Ashlee Smith know whenever there is an opportunity to invite Congressional staff out to observe large rivers field work.
9. Delegates were asked to contact Ashlee or Ben Batten if they are interested in participating or have staff that they would like to have participate in the Congressional briefing in DC tentatively planned for November 8.
10. Ashlee Smith will investigate the governance documents of existing fishery commissions.
11. The Executive Board will provide the Delegates with a final draft of the 2024-2028 Priorities Document later this Fall and highlight any major revisions or additions so they can be quickly and easily reviewed.

12. The Executive Board will share the final version of the MICRA Aquatic Habitat Action Plan with the delegates once it is finalized this Fall.
13. The Executive Board will consider adding information to the revised list of interjurisdictional rivers in the basin on federal authorities and ceded territories that result in interjurisdictional management of fisheries and aquatic resources.
14. The Executive Board will reconsider the amount of the proposed annual dues increase for state agency members and develop a justification that explains why the increase is needed and identifies what the states will get back in return for their investment in the partnership.

MEETING ATTENDEES

1. Ben Batten, Arkansas Game and Fish Commission, MICRA Chair-elect
2. Dave Smith, U.S. Army Corps of Engineers
3. George Scholten, Iowa Department of Natural Resources
4. Rich Zweifel, Ohio Department of Natural Resources, Ohio River Sub-basin Representative
5. Ken Cunningham, Oklahoma Division of Wildlife, Arkansas-Red-White Rivers Sub-basin Representative
6. JC Nelson, U.S. Geological Survey
7. Dave Dreves, Kentucky Department of Fish and Wildlife Resources, Tennessee-Cumberland Rivers Sub-basin Representative
8. Greg Conover, U.S. Fish and Wildlife Service, MICRA Coordinator
9. Justine Hasz, Wisconsin Department of Natural Resources
10. Angie Rodgers, U.S. Fish and Wildlife Service, LMRCC Coordinator
11. Allan Brown, U.S. Fish and Wildlife Service
12. Raynie Harlan, Louisiana Department of Wildlife and Fisheries
13. Ashlee Smith, Sequoya Strategies, MICRA Contractor
14. Kevin Irons, Illinois Department of Natural Resources
15. Brian Schoenung, Illinois Department of Natural Resources, MICRA Past-chair
16. Tim Bister, Texas Parks and Wildlife
17. Aaron Woldt, U.S. Fish and Wildlife Service[1]
18. Katie Zipfel, West Virginia Department of Natural Resources[1]
19. Christian Waters, North Carolina Wildlife Resources Commission[1]
20. Bob Caccese, Pennsylvania Fish and Boat Commission[1]
21. Heather Smiles, Pennsylvania Fish and Boat Commission[1]
22. Clint Jones, Tennessee Valley Authority[1]
23. Bruce Drektrah, Missouri Department of Conservation[1]
24. Jerry Brown, Mississippi Department of Wildlife, Fisheries, and Parks[1]
25. Mark Thurman, Tennessee Wildlife Resources Agency[1]
26. John Lott, South Dakota Game Fish and Parks[1]
27. Brad Parsons, Minnesota Department of Natural Resources[1]

[1] Remote participant

Goals, Objectives, and Priorities

2024 - 2028

Contents

Introduction

MICRA works to preserve, protect, restore, and enhance interjurisdictional fishery resources and aquatic habitats in the Mississippi River Basin (Basin) through cooperative assessment and management of the basin's aquatic resources. MICRA's member agencies developed a comprehensive Strategic Plan in 1991 and completed an Activity Prioritization of the Plan's 10 goals and 133 tasks in 1992.

The MICRA Executive Board established an Operational Plan for the 5-year period 2014-2018 to focus on a much smaller subset of priorities for the partnership to accomplish during the operational period through the work of member agency delegates, the Executive Board, and committees. This Operational Plan, which is updated every five years, is intended to be a guiding document that is timely and responsive to the current biological, social, and political issues that influence fishery resource management. As such, the Operational Plan is an adaptive document that will be updated as needed to remain relevant and provide for the most effective cooperative management of the fishery and aquatic resources in the basin.

MICRA developed 'A Joint Strategic Plan for Management of Mississippi River Basin Fisheries' (Joint Strategic Plan) in February 2021. Twenty-six of the twenty-eight MICRA member state agency Directors have signed a Memorandum of Acceptance of the Joint Strategic Plan. The Joint Strategic Plan is intended to serve as a foundational document for the proposed Mississippi River Basin Fishery Commission (Fishery Commission). Based on mission statements, the following common goal statement was developed to represent the shared intent of the MICRA member agencies regarding interjurisdictional fishery resources in the Basin:

> *Coordinate the conservation, development, and utilization of sustainable interjurisdictional fishery and aquatic resources in the Mississippi River Basin for the public through cooperative management among the responsible entities.*

The Joint Strategic Plan identifies four key problem areas that must be addressed to comprehensively manage interjurisdictional fishery resources now and in the future and identifies broad strategies and strategic processes necessary to collaboratively resolve these complex issues.

Problem Areas

1. Aquatic Invasive Species
2. Inadequate Resources for Research and Management of Shared Fisheries

3. Habitat Loss and Degradation
4. Limited Public and Stakeholder Involvement and Support

Strategies

1. Ecosystem Management
2. Information Management and Sharing
3. Outreach and Communication
4. Consensus
5. Accountability

Accomplishing this shared goal statement would benefit from increased diversity, equity, inclusion, and accessibility in human resources working on fisheries and aquatic resources and by providing opportunities for the public to become engaged in this effort.

MICRA drew heavily from its Joint Strategic Plan in the development of this Operational Plan for 2024-2028. However, the absence of a federal authorization and appropriations to form and support the proposed Fishery Commission constrains full implementation of the Joint Strategic Plan.

MICRA's priorities and accomplishments for the operational period 2019-2023 are reported in Appendix 1.

Goals and Objectives

GOALS

I. Coordinate basin-wide management of interjurisdictional fishery resources and aquatic habitats among the responsible management entities. *[INTERNAL COMMUNICATION]*

II. Increase awareness, support, and funding for basin-wide management of interjurisdictional fishery resources and aquatic habitats. *[EXTERNAL COMMUNICATION]*

OBJECTIVES

1. Coordinate implementation of interjurisdictional fishery and aquatic resource management programs throughout the basin. *[IJ FISH]*
2. Identify priority habitat restoration needs for the Mississippi River Basin, coordinate with national and regional aquatic habitat initiatives, and provide a forum for information and technical exchange. *[AQUATIC HABITAT]*
3. Coordinate prevention and control measures for Aquatic Invasive Species (AIS) to ensure sustainable native aquatic ecosystems within the basin. *[AIS]*
4. Develop and implement a communication plan for disseminating information to target audiences. *[COMMUNICATION]*
5. Secure funding for long-term operational needs and implementation of basin-wide programs. *[FUNDING]*

Priorities

Objective 1: Coordinate implementation of interjurisdictional fishery and aquatic resource management programs.

MICRA Joint Strategic Plan Excerpt

Problem Area: Limited Public and Stakeholder Involvement and Support

Interjurisdictional management of shared fishery and aquatic resources throughout the basin would benefit from:

- Basin-wide plans that prioritize fishery management needs and identify mechanisms for the development of shared management objectives and collaborative implementation, data sharing, and evaluation of management actions.
- Improving communication, coordination, and collaboration among state and federal agencies and NGOs to identify shared priorities, interests, and opportunities to address significant problem areas affecting long-term management of self-sustaining interjurisdictional fishery resources in the basin.
- Promoting partnerships (working and funding) among governments, the public, and NGOs to promote economic and environmental security and stability along the Mississippi River and its tributaries.
- Effective non-technical communication resulting in increased public awareness and improved public perception of the economic, social, and cultural value of the basin's natural resources.
- Effective stakeholder involvement practices to identify public concerns and values, develop consensus among affected parties, and produce efficient and effective solutions through an open, inclusive process.

Priorities:

1. Identify and prioritize basin-wide resource management issues of concern in the Mississippi River Basin.
    a) MICRA delegates meet every 3-5 years to review priorities and discuss emerging issues of concern within the basin.
    b) Standing committees review priorities and discuss emerging issues of concern within the basin every 3-5 years. Committees will report to the Executive Board at least once annually on

progress of priorities identified in this document.

c) Encourage and support the development of sub-basin management plans under the *Joint Strategic Plan for Management of Mississippi River Basin Fisheries*.

d) Executive Board updates MICRA's priorities document every 5 years.

2. Use standing technical committees and temporary working groups as needed to provide for the development of coordinated strategies to address priority issues and identify basin-wide research needs to support conservation, management, and utilization of native interjurisdictional fishes and aquatic resources.

a) Support continued efforts for coordinated basin-wide management of paddlefish and sturgeon species.

i. The Paddlefish and Sturgeon Committee will complete a basin-wide management framework for paddlefish.

ii. Develop or update sub-basin paddlefish management plans in support of the basin-wide paddlefish management framework.

iii. The Paddlefish and Sturgeon Committee will consider the need for coordination and management of a basin-wide tag database for paddlefish in support of the basin-wide paddlefish management framework and the sub-basin management plans, and provide recommendations to the Executive Board regarding the future of the database.

iv. The Paddlefish and Sturgeon Committee will provide the Executive Board with a recommendation and cost estimate for completing sensitivity analysis of the available paddlefish age and growth data from commercial harvest states to inform priority next steps and additional research needs.

v. The Paddlefish and Sturgeon Committee will develop a list of priority research needs to advance cooperative interjurisdictional management of paddlefish and sturgeon.

b) Support and collaborate with the Freshwater Mollusk Conservation Society ~~on their~~to enable native mussel ~~work~~ conservation efforts that impacts or is impacted by

interjurisdictional fisheries in the Mississippi River Basin.

i. The Freshwater Mollusk Conservation Society will be invited at least once per year to meet with the MICRA Executive Board to discuss native freshwater mussel priorities in the Mississippi River Basin.

3. Build consensus for compatible regulations and policies for priority interjurisdictional fishery and aquatic resources issues.

   a) Encourage and facilitate law enforcement participation in the development of collaborative management and regulatory strategies to support conservation, management, and utilization of interjurisdictional fishes and aquatic resources, including to preventing the introduction and spread of aquatic invasive species.

   b) Work with USFWS and AFWA to host a facilitated workshop or meetings for biologists and law enforcement representatives from paddlefish and sturgeon commercial harvest states to determine the need for standardized methods for documenting and reporting harvest data, developing and maintaining basin-wide commercial harvest databases including roe harvest and roe buyers, and developing a system for tracking commercially harvested roe through final sale.

4. Determine the socio-economic value of fishery resources and related recreation in the Mississippi River Basin.

   a) Work with USFWS to provide a written economic value report for the Mississippi River Basin, including an analysis by MICRA sub-basin boundaries, using 2022 National Survey of Fishing, Hunting, and Wildlife Associated Recreation data.

   b) Work with USFWS to explore the possibility of developing a report that includes an estimated return on dollars invested to manage fishery resources in the Mississippi River Basin based on 2022 National Survey of Fishing, Hunting, and Wildlife Associated Recreation data. (Report similar to the USFWS 2011 publication 'Net Worth: The Economic Value of Fisheries Conservation' that focuses on contributions to the U.S. economy in terms of jobs created and conservation stimulated commerce.)

Objective 2: Identify priority habitat restoration needs for the Mississippi River Basin, coordinate with national and regional aquatic habitat initiatives, and provide a forum for information and technical exchange.

MICRA Joint Strategic Plan Excerpt

Problem Area: Habitat Loss and Degradation

Interjurisdictional management of shared fisheries habitat loss and degradation throughout the basin would benefit from the following actions:

- Strategically coordinating interstate and inter-agency actions to identify mutually beneficial (ecology, economics, human health, safety) solutions for addressing:
    - Watershed improvements to maximize benefit to interjurisdictional rivers and reservoirs,
    - Floodplain habitat improvements for interjurisdictional fishes,
    - Conflicting water uses that address interjurisdictional fish habitat needs.
- Effectively identifying the combination of measures needed to restore water quality and quantity in areas where it has the greatest impact on fish stocks and habitats.
- Coordinating actions to address past, present, and potential future sources of contamination (i.e., pharmaceuticals and plastics).

Priorities:

1. The Executive Board will identify and implement next steps for the MICRA Aquatic Habitat Action Plan completed in 2023.
2. Identify and support opportunities to establish regular information exchange, communication, and coordination between entities responsible for aquatic habitat management in the basin.
3. Create awareness of the needs and opportunities to increase and direct funding to implement priority habitat projects identified in the MICRA Aquatic Habitat Action Plan.

Objective 3: Coordinate prevention and control measures for Aquatic Invasive Species (AIS) to ensure sustainable aquatic ecosystems within the basin.

MICRA Joint Strategic Plan Excerpt

Problem Area: Aquatic Invasive Species

Interjurisdictional management and control of aquatic invasive species throughout the basin would benefit from:

- Coordinated delivery of basin-wide, state-based invasive carp management and control actions, in partnership with relevant federal agencies, to achieve the goals and objectives of the national *Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States*.
- Coordinated regulatory strategies and enforcement to prevent the introduction of new AIS, and the transportation and spread of existing AIS within the basin.
- Effective actions to minimize the risk of introduction of AIS from other watersheds via man-made (e.g., Great Lakes via the Chicago Area Waterway System) and natural connections.
- Coordinated planning, implementation, and evaluation of management and control actions to minimize the abundance of AIS introduced within the basin.
- Comprehensive monitoring and assessment programs to provide for the evaluation of AIS impacts on native species and ecosystems, and to inform the effective implementation of management and control actions within the basin.
- Execution of Mutual Aid and similar agreements to empower the basin states to work together to address a serious regional threat from AIS.
- Research and development of deterrents and control tools to contain and reduce the abundance of AIS in the basin.

Priorities:

1. Serve as an *ex officio* member of the national Aquatic Nuisance Species Task Force.
2. Host, coordinate, and support activities of the Mississippi River Basin Panel on Aquatic Invasive Species, a regional advisory committee to the national Aquatic Nuisance Species Task Force.

3. Support a standing technical committee on Aquatic Invasive Species for coordination of basin-wide efforts to prevent introductions, manage introduced populations, and develop recommendations regarding AIS policy concerns.
4. Seek Congressional support to strengthen the Injurious Wildlife provisions of the Lacey Act.
    a) The Aquatic Invasive Species Committee will identify needs and provide recommendations to the Executive Board to promote streamlining of the Lacey Act Injurious Wildlife Listing process.
    b) The Aquatic Invasive Species Committee will identify needs and provide recommendations to the Executive Board for establishment of an efficient federal screening process to evaluate risk of non-native species prior to importation, particularly species not already in trade.
    c) The Aquatic Invasive Species Committee will identify needs and provide recommendations to the Executive Board for establishment of an efficient federal screening process for organisms in trade.
5. Promote development of consistent basin-wide regulatory approaches for the management of AIS.
    a) The Executive Board will facilitate meetings and discussions with the states that allow stocking of diploid grass carp within the basin, as needed, to establish regulatory consistency for grass carp as recommended in the February 2015 MICRA Grass Carp Report.
    b) The Mississippi River Basin Panel and Aquatic Invasive Species Committee will coordinate efforts to implement recommendations in the February 2015 MICRA Grass Carp Report.
    c) The AIS committee will work to develop model baitfish regulations that can be used by states within the Mississippi River Basin to limit the ~~impacts~~ movement of AIS and ~~hitchhikers~~pathogens ~~in~~through the bait fish trade.
    d) The AIS Committee will engage in and support national efforts to develop model regulations for Organisms in Trade.
6. Support efforts to prevent the exchange of AIS between the Mississippi River basin and connected watersheds such as the Great Lakes and

Mobile River basins.

a) Raise awareness of the immediate need for the U.S. Army Corps of Engineers to initiate the scoping phase for a feasibility study to prevent the *two-way* transfer of AIS as the next step for the Great Lakes and Mississippi River Interbasin Study authorized by Congress in the Water Resources Development Act of 2007.

7. Support the Invasive Carp Advisory Committee for ~~basinwide~~basin-wide coordination to develop collaborative advice and recommendations on the development, implementation, and assessment of management and control actions across the six sub-basin partnerships to promote a unified, collaborative strategy for the Mississippi River Basin.

   a) In partnership with USFWS, coordinate the collaborative development of an annual Monitoring and Response Plan to identify highest priority management actions for invasive carps in the Mississippi River Basin.

   b) Coordinate the collaborative development, prioritization, and submission of an annual basin-wide suite of priority project proposals to USFWS for federal funding assistance to implement sub-basin Invasive Carp Control Strategy Frameworks.

   c) Develop recommendations for population assessment approach(es) to evaluate the ~~success of management actions in reducing the~~change in abundance and/or distribution of invasive carp across the basin in response to management actions.

   d) Develop recommendations for coordinating invasive carp removal programs on a basin-wide scale.

8. Promote the development and support promulgation of consistent outreach materials and messages throughout the Mississippi River Basin to support AIS prevention, management, and control.

   a) The Aquatic Invasive Species Committee will review and make recommendations for revising the MICRA AIS Action Plan so that it remains a relevant outreach tool.

   b) Seek support from USFWS and other partners for collaborative sub-basin and basin-wide internal and external invasive carp communication needs.

Objective 4: Develop and implement a communication plan for disseminating information to target audiences.

Priorities:

1. Identify and implement an approach for developing a MICRA communications plan.
2. Continue to host and manage content on the MICRA website.
3. Engage in efforts to increase awareness and action of Congressional members to improve management of fishery and aquatic resources in the Mississippi River Basin.
4. Develop a 5-year report of activities, accomplishments, and remaining resource needs identified in the MICRA priorities document.
5. Host workshops and networking opportunities at national and regional professional meetings (e.g., Midwest Fish & Wildlife Conference, SEAFWA, AFS Parent Society meetings) for MICRA member agency delegates, committee members, and partners.

Objective 5: Secure funding for long-term operational needs and implementation of basin-wide programs.

MICRA Joint Strategic Plan Excerpt

Problem Area: Inadequate Resources for Research and Management of Shared Fisheries

Interjurisdictional management of fishery and aquatic resources throughout the basin would benefit from:

- Increasing communication of the status of these fishes, habitat needs, harvest statistics, and barriers to effective management efforts.
- Identifying the research, management, and conservation actions necessary to maintain and recover species classified as threatened, endangered, or species of concern.
- Increasing coordination and funding support for research necessary to inform management activities and provide for improved management of interjurisdictional fishery resources.
- Promoting partnerships (working and funding) among governments, the public, and non-governmental organizations (NGOs) to manage shared fishery resources.
- Facilitating effective management strategies that allow movement of native fishes while deterring invasive species.
- Implementing coordinated efforts to standardize and compile agency harvest regulations for interjurisdictional fishery resources.

Priorities:

2. Pursue reliable, long-term funding sources and mechanisms for MICRA.
3. Work with MICRA member agencies, partner organizations, and stakeholder groups to pursue formation of a congressionally funded Mississippi River Basin Fishery Commission to facilitate cooperative management of interjurisdictional fishery and aquatic resources among the state, tribal, and federal management agencies; control AIS (e.g., invasive carps, mussels, and vegetation); and coordinate research to inform and evaluate fisheries management and AIS control actions.

Appendix 1: MICRA's Priorities and Accomplishments 2019-2023

Goals and Objectives

GOALS

I. Coordinate basin-wide management of interjurisdictional fishery resources and aquatic habitats among the responsible management entities. *[INTERNAL COMMUNICATION]*

II. Increase awareness, support, and funding for basin-wide management of interjurisdictional fishery resources and aquatic habitats. *[EXTERNAL COMMUNICATION]*

OBJECTIVES

1. Coordinate implementation of interjurisdictional fishery and aquatic resource management programs throughout the basin. *[IJ FISH]*
2. Identify priority habitat restoration needs for the Mississippi River Basin, coordinate with national and regional aquatic habitat initiatives, and provide a forum for information and technical exchange. *[AQUATIC HABITAT]*
3. Coordinate prevention and control measures for Aquatic Invasive Species (AIS) to ensure sustainable native aquatic ecosystems within the basin. *[AIS]*
4. Develop and implement a communication plan for disseminating information to target audiences. *[COMMUNICATION]*
5. Secure funding for long-term operational needs and implementation of basin-wide programs. *[FUNDING]*

Progress on addressing MICRA's 2019-2023 priorities to address these goals and objectives is tracked on the following pages. Accomplishments during the operational period are noted under each priority in blue font. On-going actions and notes on priorities not addressed during the operational period are indicated in red font.

Priorities

Objective 1: Coordinate implementation of interjurisdictional fishery and aquatic resource management programs.

Priorities:

1. Identify and prioritize basin-wide resource management issues of concern in the Mississippi River Basin.

   a) MICRA delegates meet every 3-5 years to review priorities and discuss emerging issues of concern within the basin.

   - An in-person MICRA Delegate meeting was planned for January 2020 but had to be cancelled due to the Covid-19 pandemic.
   - A virtual MICRA Delegate meeting was held in October 2020. The focus of the meeting was the draft Joint Strategic Plan, Mississippi River Basin Fishery Commission Proposal, and Congressional outreach.
   - ~~An in-personA~~ MICRA Delegate meeting (in person/remote) was held in August 2023 in conjunction with the American Fisheries Society annual meeting. ~~A remote option was provided for those unable to attend in person.~~

   b) Standing committees review priorities and discuss emerging issues of concern within the basin every 3-5 years. Committees will report to the Executive Board at least once annually on progress of priorities identified in this document.

   - The Executive Board reviewed MICRA's 2018-2023 priorities with the committee chairs in August 2022. The Committee chairs were charged with addressing the current priorities and reporting back on progress and new priorities.
   - Standing committee updates were included during Executive Board meetings in February and August 2023.

   c) Executive Board updates MICRA's priorities document every 5 years.

   - A 2024-2028 Priorities document was developed with input from the MICRA Delegates and standing committees and will be posted on the MICRA website in January 2024.

2. Use standing technical committees and temporary working groups as needed to provide for the development of coordinated strategies to address priority issues and identify basin-wide research needs to support conservation, management, and utilization of native interjurisdictional fishes and aquatic resources.

   - The Executive Committee considered the status of all standing committees, and their alignment with the Joint Strategic Plan and Priorities Document. The Gamefish and Native Mussel committees were sunset in May 2021. The Habitat committee was sunset in August 2021.
   - The Invasive Carp Advisory Committee was revised in 2021 and is now a standing committee that reports to the Executive Committee.
   - A MICRA Aquatic Invasive Committee was reformed and held its first meeting in September 2022.

   a) Support continued efforts for coordinated basin-wide management of paddlefish and sturgeon species.

      - The Paddlefish Sturgeon Committee met annually 2018 through 2023. The committee was able to meet in person each year except 2021.
      - Supported a Paddlefish Commercial Harvest States Workgroup. The workgroup provided a report to the Executive Board in 2023 that includes a suite of recommendations for advancing cooperative interagency management of Paddlefish in the Mississippi and Ohio rivers.

   b) The Paddlefish Sturgeon Committee will develop a basin-wide management plan for paddlefish.

      - *On-going*: MICRA funded a contractor to facilitate the development of a ~~basinwide~~basin-wide Paddlefish management framework. A workgroup was formed and began working on this project in late 2022. The Framework is expected to be completed in 2 years.

   c) The Paddlefish Sturgeon Committee will continue to coordinate and manage (e.g., regional tag coordinators) a basin-wide coded-wire tag database for paddlefish.

      - The committee continues to maintain the database. The

~~basinwide~~basin-wide framework will inform the future management of this database.

d) The Paddlefish Sturgeon Committee will provide recommendations to the Executive Board for standardized methods for documenting and reporting harvest data for paddlefish.

- *On-going*: The committee will address this charge once the ~~basinwide~~basin-wide framework document is complete.

e) The Paddlefish Sturgeon Committee will provide recommendations to the Executive Board for basin-wide commercial harvest databases for paddlefish and sturgeon, including roe harvest and roe buyers.

- *On-going*: The committee will address this charge once the ~~bsinwide~~basin-wide framework document is complete.

f) Conserve native freshwater mussels through continued support of the Freshwater Mollusk Conservation Society (FMCS).

- MICRA provided $1,000 to sponsor the FMCS's 2019 Symposium. MICRA was not requested for financial assistance in 2020-2023.
- The MICRA Executive Board met with the President of the FMCS in August 2022. The FMCS and MICRA will continue to support each other's native mussel conservation needs.
- The Executive Board and FMCS President agreed that formal recognition that explicitly identifies the partnership between the two organizations in their governance documents would be beneficial. For example, language to clarify that the FMCS will function in the place of a Native Mussel Committee for MICRA and provide recommendations to the Executive Board as needed. Similarly, the FMCS should refer to MICRA in their guidance documents and providing an annual update to the Executive Board.

g) Native Mussel Committee will provide recommendations to the Executive Board for standardized methods for documenting conservation strategies employed in mussel conservation.

- This priority was discussed with the FMCS President in August 2022. The board was informed that this priority is

being addressed in other ways. It was recommended that MICRA defer to the FMCS to identify native mussel conservation priorities and then support the society as needed.

h) Native Mussel Committee will develop and maintain a Basin wide list of propagation facilities and species that are being produced at each location.

- This priority was discussed with the FMCS President in August 2022. The FMCS has a committee that has been working to develop and maintain a list of mussel propagation facilities in the U.S., including information on the species and production numbers. The list is available on request of the Conservation and Restoration Technical Committee chair.

3. Build consensus for compatible regulations and policies for priority interjurisdictional fishery and aquatic resources issues.

a) Executive Board will work with the MICRA delegates to develop a Joint Strategic Plan for Management of Mississippi River Basin fisheries.

- The Joint Strategic Plan was finalized in February 2021.
- Agency directors from 26 of 28 MICRA member states have signed on to the Joint Strategic Plan through a Memorandum of Agreement. (Only Montana and Wyoming have not signed.)

4. Determine the socio-economic value of fishery resources and related recreation in the Mississippi River Basin.

a) Work with USFWS to provide a written economic value report for the Mississippi River Basin, including an analysis by MICRA sub-basin boundaries, using 2016 National Survey of Fishing, Hunting, and Wildlife Associated Recreation data.

- The Executive Board met with USFWS in February 2022 to discuss the possibility of developing a new report. USFWS informed MICRA that it would not be possible to use the 2016 data and that there would be limitations with the 2021 data due to limited participation by the states.
- *On-going*: The USFWS agreed to work with MICRA to complete a new report once the information from the most

recent survey is received in 2023. An update is scheduled for January 2024.

b) Work with USFWS to develop a report that includes an estimated return on dollars invested to manage fishery resources in the Mississippi River Basin based on 2016 National Survey of Fishing, Hunting, and Wildlife Associated Recreation data. (Report similar to the USFWS 2011 publication 'Net Worth: The Economic Value of Fisheries Conservation' that focuses on contributions to the U.S. economy in terms of jobs created and conservation stimulated commerce.)

- This was not addressed due to limited participation by the states in the surveys in 2016 and 2021.

c) Work with USFWS to develop methods of extracting use and socio-economic value information for fishery resources and related recreation for the MICRA sub-basin units (reported for the basin as a whole) from the USFWS 5-year national survey of fishing, hunting, and recreational use. (Similar to how information for the Great Lakes is broken out and reported now.)

- This was not addressed due to limited participation by the states in the surveys in 2016 and 2021.

Objective 2: Identify priority habitat restoration needs for the Mississippi River Basin, coordinate with national and regional aquatic habitat initiatives, and provide a forum for information and technical exchange.

Priorities:

1. The Executive Board will finalize the draft MICRA Aquatic Habitat Action Plan prepared by the Aquatic Habitat Committee.

- On-going: The Action Plan is expected to be finalized in early 2024 ~~by the end of 2023~~.

- A new list of 6th order and larger interjurisdictional rivers in the basin was developed during the development of the Aquatic Habitat Action Plan.

2. Support Aquatic Habitat Committee efforts to establish regular information exchange, communication, and coordination between entities responsible for aquatic habitat management in the basin.

- The Aquatic Habitat Committee was sunset in August 2021

following the development of the draft Aquatic Habitat Action Plan.

- MICRA hosted a large rivers habitat symposium at the American Fisheries Society annual meeting in August 2023.

3. The Aquatic Habitat Committee will identify and make recommendations to the Executive Board for engaging with the National Fish Habitat Partnerships and coordinating priorities in the MICRA Aquatic Habitat Action Plan.

   - The Aquatic Habitat Committee was sunset in August 2021 following development of the Aquatic Habitat Action Plan.
   - No action is planned for this priority.

4. Create awareness of the needs and opportunities to increase and direct funding to implement priority habitat projects identified in the MICRA Aquatic Habitat Action Plan.

   - The *Joint Strategic Plan for Management of Mississippi River Basin Fisheries* completed in February 2021 identifies and discusses 'Habitat Loss and Degradation' as one of four key problem areas that must be addressed to comprehensively manage self-sustaining interjurisdictional fishery resources in the basin.
   - The need for and value of ~~A~~aquatic habitat and ecosystem rehabilitation ~~restoration talking points were included in~~were conveyed during a ~~C~~congressional staff field visit in La Crosse, Wisconsin, hosted by MICRA in conjunction with the Upper Mississippi River Basin Association in August 2023.
   - The need for and value of ~~A~~aquatic habitat and ecosystem rehabilitation ~~restoration talking points were included in~~were conveyed during a MICRA-sponsored Congressional briefing with Senate staff in November 2023.
   - *On-going*: The MICRA Aquatic Habitat Action Plan will be posted on the MICRA website after it is finalized in ~~2023~~early 2024.

Objective 3: Coordinate prevention and control measures for Aquatic Invasive Species (AIS) to ensure sustainable aquatic ecosystems within the basin.

Priorities:

1. Host the Mississippi River Basin Panel (MRBP) on Aquatic Nuisance Species for coordination of basin-wide efforts to prevent introductions

of AIS and manage introduced AIS populations.

- MICRA continued to host the MRBP from 2019-2023.

2. Prevent, manage, and control AIS in the Mississippi River Basin by supporting the Aquatic Invasive Species Committee.
   - The MICRA AIS Committee was reformed to address MICRA priorities that the MRBP is not able to address as a FACA-regulated advisory panel to the ANS Task Force.
   - The AIS Committee held its first meeting in September 2022.
3. Promote strengthening of Injurious Wildlife provisions of the Lacey Act.
   - Discussed with AFWA on multiple occasions, no specific opportunities were identified. The Executive Board will continue to seek opportunities to advance this priority.
4. Aquatic Invasive Species committee will identify needs and provide recommendations to the Executive Board for promoting streamlining of the Lacey Act Injurious Wildlife Listing process and for establishing a federal screening process to evaluate risk of non-native species prior to importation.
   - This priority was discussed during AIS Committee meetings in September 2022 and July 2023.
   - *On-going*: The AIS committee recommended new Lacey Act related priorities for the 2024-2028 priorities document to continue this work.
5. Promote development of consistent basin-wide regulatory approaches for the management of AIS.
   a) Executive Board will facilitate meetings and discussions with the diploid grass carp states, as needed, to establish regulatory consistency for grass carp as recommended in the February 2015 MICRA Grass Carp Report.
      - Arkansas, Colorado, and Missouri changed their rules and regulations during the operational period to require triploid grass carp to be stocked.
      - The Executive Board has not organized a meeting of the diploid grass carp states since 2017.

   b) Aquatic Invasive Species Committee will coordinate efforts to implement recommendations in the February 2015 MICRA

Grass Carp Report.

- *On-going*: The newly formed MICRA AIS Committee and the MRBP Prevention and Control Committee have this on their work plans for 2024 and will coordinate on implementation.
- *On-going*: A review of the recommendations in the February 2015 MICRA Grass Carp Report is scheduled for meetings with the ANS Task Force and leadership of the six regional advisory panels in January 2024.

6. MICRA Aquatic Invasive Species Committee will review and make recommendations for revising the MICRA AIS Action Plan so that it remains a relevant outreach tool.
   - This priority was discussed during AIS Committee meetings in September 2022 and July 2023.
   - *On-going*: The AIS Committee will address this priority during the next 5-year operational period.
7. Support efforts to prevent the exchange of AIS between the Great Lakes and Mississippi River basins.
   - MICRA submitted a comment letter in February 2019 to "support USACE's efforts to prevent the transfer of ANS from the Mississippi River Basin to the Great Lakes River Basin when designed and implemented as a part of a comprehensive alternative of control actions and technologies to achieve the overall GLMRIS goal of preventing the transfer of ANS in both directions between the two basins".
   - MICRA participated as a member of the Chicago Area Waterway System Aquatic Invasive Species Stakeholder Group until it was dissolved in 2022. This diverse stakeholder group worked to reach consensus on a set of recommendations to elected and appointed local, state, and federal officials and to the public on short and long-term measures to prevent Asian carp and other aquatic invasive species (AIS) from moving between the Mississippi River and Great Lakes basins through the Chicago Area Waterway System.
   - DC Fly-in ~~talking points~~(2019-2023) member delegates conveyed the need~~included in a recommendation~~ to ~~"~~direct and fund USACE ~~($500k)~~, through appropriations and WRDA, to complete a feasibility study to prevent two-way transfer of ANS, initiated with the Great Lakes and Mississippi River Interbasin Study (GLMRIS)~~"~~.

Specifically, to initiate the scoping phase for a Feasibility Study to prevent downstream transfer of ANS.

- DC Fly-in February 2020 included a meeting with USACE leadership to discuss (among other topics) the Mississippi River Basin states' concern with the continued lack of action to prevent the downstream transfer of ANS from the Great Lakes to the Mississippi River Basin as directed by Congress through the GLMRIS authorization.

8. Coordinate efforts to prevent introductions, stop the continued spread, and control established populations of Asian carp in the basin.

    - MICRA and the Great Lakes St. Lawrence Governors and Premiers held an Invasive Carp Summit in January 2020 to discuss regional coordination of regulatory, management, and research programs regarding invasive carp.

        a) Promote the need to expand the scope of federal agencies' Asian carp activities to include the entire Mississippi River Basin and the need for federal funding to facilitate implementation of the Mississippi River Basin Asian Carp Control Strategy Frameworks in support of the national 'Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States'.

            - This topic was included as a discussion topic with Federal agencies and Congressional offices during MICRA's 2019 Fly-in.
            - In coordination with Mississippi Senator Cindy Hyde-Smith, MICRA hosted a Congressional staff briefing in May 2019 to discuss invasive carp management and control in the Mississippi River Basin.
            - All six sub-basins were specified in the 2020 WRDA bill and all sis sub-basins have been specified in appropriations bills since FY2020.
            - USFWS funding for implementation of the national invasive carp management and control plan in the Mississippi River Basin increased from $7,000,000 for work in the Upper Mississippi River (UMR) and Ohio River (OHR) sub-basins in FY2018 to $31,000,000 for work in all six sub-basins in FY2023. In FY2018, the USFWS provided a total of

$2,200,000 in financial assistance to MICRA member states in the UMR and OHR sub-basins to support framework implementation. In FY 2023, the USFWS provided more than $18,600,000 in financial assistance to MICRA member states in all 6 sub-basins to support framework implementation.

b) Coordinate ~~basinwide~~basin-wide efforts to develop sub-basin Asian Carp Control Strategy Frameworks, including Action Plans for implementation.

- Asian Carp Control Strategy Frameworks have been developed for all six sub-basins and are posted on the MICRA website: http://micrarivers.org/invasive-carp-plans-and-reports/.
- The sub-basin partnerships developed annual project proposals and implemented work plans to collaboratively implement their respective sub-basin Frameworks.
- Sub-basin partnerships were not requested to develop action plans for implementing their respective sub-basin frameworks.
- *On-going*: The Executive Board requested the sub-basin partnerships each develop sub-basin scale objectives in support of their respective sub-basin Frameworks.

c) In partnership with USFWS, coordinate the collaborative development of an annual Monitoring and Response Plan to identify highest priority management actions for Asian Carp in the Mississippi River Basin each year.

- MICRA works with the USFWS sub-basin invasive carp partnership coordinators each year to develop an annual Monitoring and Response Plan for the Mississippi River Basin and posts the document on the MICRA website.

d) Coordinate the collaborative development, prioritization, and submission of annual recommendations to USFWS for federal funding assistance to implement sub-basin Asian Carp Control Strategy Frameworks.

- MICRA works with the USFWS sub-basin invasive carp partnership coordinators each year to compile project proposals from all sub-basin partnerships.

- The compiled project proposals are reviewed by the MICRA Invasive Carp Advisory Committee and a ~~basinwide~~basin-wide recommendation is submitted to the USFWS by the MICRA Chairman each year for funding consideration.

e) Aquatic Invasive Species Committee will provide recommendations to the Executive Board for standardized methods for collecting and reporting population data for Asian carp species.

- The AIS Committee was not asked to address this priority as it is being considered by the revised ICAC.

f) Aquatic Invasive Species Committee will provide recommendations to the Executive Board for documenting and reporting harvest data for Asian carp species.

- The AIS Committee was not asked to address this priority as it is being considered by the revised ICAC.

g) Promote consistent outreach materials and messages throughout the Mississippi River Basin.

- MICRA works with the USFWS sub-basin invasive carp partnership coordinators to develop similar documents each year for the Monitoring and Response Plan for ~~basinwide~~basin-wide consistency.
- Annual summary reports for projects implemented under the Monitoring and Response Plan are compiled and posted on the MICRA website.
- Documents are posted on the MICRA website to provide ~~basinwide~~basin-wide and national information on implementation of the national management and control plan.

Objective 4: Develop and implement a communication plan for disseminating information to target audiences.

Priorities:

1. Work with outreach specialists from member and entity agencies to draft, finalize, and implement a MICRA communications plan.
   - Development of a MICRA communications plan was postponed

while MICRA worked on the Joint Strategic Plan and Mississippi River Basin Fishery Commission initiative.

2. Executive Board and committees will maintain current content on the MICRA website.
    - MICRA continues to maintain the MICRArivers.org website.
    - The Executive Board requested all standing committees to review their respective pages on the website and develop content as needed.
3. Engage in efforts to increase awareness and action of Congressional members to improve management of fishery and aquatic resources in the Mississippi River Basin.
    - MICRA contracted for Policy and Government Affairs service annually from 2019-2023.
    - MICRA organized a Fly-in to Capitol Hill annually from 2019-2023. The 2021 Fly-in was conducted remotely due to the COVID-19 pandemic
    - In coordination with Senator Cindy Hyde-Smith, MICRA hosted a Congressional staff briefing on Invasive Carp Management and Control in the Mississippi River Basin in May 2019, in Washington DC.
    - MICRA participated in a Congressional staff briefing July 22, 2019, hosted by the National Marine Manufacturers Association (NMMA) and the Congressional Boating Caucus, to examine the environmental and economic problems created by aquatic invasive species.
    - MICRA hosted a Congressional field visit August 25-26, 2021, at Pickwick Dam on the Tennessee River.
    - MICRA partnered with the U.S. Army Corp of Engineers (USACE) and the Upper Mississippi River Basin Association (UMRBA) to host a Congressional field visit in conjunction with a USACE Science Team Open House at Lock and Dam 22 on the Mississippi River October 12, 2022, to discuss the significance of large-scale habitat restoration and connectivity projects; project monitoring and evaluation; and collaborative, multi-agency approaches to interjurisdictional fisheries management.
    - MICRA partnered with the Upper Mississippi River Basin

Association (UMBRA) to host a Congressional field visit August 8, 2023, in La Crosse, Wisconsin.

- MICRA partnered with Senator Wicker to host a Congressional briefing with Senate staff in November 8, 2023, in Washington, DC.

4. Develop outreach materials, information brochures and short publications on issues of concern to fishery resource management in the Mississippi River Basin as needed.
   - The Executive Board will develop sub-basin fact sheets based on the Aquatic Habitat Action Plan during the next operational period.
5. Develop a 5-year report of activities, accomplishments, and remaining resource needs identified in the MICRA priorities document.
   - This appendix was developed to provide a summary of activities, accomplishments, and unaddressed priorities for 2019-2023.
6. Host workshops and networking opportunities at national and regional professional meeting (e.g., Midwest Fish & Wildlife Conference, SEAFWA, AFS Parent Society meetings) for MICRA member agency delegates, committee members, and partners.
   - COVID-19 limited opportunities for workshop and networking opportunities during much of this 5-year operational period.
   - An informal mixer was hosted in conjunction with a joint MICRA and Great Lakes St. Lawrence Governors and Premiers Invasive Carp Summit and MICRA Executive Board meeting in January 2020.
   - The Executive Board hosted a MICRA social following the All-Delegates meeting August 21, 2023, in Grand Rapids, MI.

Objective 5: Secure funding for long-term operational needs and implementation of basin-wide programs.

Priorities:

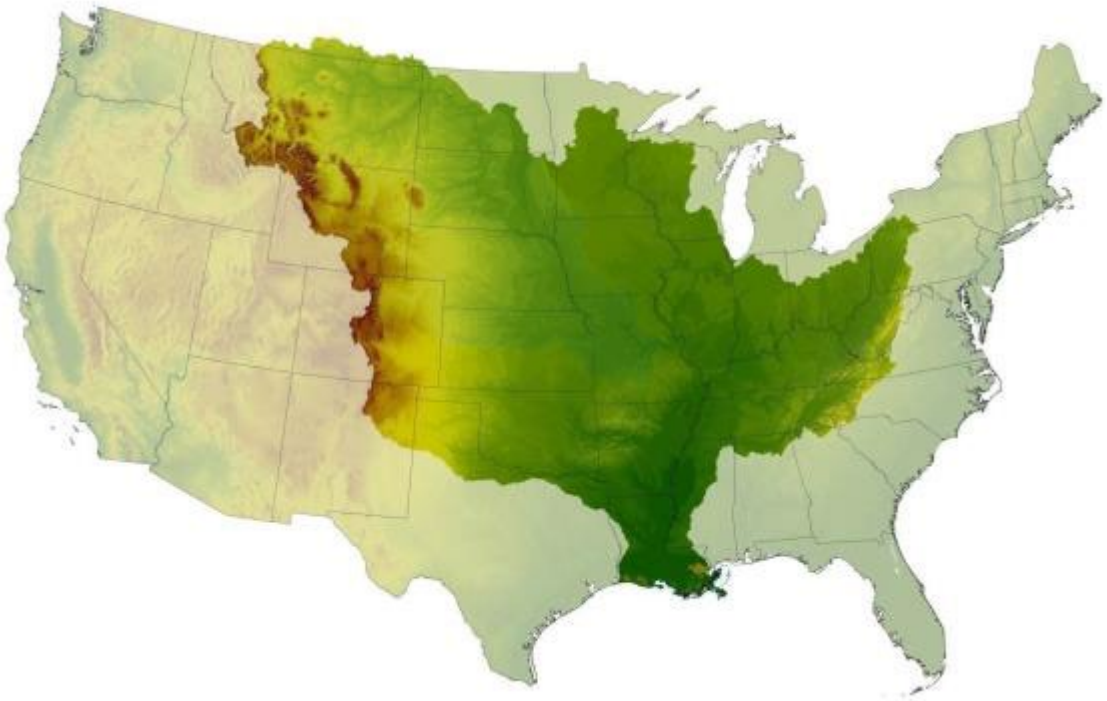
1. Pursue reliable, long-term funding sources and mechanisms for MICRA.
   - MICRA's Mississippi River Basin Fishery Commission initiative is intended to result in an authorization and appropriation of Federal funding to support the states' efforts to collaboratively manage sustainable interjurisdictional fishery resources.

- MICRA's sustained Congressional outreach efforts have resulted in
    - Increases in U.S. Fish and Wildlife Service (USFWS) grant funding for implementation of ANS Task Force approved state/interstate AIS management plans from $2,000,000 in FY18 to greater than $4,000,000 in FY2023.
    - WRDA 2020 language directing an expansion of the U.S. Fish and Wildlife Service led multi-agency effort from the "Upper Mississippi and Ohio River basins and tributaries" to the "Mississippi River and tributaries, including the 6 sub-basins of the River."
    - Invasive carp funding increases to the USFWS to support states' collaborative efforts to manage and control invasive carp populations in the Mississippi River Basin. Funding to states increased from $2,200,000 in FY2018 to more than $18,600,000 in FY2023.
    - WRDA 2020 authorizations for $25,000,000 for a pilot invasive carp deterrence program in the Tennessee and Cumberland Rivers Sub-basin. WRDA 2022 included direction for at least one deterrence project in the Tennessee-Tombigbee Waterway.
    - WRDA 2020 language authorizing of $4,000,000 for each of fiscal years 2021 through 2025 for a USFWS invasive carp eradication program to provide financial assistance to states to implement measures necessary to eradicate invasive carp. No funding for this program has been appropriated through FY2023.

2. Work with MICRA member agencies to pursue formation of a congressionally funded Mississippi River Basin Fishery Commission to coordinate fisheries research, control aquatic invasive species (e.g., Asian carps), and facilitate cooperative management of interjurisdictional fishery and aquatic resources among the state, tribal, and federal management agencies.
    - MICRA completed the collaborative development of '*A Joint Strategic Plan for Management of Mississippi River Basin Fisheries*' in February 2021.
    - Agency Directors from 26 of MICRA's 28 member states have signed a Memorandum of Acceptance of the Joint Strategic Plan.

- MICRA briefed the AFWA Fisheries and Water Resources Policy Committee and the AFWA Invasive Species Committees on the MICRA Joint Strategic Plan and Mississippi River Basin Fishery Commission in September 2019 and March 2023.
- MICRA briefed the MAFWA Directors on the MICRA Joint Strategic Plan and Mississippi River Basin Fishery Commission in June 2023.
- MICRA briefed the SEAFWA Fisheries Resources Committee and Directors Committee on the MICRA Joint Strategic Plan and Mississippi River Basin Fishery Commission in October 2023.
- MICRA has contracted for policy and government affairs services to assist MICRA with the Mississippi River Basin Fishery Commission.
- MICRA funded the development of coalition website in support of the proposed Mississippi River Basin Commission. The website is under development at the end of 2023.

AQUATIC HABITAT ACTION PLAN FOR NATIVE INTERJURISDICTIONAL FISH OF THE MISSISSIPPI RIVER BASIN



Mississippi Interstate Cooperative Resource Association

www.MICRArivers.org

August 2023

Acknowledgements

The MICRA Executive Board would like to acknowledge the work of the MICRA Habitat Committee in preparing the *Aquatic Habitat Action Plan for Native Interjurisdictional Fish of the Mississippi River Basin*. The MICRA Executive Board members provided the Habitat Committee with draft sections and guidance for producing the final document. The information presented in this document represents the contributions of biologists from several fish and wildlife management agencies throughout the Mississippi River Basin, including several that were not members of the Habitat Committee. Special recognition is given to Jeff Janvrin, Wisconsin Department of Natural Resources, and Joseph Zimmerman, Kentucky Department of Fish and Wildlife Resources for their work as co-chairs of the MICRA Habitat Committee and for coordinating the development of this document. Angela Erves, U.S. Fish and Wildlife Service, assisted the Executive Board with GIS-based revisions to MICRA's list of 6th order and larger interjurisdictional rivers in the Mississippi River Basin. Jeff Janvrin and Angela Erves develop the GIS-based maps presented throughout this document.

MICRA Habitat Committee members and other contributors included:

Jeff Janvrin[1] – Wisconsin Department of Natural Resources
Joseph Zimmerman[1] – Kentucky Department of Fish and Wildlife Resources
Butch Atwood – Illinois Department of Natural Resources
Nathan Aycock – Mississippi Department of Wildlife, Fisheries & Parks
Tim Bister – Texas Parks and Wildlife Department
David Breth – Kansas Department of Wildlife, Parks and Tourism
Tim Broadbent – Tennessee Wildlife Resources Agency
Brandon Brown – Oklahoma Department of Wildlife Conservation
Mike Clancy – New York Department of Environmental Conservation
Harry Crockett – Colorado Parks and Wildlife
Jim Darling – Montana Fish, Wildlife & Parks
Dan Dieterman – Minnesota Department of Natural Resources
Phil Ekema – Alabama Department of Conservation and Natural Resources
Angela Erves – U.S. Fish and Wildlife Service
Jeff Garner – Alabama Department of Conservation and Natural Resources
Jessica Hogrefe – U.S. Fish and Wildlife Service
Doug Keller – Indiana Department of Natural Resources
Scott Loftis – North Carolina Wildlife Resources Commission
Chris Longhenry – South Dakota Game, Fish & Parks Department
Rob Maher – Illinois Department of Natural Resources
Robby Maxwell – Louisiana Department of Wildlife and Fisheries
Joe McMullen – Missouri Department of Conservation
Gerald Mestl – Nebraska Game & Parks Commission
Chris O'Bara – West Virginia Division of Natural Resources
Chris Racey – Arkansas Game and Fish Commission
Bobby Reed – Louisiana Department of Wildlife and Fisheries
Scott Robinson – Georgia Department of Natural Resources
Jeff Schmid – Pennsylvania Fish and Boat Commission
George Scholten – Iowa Department of Natural Resources
Brandon Simcox – Tennessee Wildlife Resources Agency
Kasey Whiteman – Missouri Department of Conservation

[1] Co-chairs of the MICRA Habitat Committee

Lynn Wright – Texas Parks and Wildlife Department

Table of Contents

AQUATIC HABITAT ACTION PLAN FOR NATIVE INTERJURISDICTIONAL FISH OF THE MISSISSIPPI RIVER BASIN

Mississippi Interstate Cooperative Resource Association

Introduction

The waters of the Mississippi River Basin (Basin) contribute more than $19 billion of recreational fishing value annually (USFWS, unpublished data). This economic value is generated, in part, from a variety of species that, during some part of their life cycle, utilize rivers of the Basin managed by two or more governmental or tribal agencies. These species are referred to as "interjurisdictional fish" due to the cooperation necessary at multi-governmental levels to sustain their populations and habitat.

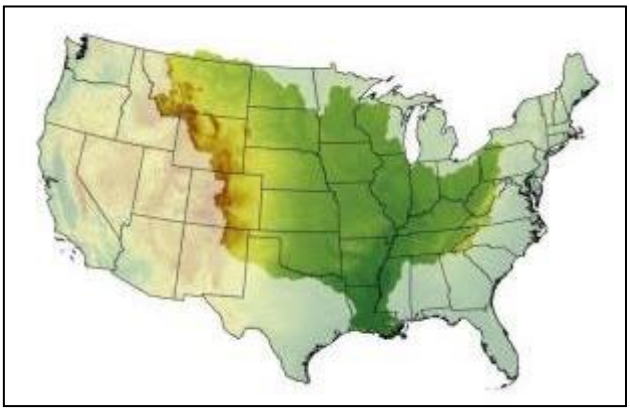


Figure 1. The Mississippi River Basin, or watershed, includes rivers and lakes from 31 states.

Interjurisdictional fish are often dependent on unique habitat types within these rivers and access to these habitats. Human actions have altered habitat quality and availability throughout the Basin due to construction of dams, impacts of sedimentation from the watershed, pollution and other factors. While many of these actions have led to losses of habitat for some species some actions have led to benefits for other species. For example, dams that create large reservoirs have been shown to negatively impact paddlefish and sturgeon populations (Cooke, D.W. and S. D. Leach 2004, Zigler et al.2004, Firehammer and Scarnecchia 2006.) while other recreational species often become abundant within the lakes created by these dams (Miranda 1999, Cameron et al. 2006). Unfortunately, there are many examples of where the reservoirs created have become less productive overtime due to sedimentation, fluctuating water levels or poor water quality (Miranda et al. 2010).

Management and protection of habitat for interjurisdictional fisheries' resources is dependent on actions that are achieved through a variety of governmental entities. Likewise, habitat protection, enhancement and restoration require financial contributions from a variety of local, state and federal sources. Within the Basin, there are numerous examples of how the combined efforts of local, state and federal partnership projects have resulted in protection or restoration of critical habitat for interjurisdictional fish. These examples show what is possible, but cumulatively they have affected <1% of the total interjurisdictional river miles within the Basin.

More work is needed to protect existing quality habitat and to enhance/restore once productive habitats within the Basin for interjurisdictional fish. Many of the Basin's interjurisdictional rivers

have existing authorities though which work can be done if funding were increased to authorized levels. However, there are still many rivers and reservoirs where new funding sources or authorities are needed to address human caused impacts to fisheries habitat.

MICRA members continue to observe an overall decline in habitat quality throughout the basin, which will eventually lead to a reduction in populations of some interjurisdictional fish species and their associated recreational and commercial value to the economy. Additionally, many threatened and endangered species will be negatively impacted if habitat protection and restoration actions do not increase for the rivers and reservoirs.

Figure 2. Paddlefish collected from the Mississippi River Basin.

Goals:

1. Conserve and protect high quality aquatic habitats in the Mississippi River Basin
2. Restore and create aquatic habitats and system functions in the basin

Priority Needs with Recommended Management Strategies:

A. Maintain and enhance high quality habitats and habitat diversity
   - Avoid and minimize degradation of aquatic habitats through best management practices for watershed management, shoreline stabilization, channel training structure modifications, and acquisition of land/easements from willing private landowners.
   - Enhance and restore secondary channels, off-channel aquatic areas, and other critical habitats (e.g., crossovers; riffle pools; mussel beds; isolated wetlands; spawning, nursery, and over-winter habitat; etc.) requiring special protection or acquisition to increase habitat diversity.

B. Manage sediment transport
   - Support watershed initiatives to reduce/eliminate watershed induced degradation of aquatic habitats and ecosystem functions.
   - Promote restoration of a sediment transport regime such that transport, deposition, and erosion rates are within acceptable limits.

C. Restore main stem and tributary hydrology
   - Implement changes to dam operating procedures and water level management techniques that facilitate more natural hydrographs (i.e., reduced daily fluctuations).
   - Develop and implement watershed management actions to facilitate more natural hydrographs.
   - Restore hydraulic and habitat connectivity

D. Restore hydraulic and habitat connectivity
   - Enhance lateral connectivity to the current and historic floodplain using a variety of techniques on publicly-owned properties and willing private ownerships.
   - Increase longitudinal migration opportunities for fish through changes in dam operations and fish passage structures at dams and other human induced barriers.

E. Restore floodplain geomorphology/landforms
   - Restore or construct floodplain landforms (e.g., islands, seed islands, chevrons, reefs, etc.) in locations where floodplain structural diversity is needed to increase variability in flow patterns, sediment composition, bathymetry, and reductions in wind fetch.
   - Increase the area of naturally functioning floodplain through acquisition and restoration of bottomland hardwoods, wetlands, and other floodplain habitat.

Literature Cited

Cameron, B., G. Spacie, and A. Spacie. 2006. Changes in Fish Assemblage Structure Upstream of Impoundments within the Upper Wabash River Basin, Indiana, Transactions of the American Fisheries Society, 135:3, 570-583, DOI: 10.1577/T05- 031.1

Cooke, D.W. and S. D. Leach. 2004. Implications of a Migration Impediment on Shortnose Sturgeon Spawning, North American Journal of Fisheries Management, 24:4, 1460-1468, DOI: 10.1577/M03-141.1

Firehammer, J.A., and D. L. Scarnecchia. 2006. Spring Migratory Movements by Paddlefish in Natural and Regulated River Segments of the Missouri and Yellowstone Rivers, North Dakota and Montana, Transactions of the American Fisheries Society, 135:1, 200-217, DOI: 10.1577/T05-058.1

Miranda, L.E. 1999. A Typology of Fisheries in Large Reservoirs of the United States, North American Journal of Fisheries Management, 19:2, 536-550, DOI: 10.1577/1548-8675(1999)019<0536:ATOFIL>2.0.CO;2

Miranda, L. E., M. Spickard, T. Dunn, K. M. Webb, J. N. Aycock, and K. Hunt. 2010. Fish Habitat Degradation in U.S. Reservoirs, Fisheries, 35:4, 175-184, DOI:10.1577/1548-8446-35.4.175

U.S. Fish and Wildlife Service. 2011. Unpublished data.

Zigler, S. J., M. R. Dewey, B. C. Knights, A. L. Runstrom, and M. T. Steingraeber. 2004. Hydrologic and Hydraulic Factors Affecting Passage of Paddlefish through Dams in the Upper Mississippi River, Transactions of the American Fisheries Society, 133:1, 160- 172, DOI: 10.1577/T02-161

Arkansas-Red-White Rivers Sub-Basin

Mississippi Interstate Cooperative Resource Association

Geography

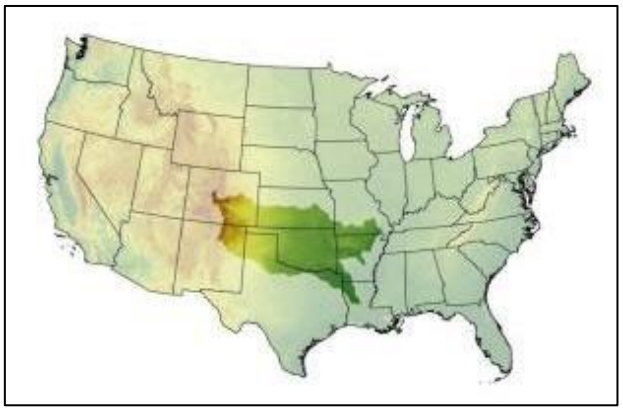


Figure 3. The Arkansas-Red-White Rivers Sub-Basin, or watershed, includes rivers and lakes from 8 states.

The Arkansas-Red-White Rivers sub- basin of the Mississippi River Basin is an ecologically important and diverse area incorporating the Arkansas River, Red River, White River, and their corresponding tributaries within the states of Colorado, New Mexico, Kansas, Oklahoma, Texas, Missouri, Arkansas, and Louisiana. At 1,469 miles, the Arkansas River is the sixth longest river in the United States, and its drainage basin covers nearly 170,000 square miles. The White River is 722 miles long and has a watershed of nearly 28,000 square miles. The Red River is 1,360 miles long and has a watershed of almost 66,000 square miles. These three rivers, along with dozens of major and minor tributaries and reservoirs, are home to hundreds of native fish and mussel species.

Economics

Fishing is an important recreational activity within the Arkansas-Red-White Rivers sub-basin, with more than 1,561,807 anglers annually generating $2,270.8 in revenue. Commercial fishing and musseling are also economically significant within the sub-basin. Ten endangered fish and mussel species are found in the rivers and streams of the Arkansas-Red-White Rivers sub-basin. The Aquatic Habitat Action Plan for the Arkansas-Red-White Rivers sub-basin is designed to improve aquatic habitat for these ecologically and economically important fish and mussel species.

In 1994, five lock and dam structures were completed on the Louisiana portion of the Red River to promote transportation and associated economic development. This transformed the lower Red River into a series of five “pools.” Barge traffic on the river is light, with an average of 3.8 daily openings of Lock and Dam #2 between 2010 and 2018.

Problem Statement/Greatest Needs

Habitat within the sub-basin’s rivers is often highly altered and can be limiting for aquatic species. Aquatic habitat enhancement within the Arkansas-Red-White Rivers sub-basin is critical to maintaining and restoring fish and mussel diversity and populations.

Existing Partnerships/Plans

Arkansas Stream Heritage Partnership (ASHP)

The ASHP was established in 2017 to restore the natural free-flowing heritage of Arkansas streams, opportunistically, and efficiently. The partnership is a consortium of federal, state, and NGO partners working to foster the development of a network and process for supporting, aiding, and implementing the removal of barriers to stream connectivity, thereby restoring hydrologic, biologic, and ecologic function in an opportunistic, non-regulatory, and efficient manner. The partnership has already assisted with several barrier removals and crossing improvements, with more in the works for 2022.

Red River Waterway Project (RRWP)

The RRWP was authorized by Congress in 1968, and five locks and dams were completed in 1994 ensuring the navigability of the Red River from Shreveport to the Mississippi River. Three additional lock and dam structures have been proposed – one in Louisiana north of Shreveport, and two in Arkansas.

Red River Waterway Commission (RRWC)

The RRWC is a political subdivision of the State of Louisiana created following the 1968 authorization of the RRWP. The RRWC is tasked with fostering economic growth and recreational opportunities in the seven parishes along the Louisiana portion of the Red River. Commission members are appointed from each of the seven parishes along with four at-large commissioners.

Red River Compact Commission (RRCC)

Negotiations on the RRCC were authorized by Congress in 1955, and the Compact was signed by member states Oklahoma, Texas, Arkansas, and Louisiana in 1978. The purpose of the RRCC is to resolve and prevent disputes over issues regarding interstate waters. Provisions of the compacts specify how much water each member state is allowed to develop and store in the system. In recent years, water quality and pollution issues have received increased attention from member commissions. The RRCC consists of nine members -- two from each of the four states, and one federal representative appointed by the President.

Red River Valley Association (RRVA)

The RRVA was founded in 1925 as a non-profit member-supported organization. The RRVA works on local, state, and federal levels to promote the economic development and well-being of citizens along the Red River waterway in Oklahoma, Texas, Arkansas, and Louisiana.

Examples of Completed Habitat Restoration

Past experience with restoration projects within the Arkansas-Red-White Rivers sub-basin provide examples of what can be accomplished with increased funding and both existing and new authorities. Natural flow regimes have been restored in parts of the Big Cypress Bayou

downstream of Lake O' the Pines (Smith et al. 2019). Research and evaluation of flows began in 2004. In 2011, USACE and the North East Texas Municipal Water District (NETMWD) agreed to implement the key recommendations of the stakeholders for the flow regime. They intend to release water from Lake O' the Pines for the next five years to provide base flows and certain pulses while the stakeholders monitor the results. The pulses include flows needed for paddlefish spawning. Stakeholders include the Caddo Lake Institute, The Nature Conservancy, USACE, USFWS, NETMWD, USGS, Texas Parks and Wildlife Department, Texas Commission on Environmental Quality, Louisiana Department of Wildlife and Fisheries, Cypress Valley Navigation District, the City of Jefferson, and others.

Spawning habitat for paddlefish and other native fish has been enhanced through the construction of a 1,500-foot-long gravel shoal in the Big Cypress Bayou between Lake O' the Pines and Caddo Lake.

Management of invasive species through herbicide or biological controls has been implemented at a variety of locations within the sub-basin. From 2015 – 2020, Louisiana and Arkansas treated a combined average of more than 18,313 acres of nuisance aquatic vegetation in the sub-basin.

Implementation Needs

Currently, project funding is a critically limiting factor and a requirement to achieving the Plan's objectives. Even with appropriate project funding, continued partnership by a suite of state and federal agencies, non-governmental organizations, and the public will be necessary for success.

The Aquatic Habitat Action Plan highlights restoration objectives, recommends management strategies, identifies potential management actions, and provides specific project examples that are necessary to maintain and restore fish and mussel diversity within the Arkansas-Red-White Rivers sub-basin. The Plan's objectives are to:

1. Maintain and enhance high quality habitat and habitat diversity,
2. Manage sediment transport,
3. Restore main stem and tributary hydrology,
4. Restore hydraulic and habitat connectivity, and
5. Restore floodplain geomorphology and landforms.

Projects focused on addressing these objectives will improve riverine aquatic habitat. Several examples of projects that could be conducted across the Arkansas-Red-White Rivers sub-basin to improve habitat are provided in the Plan.

The Plan addresses aquatic habitat needs for a variety of recreational, commercial, non-game and threatened or endangered fish and mussel species.

Table 1. Interjurisdictional rivers (6th order and larger) of the Arkansas-Red-White Rivers Sub-basin.

Rivers	Stream Order	States	Tribal
White (including Bull Shoals, Norfork, and Table Rock Reservoirs)	8	AR, MO	
North Fork	6	MO, AR	
Black	7	MO, AR	
Current	6	AR, MO	
Eleven Point	6	AR, MO	
Arkansas	9	CO, KS, OK, AR	x
Salt Fork Arkansas	7	OK, KS	x
Medicine Lodge	6	OK, KS	
Chikaskia	6	OK, KS	x
Cimarron	6	OK, KS, CO	x
Verdigris	7	KS, OK	x
Caney	6	OK, KS	x
Little Caney	6	OK, KS	x
Neosho	7	OK, KS	x
Spring	6	MO, KS, OK	x
Illinois	6	AR, OK	x
Canadian	8	OK, TX, NM	x
North Canadian[1]	7	OK	x
Beaver	6	OK, TX	x
Poteau	6	AR, OK	x
Red	7	LA, AR, OK, TX	x
North Fork Red River	6	OK, TX	
Washita	6	OK, TX	x
Muddy Boggy Creek[1]	6	OK	x
Kiamichi[1]	6	OK	x
Little	6	OK, AR	x
Mountain Fork	6	OK, AR	x
Sulphur	6	AR, TX	
Twelve Mile Bayou[2]	6	LA	
Big Cypress (including Cypress Springs, Lake Bob Sandlin, Lake O' the Pines, and Caddo Lake)	6	TX, LA	
Loggy Bayou[2]	6	LA	
Bayou Dorcheat	6	AR, LA	

[1] North Canadian, Muddy Boggy Creek, and Kiamichi flow through or border tribal lands.

[2] Twelve Mile Bayou and Loggy Bayou are not interjurisdictional rivers but both are formed by interjurisdictional tributaries.

Table 2. Select ecological and economic statistics for the Arkansas-Red-White Rivers Sub-basin.

Arkansas-Red-White Rivers Sub-basin	
Watershed (square miles)	248,000
Number of Interjurisdictional Rivers	13
Number of States in sub-basin	8
Number of Fish/Mussel Species	290/80
Number of Endangered Fish/Mussels	3/10
Recreational Fishery Value (millions)	$2,270.8
Commercial Fishery Harvest (lbs.)	878,261
2011 Commercial Navigation (tons)	10,600

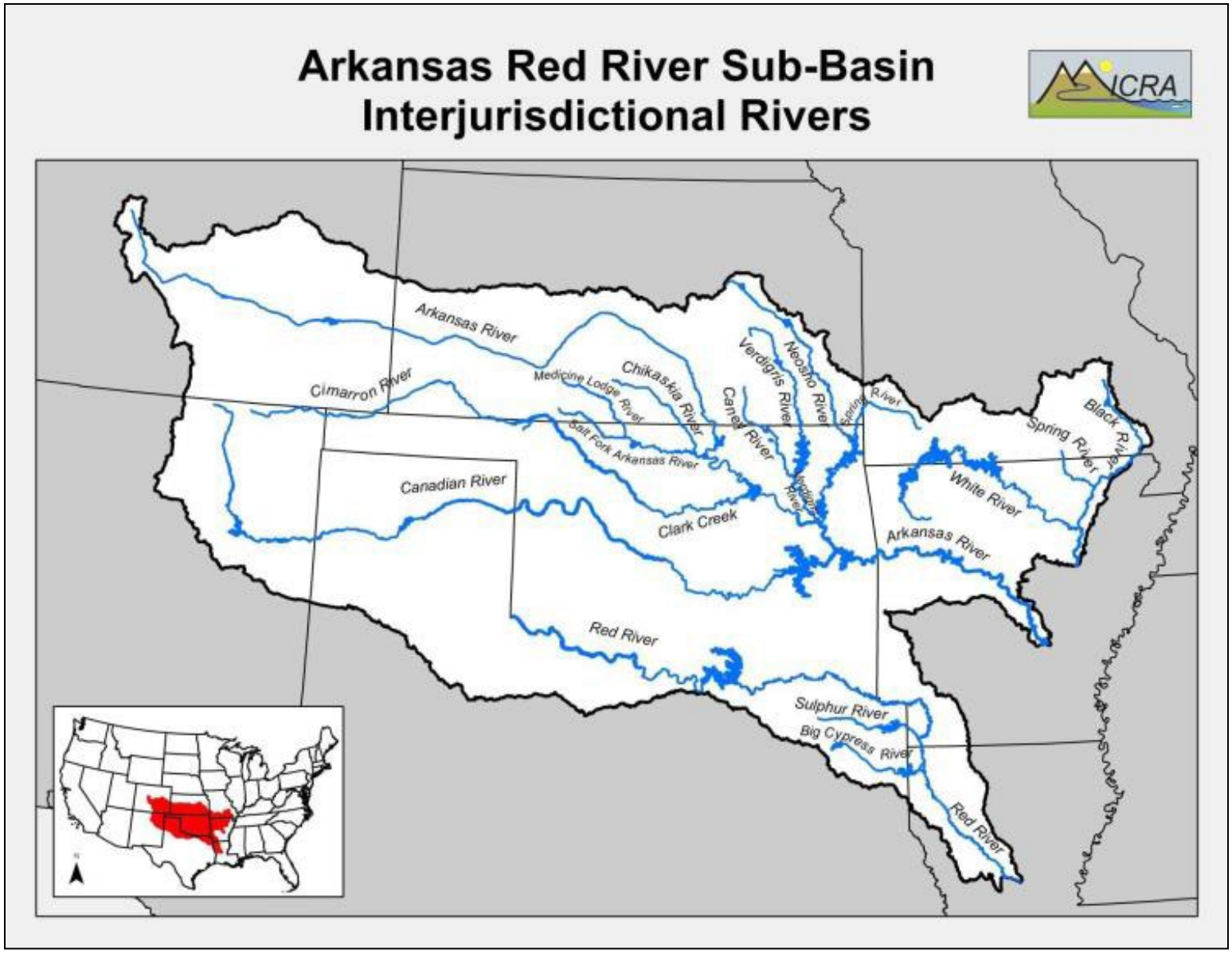


Figure 4. Select 6th order and larger interjurisdictional rivers of the Arkansas-Red-White Rivers Sub-basin.

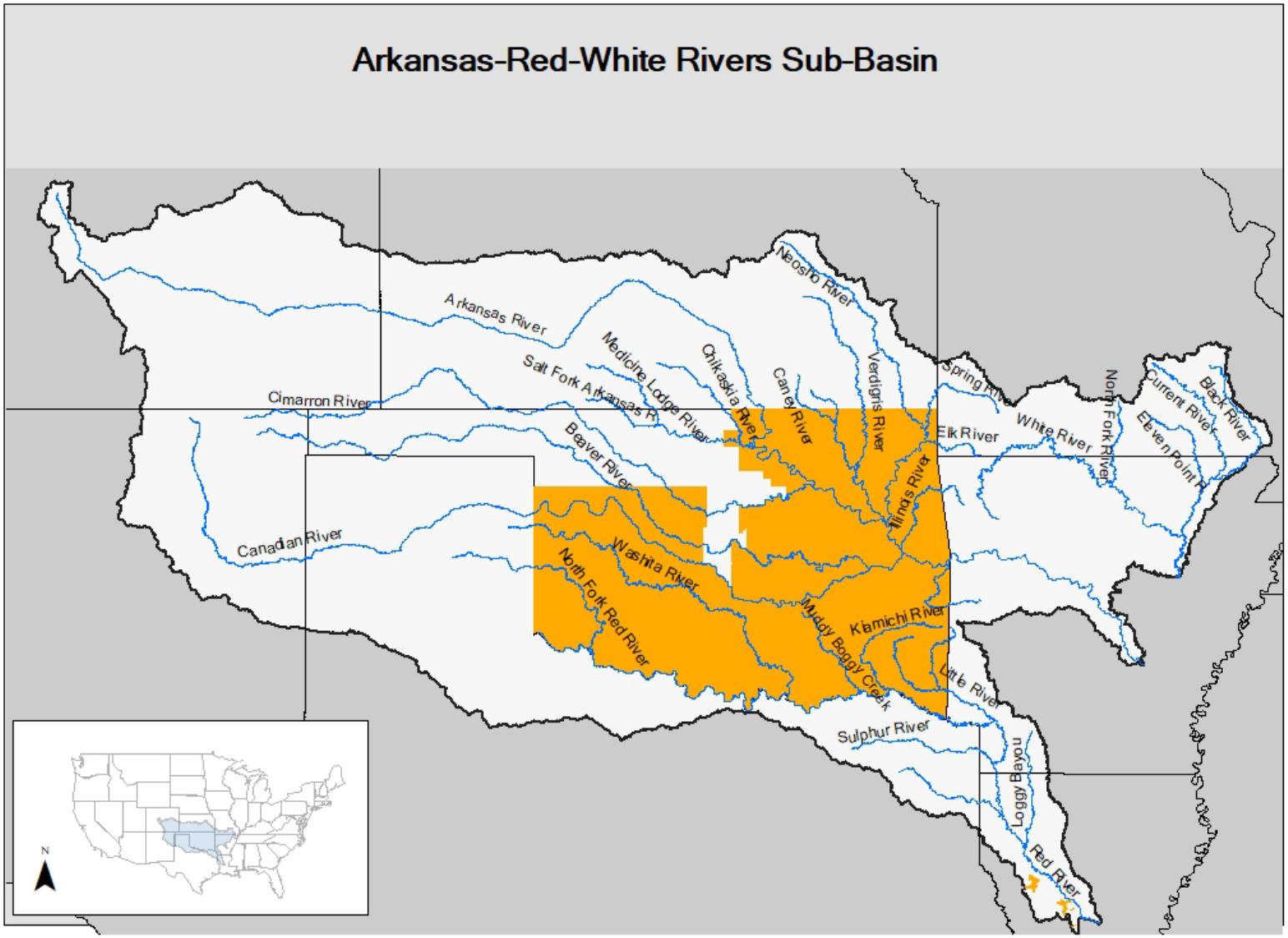


Figure 4. Select 6th order and larger interjurisdictional rivers of the Arkansas-Red-White Rivers Sub-basin. Orange polygons indicate tribal territories.

Literature Cited

Smith, R., J. Trungale, R. Lowerre, T. Hayes, M. Montagne, T. Bister, L.-A. Overdyke, and M. Hackett. 2019. Instream flow restoration and watershed conservation in the Cypress Basin, Texas. American Fisheries Society Symposium 91:345-366.

Lower Mississippi River Sub-Basin

Mississippi Interstate Cooperative Resource Association

Geography

The Lower Mississippi River (LMR) begins at the confluence of the Mississippi and Ohio Rivers in southern Illinois and flows 953.5 miles to the Head of Passes, where the river subdivides into several distributaries to the Gulf of Mexico (USACE 2013, USFWS 2013). The Lower Mississippi River Valley (LMRV) lies within the Central Gulf Coastal Plain physiographic province (Baker et al. 1991, USACE 2013). The LMRV varies in width between 40 and 110miles and includes parts of the states of Missouri, Illinois, Tennessee, Kentucky, Arkansas, Mississippi, and Louisiana.

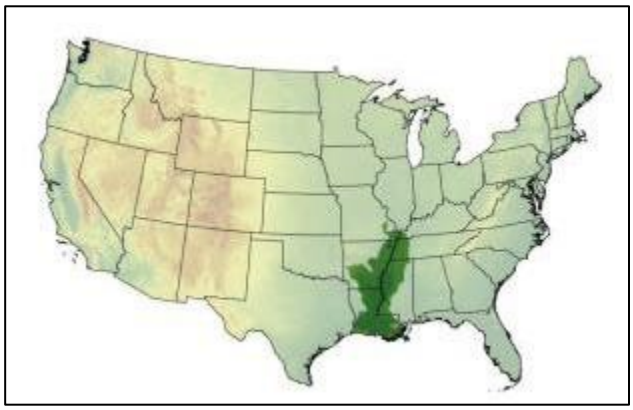


Figure 5. The Lower Mississippi River Sub-Basin, or watershed, includes rivers and lakes from 6 states.

Major tributaries to the LMR include the St. Francis River, Arkansas River, Yazoo River, and Red River. Major distributaries include the Atchafalaya River. Although the historic floodplain of the LMR has been reduced by the construction of the levee system, the system remains unimpounded and the active floodplain currently consists of 2.25 million acres and remains a vitally important ecosystem.

Economics

A recent study (Industrial Economics 2014) examined economic sectors associated with the Lower Mississippi River and reported annual revenues of $151.7 billion and over 585,000 jobs. Sectors examined included: harvest of natural resources, outdoor recreation, tourism, water supply, agriculture and aquaculture, mineral resources, energy, navigation and manufacturing. Of the examined sectors, tourism and outdoor recreation were associated with 11% of total annual revenues and 42% of total employment.

Annually, LMR natural resources produces revenues of $559 million, employs 13,000 individuals, and provide over 375 million cubic feet of timber products, almost 20 million pounds of freshwater fish, and over 1 billion pounds of seafood. Outdoor recreation activities, such as fishing, hunting, and wildlife watching, attract 38 million trips that generate $1.3 billion in expenditures and provide jobs for over 54,000 people. The tourist sector in the LMR corridor generates $15.5 billion in annual expenditures, making it the second largest sector after manufacturing in the region. Tourism is estimated to provide employment to 190,000 workers (Industrial Economics 2014).

Greatest Needs/Problem Statements

In response to the 1927 flood, the U.S. Army Corps of Engineers initiated the Mississippi River and Tributaries (MR&T) project, which consists of levees, revetments, flood storage reservoirs, and floodways to reduce flood risk, as well as dikes, and other river training structures in the channel to facilitate low-water navigation by towboats. Construction of the MR&T project, which still continues today, has resulted in one of the most highly engineered large river channels on the planet (USACE 2013).

The construction of the Mississippi River levee system has significantly altered the LMR habitat in a variety of ways. Levee construction has reduced the floodplain of the river by over 80% (Baker et al. 1991), channel meandering has been eliminated by revetments, channel cutoffs have significantly altered the energy in the system, and channel engineering for navigation has resulted in a gradual but significant loss of secondary channel habitat in the LMR.

Existing Partnerships/Plans

Lower Mississippi River Conservation Committee (LMRCC)

The Lower Mississippi River does not have a funded restoration program but has relied on unique partnerships and collaboration to accomplish species monitoring and habitat restoration projects. The LMRCC (www.LMRCC.org) was founded in 1994 and is a coalition of 12 state natural resource conservation and environmental quality agencies from the six Lower Mississippi River (LMR) states of Arkansas, Kentucky, Louisiana, Mississippi, Missouri and Tennessee. The LMRCC Executive Committee is comprised of one member from each of the 12 delegate agencies. There are also federal partners, including: U.S. Army Corps of Engineers (USACE), U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), U.S. Environmental Protection Agency (EPA), USFWS, and U.S. Geological Survey (USGS). The USFWS provides a full-time coordinator; LMRCC staff work out of the USFWS's Lower Mississippi River Fish and Wildlife Conservation Office in Mississippi. The LMRCC focuses on habitat restoration, long-term conservation planning, and nature-based economic development.

LMRCC Planning – Restoring America's Greatest River

In 2000, the LMRCC completed the Aquatic Resources Management Plan (ARMP) for the LMR. The ARMP outlines strategies for restoring aquatic resources within the 2.25-million-acre active floodplain from the confluence of the Mississippi and Ohio rivers at Cairo, Illinois, to the Gulf of Mexico. The Mississippi River Conservation Initiative (MRCI) was the implementation phase of the ARMP. From 2001-2004, the LMRCC held state-level planning meetings in each of the six member states to identify projects that would improve aquatic habitat and enhance public access to river habitats. Through these meetings, over 230 restoration projects were identified. The restoration work of the LMRCC was coined "Restoring America's Greatest River" (RAGR) and is based on a unique partnership between the LMRCC, the USACE, and the USFWS. The focus of these proposed projects is not only to enhance LMR habitats, but to restore floodplain hydrology and connectivity between the river and its floodplain.

To better focus LMRCC restoration efforts, a ranking system for the proposed secondary channel work was completed by the USACE Engineer Research and Development Center (ERDC) by establishing a Habitat Quality Index and Economy of Restoration Index that were combined into a Priority Index (Killgore et al. 2012). Projects were ranked according to improvements to habitat quality and cost-effectiveness. This ranking system has been and will continue to be used to guide the selection of future restoration projects for secondary channels.

Implementation of the Restoring America's Greatest River plan began in 2006. To date, the focus has been on rehabilitating secondary channels. Dikes and closure dikes are notched to provide more permanent flow between productive secondary channels and the main channel and to create new secondary channels through existing dike fields. To date, 14 projects have been completed, restoring more than 56 miles of channel habitat and thousands of surrounding acres. USACE Districts have constructed 774 dikes between river miles 212 and 953.5 (up to 2012) and 225 (29%) of these structures have been notched (USACE 2013). These notches increase bathymetric diversity, and therefore habitat, below the dikes (USACE 2013). Notching structures has also been directed to enhance secondary channels.

In addition to completing secondary channel projects, the LMRCC has worked in the river floodplain. An example is a project to restore a weir at Lake Perry Martin in Mississippi. The project permanently raised lake water levels, improved water quality, increased fish access and created better public fishing opportunities. Combining the habitat restoration accomplishments of the LMRCC, USACE and other agencies, 76 of the original projects (30%) are in some stage of completion.

Lower Mississippi River Reforestation

The NRCS has identified the Mississippi River basin as a top priority because of water quality concerns (i.e., nutrient loading), and subsequently implemented the Mississippi River Basin Healthy Watersheds Initiative (MRBI). As part of the MRBI, the Batture Reforestation Project was initiated in 2012 to restore wetlands and forests within the active floodplain (i.e., batture) of the LMR. The LMRCC, nonprofit Mississippi River Trust, and the NRCS work in partnership to identify flood-prone cleared land in the Lower Mississippi River active floodplain that landowners desire to reforest through Wetland Reserve Easements. Funding is provided by the NRCS, along with the Walton Family Foundation, and the U.S. Endowment for Forestry and Communities. By late 2014, 58 properties covering 12,059 acres had been enrolled in the program.

Lower Mississippi River Resource Assessment (LMRRA)

The Lower Mississippi River Resource Assessment (LMRRA) was authorized by the Water Resources Development Act (WRDA) of 2000 and is the region's first comprehensive natural resources study since the Lower Mississippi Region Comprehensive Study (Lower Mississippi Region Comprehensive Study Coordinating Committee 1974). The LMRAA will identify information needed for river-related management, natural resource habitat needs, and river-related recreation and access needs. The project area includes the entire LMR, the Atchafalaya

River, and extends into some of the navigable tributaries of the LMR. This project assesses available information and will make recommendations for improvement. This study began in 2012. Partners include the USACE districts in Memphis, Vicksburg, and New Orleans; LMRCC; The Nature Conservancy; National Audubon Society; Mississippi River Corridor-Tennessee; Wildlife Mississippi; Delta Wildlife; and Quapaw Canoe Company.

Lower Mississippi River Conservation Plans

The USFWS produced a Strategic Habitat Conservation Plan (USFWS 2012) for the Lower Mississippi river that outlined a framework for the USFWS vision, partnership and involvement in efforts to conserve endangered species and their habitats. The USACE took this information and produced a Conservation Plan for the Interior Least Tern, Pallid Sturgeon, and Fat Pocketbook Mussel in the Lower Mississippi River (USACE 2013) that addresses the Channel Improvement Program (CIP) of the Mississippi River and Tributaries Project. It identifies programmatic mechanisms by which the CIP is incorporating ecological engineering opportunities, cost-effective restoration and other conservation measures to maintain and improve habitat for the recovery of endangered species and other trust species.

Examples of Completed Habitat Restoration

The Lower Mississippi Conservation Committee (LMRCC), a coalition of 12 state natural resource and environment quality agencies, has been involved with 29 aquatic habitat improvement projects in the Lower Mississippi River sub-basin since 2013. These projects have collectively rehabilitated 101.75 river miles of side channel habitats. Other habitat project within the basin have included notching rock dikes and reconnecting meander cutoffs along the Mississippi River. The USACE has notched 29% of the 774 dikes between river miles 212 and 953.5 (LMRCC 2015).

Figure 6. Dyke notching of 225 dykes has opened up additional habitat to aquatic life between river miles 212 and 953.5 on the Mississippi River. These efforts help ensure fish and other aquatic life are not stranded following high-water events when they seek flow refuges in the shelter of these structures. For some species they also provide spawning, feeding, hunting, and/or shelter habitat.

Implementation Needs

A recent assessment by the U.S. Army Corps of Engineers listed multiple areas of habitat implementation needs in the LMR, including:

1. Restoration of backwater areas, side channels, and floodplain lakes,
2. Restoration of bottomland hardwood forests in the Mississippi River and tributary floodplains,
3. Improved water quality,
4. Restoration of in-channel habitat such as gravel bars, sand bars, and islands
5. Preserving and rebuilding coastal wetlands, and
6. Control of exotic invasive species (USACE 2015).

Table 3. Interjurisdictional rivers (6th order and larger) of the Lower Mississippi River Sub-basin.

Rivers	Stream Order	States	Tribal
Mississippi	**10**	**MS, LA, TN, AR, MO, KY**	
Ohio	**9**	**OH, PA, WV, KY, IN, IL**	
Hatchie	**6**	**TN, MS**	
St. Francis	**7**	**AR, MO**	
Right Hand Chute Little River	**6**	**MO, AR**	
White	**8**	**AR, MO**	
Arkansas	**9**	**AR, KS, CO, OK**	
Yazoo	**7**	**MS, LA**	
Red	**8**	**TX, OK, AR, LA**	
Black[1]	**7**	**LA**	
Oauchita	**7**	**LA, AR**	
Bayou Bartholomew	**6**	**LA, AR**	
Boeuf	**6**	**LA, AR**	
Amite	**7**	**MS, LA**	
Atchafalaya[2]	**8**	**LA**	

[1] The Black River is not an interjurisdictional river, but it is formed by interjurisdictional tributaries.

[2] The Atchafalaya River is not an interjurisdictional river, but it is a distributary river formed by the Mississippi and Red rivers.

Table 4. Select ecological and economic statistics for the Lower Mississippi River Sub-basin.

Lower Mississippi River Sub-basin	
Watershed (square miles)	110,600
Number of Interjurisdictional Rivers	9
Number of States in sub-basin	6
Number of Fish/Mussel Species	121/60
Number of Endangered Fish/Mussels	2/8
Recreational Fishery Value (millions)	$2,576.2
Commercial Fishery Value (millions)	$3.147
Commercial Fish Harvest (lbs.)	8,270,000
2011 Commercial Navigation (tons)	530,000

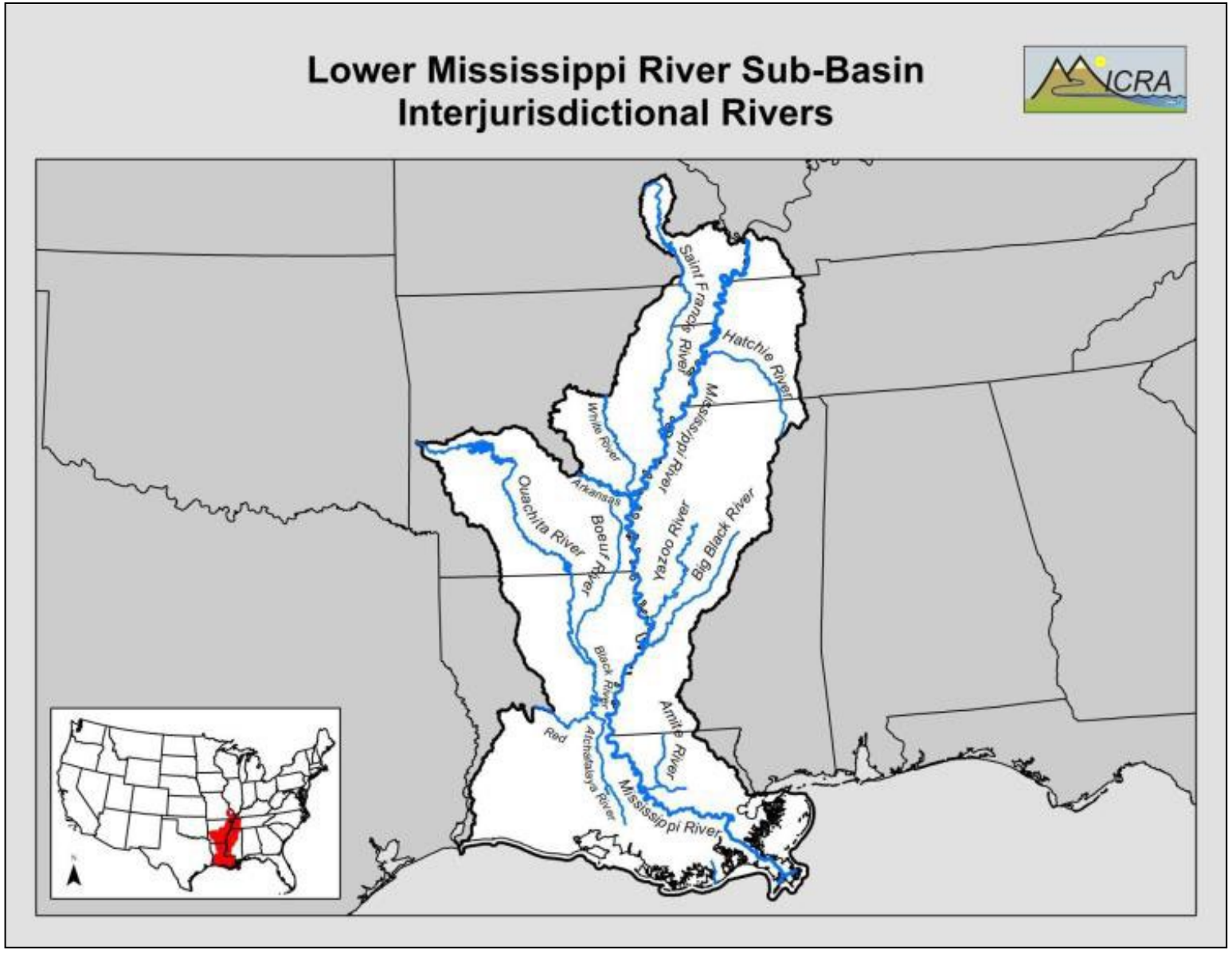


Figure 7. Select 6th order and larger interjurisdictional rivers of the Lower Mississippi River Sub-basin.

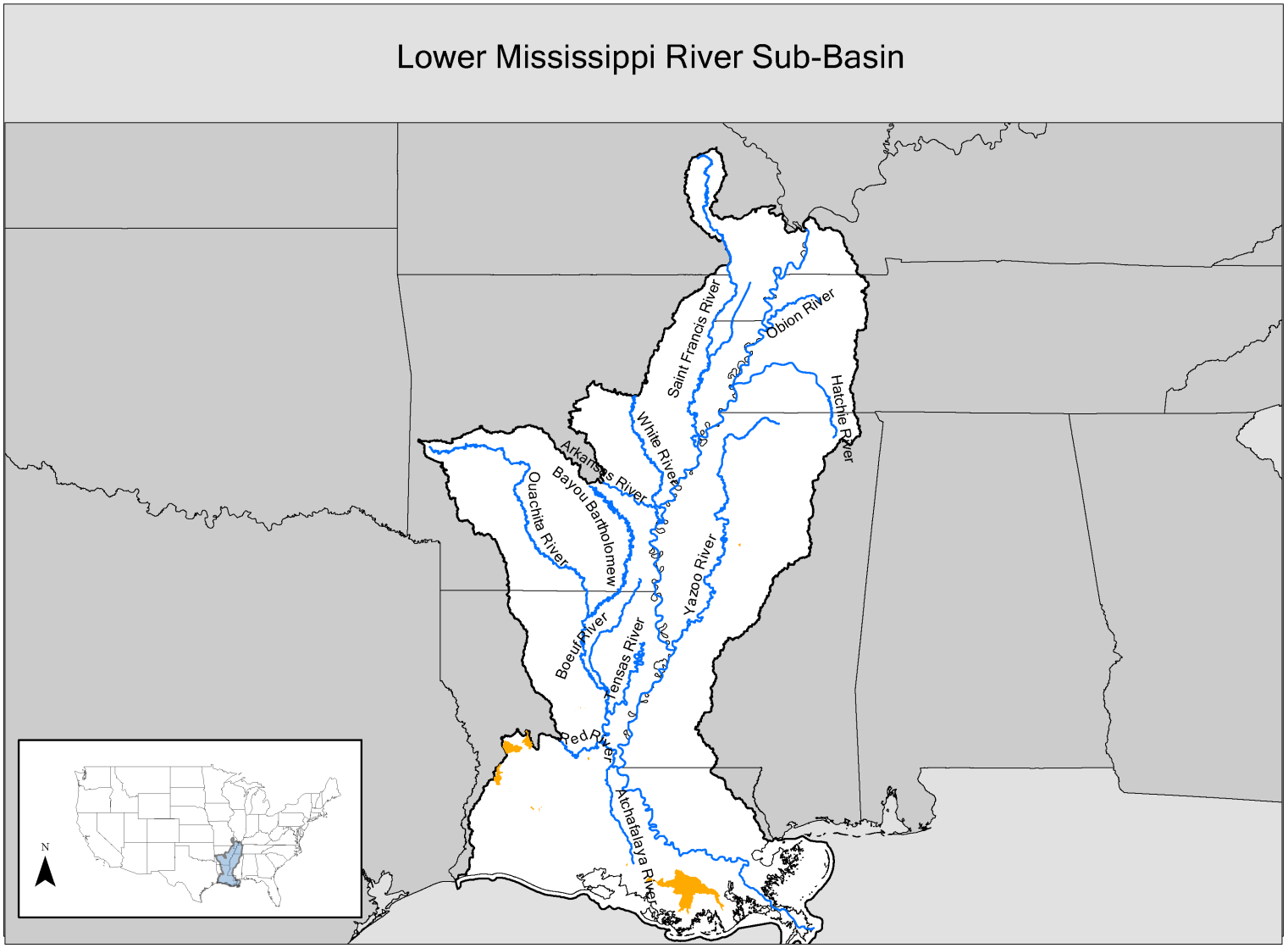


Figure 7. Select 6th order and larger interjurisdictional rivers of the Lower Mississippi River Sub-basin. Orange polygons indicate tribal territories.

Literature Cited

Baker, J. A., K. J. Killgore, and R. L. Kasul. 1991. Aquatic habitats and fish communities in the Lower Mississippi River. Reviews in Aquatic Sciences (3): 331-356.

Industrial Economics, Inc. 2014. The Economic Profile of the Lower Mississippi River: An Update. Final Report February 13, 2014.

Killgore, K. J., J. J. Hoover, B. R. Lewis, and R. Nassar. 2012. Ranking secondary channels for restoration using an index approach. EMRRP Technical Notes Collection. ERDC TN-EMRRP-ER-15. Vicksburg, MS: U.S. Army Engineer Research and Development Center. http://el.erdc.usace.army.mil/emrrp/techran.html.

Lower Mississippi River Conservation Committee. 2015. Restoring America's Greatest River: A Habitat Restoration Plan for the Lower Mississippi River. Published electronically at http://lmrcc.org. Vicksburg, Mississippi.

Lower Mississippi Region Comprehensive Study Coordinating Committee. 1974. Lower Mississippi Region Comprehensive Study.

U.S. Army Corps of Engineers (USACE). 2013. Conservation Plan for the Interior Least Tern, Pallid Sturgeon, and Fat Pocketbook Mussel in the Lower Mississippi River (Endangered Species Act, Section 7(a)(1)). USACE-MVD. Vicksburg, Mississippi.

U.S. Fish and Wildlife Service (USFWS). 2012. Lower Mississippi River Strategic Habitat Conservation Plan. U.S. Fish and Wildlife Service. Jackson, Mississippi.

Fish and Wildlife Service (USFWS). 2013. Biological Opinion, Channel Improvement Program, Mississippi River and Tributaries Project, Lower Mississippi River. Mississippi Field Office U.S. Fish and Wildlife. Jackson, Mississippi.
http://www.fws.gov/mississippiES/_pdf/LMRBiologicalOpinion.pdf

Missouri River Sub-Basin

Mississippi Interstate Cooperative Resource Association

Geography

The Missouri River Basin encompasses 1/6 of the continental United States and is the second largest basin behind the Mississippi with drainage exceeding 530,000 square miles. The basin covers portions of 10 states and 2 Canadian provinces. The Missouri River is the longest river in the United States at 2,341 miles with head waters in the Bitterroot Mountains of Montana and flows into the Mississippi River near St. Louis, MO. Land use within the basin is comprised of cropland (37%), grassland (30%), shrub (13%), forested (11%), and developed areas (9%) (Galat et al. 2005).

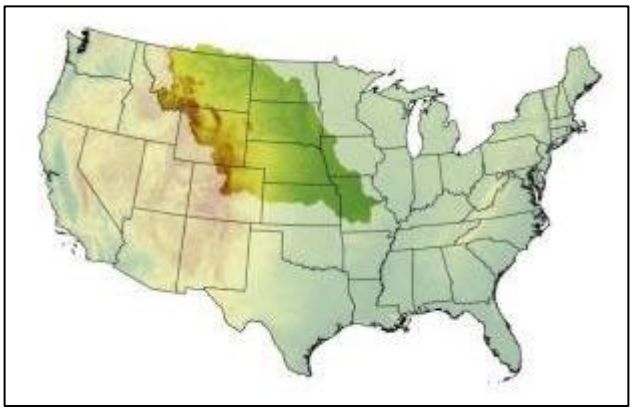


Figure 8: The Missouri River Sub-Basin, or watershed, includes rivers and lakes from 9 states.

The Pick Sloan Plan and Missouri River Navigation Project greatly impacted the Missouri River Basin. The construction of 6 main stem dams and channelization of the lower 750 miles resulted in 3 million acres of riparian habitat being altered including the loss of 522,000 acres primarily for agriculture production. The current Missouri River configuration has left 1/3 of the river impounded, 1/3 channelized, and the remaining 1/3 influenced by reservoir releases. Water Resource Development Acts (WRDA 1986, 1999, and 2007) authorized the restoration of 166,750 acres and USFWS Biological Opinion (2000, amended 2003) in response to listing of threatened and endangered species required restoration of up to 20,000 acres of shallow water habitat in the channelized portion of the Missouri River.

The Missouri River is a vital resource for the inhabitants of the basin and Congress has authorized 8 river management purposes: water quality, water supply, hydropower, flood control, irrigation, navigation, fish and wildlife, and recreation.

Economics

The Missouri River provides drinking water for 3.1 million people in the basin and water intake for 25 power plants (Galat et al. 2005). In addition to those power plants, all main stem dams have hydropower plants. Operation of the main stem dams averts an estimated $414 million/year in flood damage

Figure 9: Missouri River, Montana.

(USACE 1998). The river provides over $12 million/year in irrigation benefits. Commercial navigation on the Missouri River has been declining since its peak in 1977 and currently averages around 5 million tons transported each year (USACE 2016) with sand and gravel being the most common material hauled and generally for very short distances, not long-haul commercial products. The net economic benefit for commercial navigation is less than 3 million dollars per year with most traffic occurring below Kansas City, MO or the lower 367.5 river miles of the channelized reach of the lower Missouri River (National Research Council 2002). In 1994, recreation benefits from Fort Peck Lake to the confluence were reported as $87.1 million. In the state of Missouri alone it was reported that there is $12 billion in economic impact from wildlife related recreation and forest products industry (DOI, et al. 2011). Jacobson et al. (2014) reported that if lateral connectivity were restored through habitat mitigation it would not only increase flood storage capacity but would benefit restoration efforts for fish and wildlife. These efforts would save tens of billions of federal expenditures for flood control/damage. This is especially important in the river reaches between large cities where opportunities to achieve this dual purpose still exist.

Problem Statement/Greatest Needs

The alteration of 3 million acres of natural river habitat has resulted in 51 native fish species becoming rare, uncommon, or decreasing. Furthermore, there is little to no cottonwood reproduction, which was historically the most dominant floodplain tree, and a 70% reduction in aquatic insects (National Research Council 2002).

Platte River

The over utilization of Platte River Basin water resources significantly impacted flows in the central Platte River that is utilized by federally threatened and endangered species. Nebraska, Colorado, and Wyoming signed a cooperative agreement and with assistance from the Bureau of Reclamation, USFWS, stakeholders, and environmental groups developed the Platte River Recovery Implementation Program.

Figure 10. North Platte River, Wyoming

Niobrara River

The Nebraska Game and Parks Commission has entered a Memorandum of Understanding with the Niobrara River Basin Alliance and Nebraska Public Power District to possibly obtain Spencer Hydro-dam and water rights for $12 million dollars to improve stream flows. During the spring 2019 rain-on-snow event, which caused severe flooding across much of Nebraska including the Niobrara River basin, Spencer Dam was blown out by ice flows.

Yellowstone River

The Lower Yellowstone Project (Intake Dam) diverts water for irrigation in Montana and North Dakota, but it impedes upstream migration of pallid sturgeon and other native species. The

diversion dam and canal have been modified with a fish passage structure to prevent entrainment and improve passage.

Existing Partnerships/Plans

Missouri River Natural Resources Committee (MRNRC)

MRNRC was formed in 1988 and is comprised of members from the seven state fish and game agencies that border the main stem Missouri River. The purpose of this committee is to provide management recommendations and technical assistance to state and federal agencies with river management responsibilities. MRNRC sponsors an annual conference to encourage information exchange (MRNRC 2016).

Missouri River Ecosystem Recovery Plan (MRERP)

This program was defunded following 2011 flood event. The purpose of this collaborative effort between the US Army Corps of Engineers and USFWS was to develop a plan to guide recovery efforts on the Missouri River for the next 30 to 50 years (USACE 2016).

Missouri River Recovery Implementation Committee (MRRIC)

MRRIC was authorized by Congress in WRDA 2007 to make recommendations and provide guidance on MRERP and MRRP. The Committee is comprised of representatives from 8 states, 18 American Indian Tribes, 15 federal agencies, and 16 non-government categories represented by 28 stakeholders (USACE 2016).

Missouri River Recovery Program (MRRP)

The scope for MRRP applies to the Missouri River from Fort Peck to the confluence with the Mississippi and the Yellowstone River from Intake Dam to the confluence with the Missouri. It is designed to address the BIOP and BSNP Mitigation plan (USACE 2016).

Platte River Recovery Implementation Program (PRRIP)

The PRRIP Final agreement was signed on January 1, 2007. In 2005, it was estimated to cost $320 million for the entire program. Habitat work will focus on the Central Platte River Basin between Lexington and Chapman Nebraska. The goal of this project is to provide ESA compliance for existing and future water related activities (PRRIP 2016).

Examples of Completed Habitat Restoration

About 60,000 acres of habitat has been acquired for restoration efforts in the Missouri River below Gavins Point Dam. Habitat restoration actions include construction of emergent sandbars within the designated Missouri National Recreational River in South Dakota and Nebraska, and top width widening projects, side channels, backwater complexes, and interception and rearing complexes in Iowa, Nebraska, Kansas, and Missouri (Figure 11). Biological monitoring of the areas indicates that these projects are providing vital habitats for native riverine species. However, most of these side channels and backwater complexes have been closed off as a

result of the 2011 and 2019 floods and construction of new IRCs has been halted due to lack of understanding of impacts to other authorized purposes.

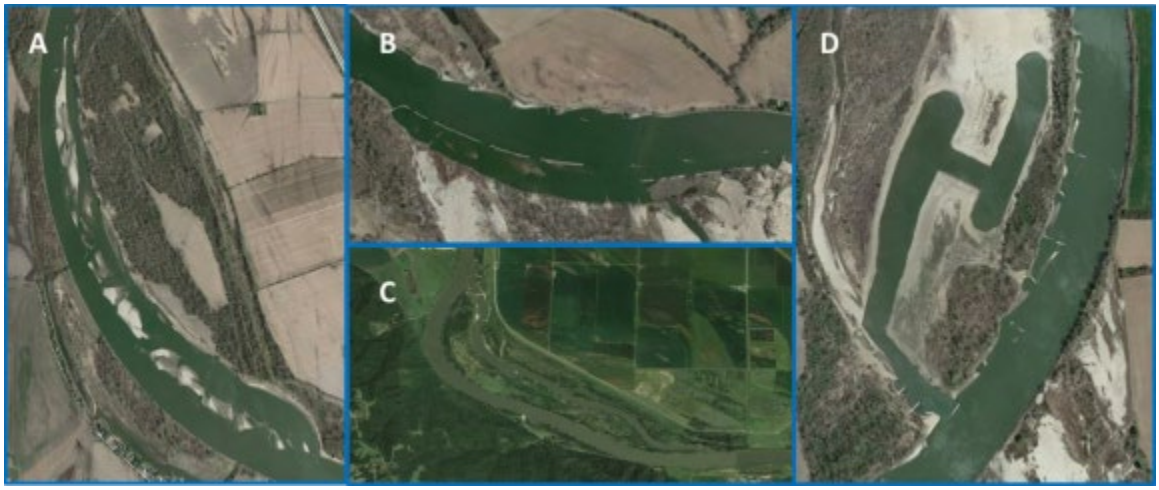


Figure 11. Habitat restoration sites in the Missouri River below Gavins Point Dam. Deer Island (A) located near Tekamah, NE represents a top-width widening project, Lower Decatur revetment lowering (B) located near Decatur, NE, Deroin side channel (C) located near Indian Cave State Park, NE, and Glover's Point backwater complex (D) located near Sloan, IA.

Table 5. Number and types of habitat restoration projects constructed in the Missouri River.

Missouri River Habitat Restoration	
Side channels chutes	39
Backwaters	14
Revetment chutes	20
Top-width projects	3
Navigation dike modifications	2,150

Implementation Needs

Although over 100,000 acres remains to be acquired from willing sellers and restored to meet the Corps requirements for mitigation of the Missouri River Navigation Project, the Corps has not funded this requirement for the past several years. This land acquisition is imperative for enhancing the natural form and function of the Missouri River. It would allow for reduction of flood risks due to increased channel capacity, increased recreation opportunities, and provide vital habitat for fish and wildlife.

Table 6. Interjurisdictional rivers (6th order and larger) of the Missouri River Sub-basin.

Rivers	Stream Order	States	Tribal
Missouri	9	MO, NE, SD, ND, MT, IA, KS	x
Madison	6	WY, MT	
Gallatin	6	WY, MT	
Milk[2]	6	MT, AB[3], SK[3]	X
Marias[2]	6	MT, SK[3]	X
Yellowstone	8	WY, MT, ND	
Clarks Fork	6	WY, MT	
Bighorn[2]	7	MT, WY	X
Wind[2]	7	WY	X
Tongue[2]	6	MT, WY	X
Powder	6	MT, WY	
Little Missouri	6	SD, ND, WY, MT	X
Grand[1]	6	SD	
North Fork Grand	6	ND, SD	
Moreau[2]	6	SD	X
Cheyenne	7	WY, SD	
Belle Fourche	6	WY, SD	
White	6	SD, NE	X
Niobrara	6	WY, NE	
James	7	ND, SD	
Big Sioux	7	SD, IA	
Rock	6	MN, IA	
Little Sioux	6	IA, MN	
Platte[1]	8	NE	
South Platte	7	NE, CO	
Laramie	6	WY, CO	
North Platte	7	NE, WY, CO	
Nishnabotna	6	IA, MO, NE	
Kansas[1]	8	KS	
Smoky Hill	7	CO, KS	
Republican	7	NE, KS	
Beaver Creek	6	WY, SD	
Big Blue	7	NE, KS	
Little Blue	6	NE, KS	
Grand	7	IA, MO	
Thompson	6	IA, MO	
Osage[1]	7	MO	
Marais des Cygne	6	KS, MO	

[1] The Grand (SD), Platte, Kansas, and Osage rivers are not interjurisdictional rivers but are formed by interjurisdictional tributaries.

[2] The Milk, Marias, Bighorn, Wind, Tongue, and Moreau rivers flow through or border tribal lands.

[3] AB = Alberta Canada, SK = Saskatchewan

Table 7. Select ecological and economic statistics for the Missouri River Sub-basin.

Missouri River Sub-basin	
Watershed (square miles)	520,900
Number of Interjurisdictional Rivers	29
Number of States in sub-basin	10
Number of Fish/Mussel Species	166/44
Endangered Fish/Mussel Species	5/2
Recreational Fishery Value (millions)	$3,011.8
Commercial Fishery Harvest (lbs.)	157,256
2016 Commercial Navigation (million tons)	4.66

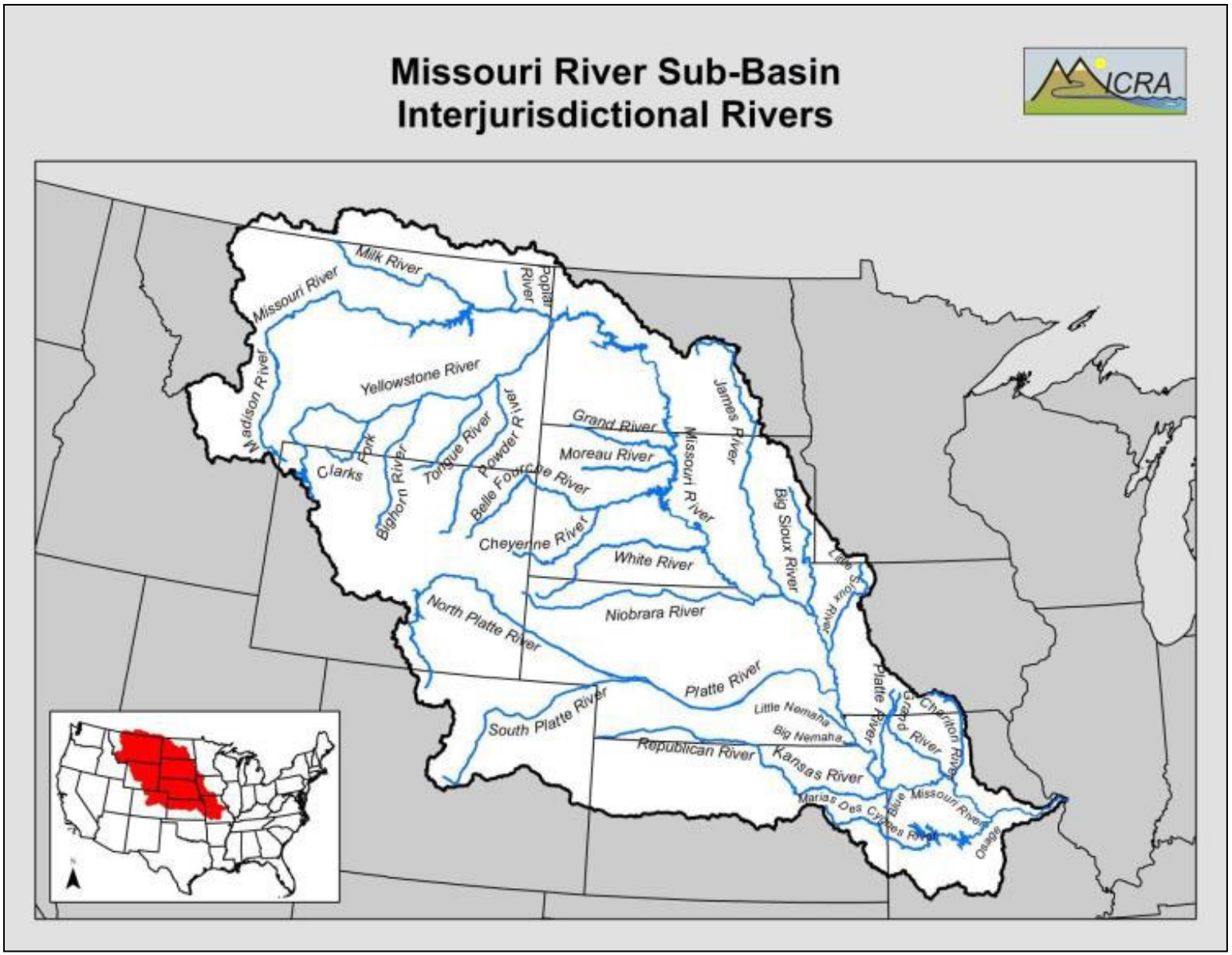


Figure 12. Select 6th order and larger interjurisdictional rivers of the Missouri River Sub-basin.

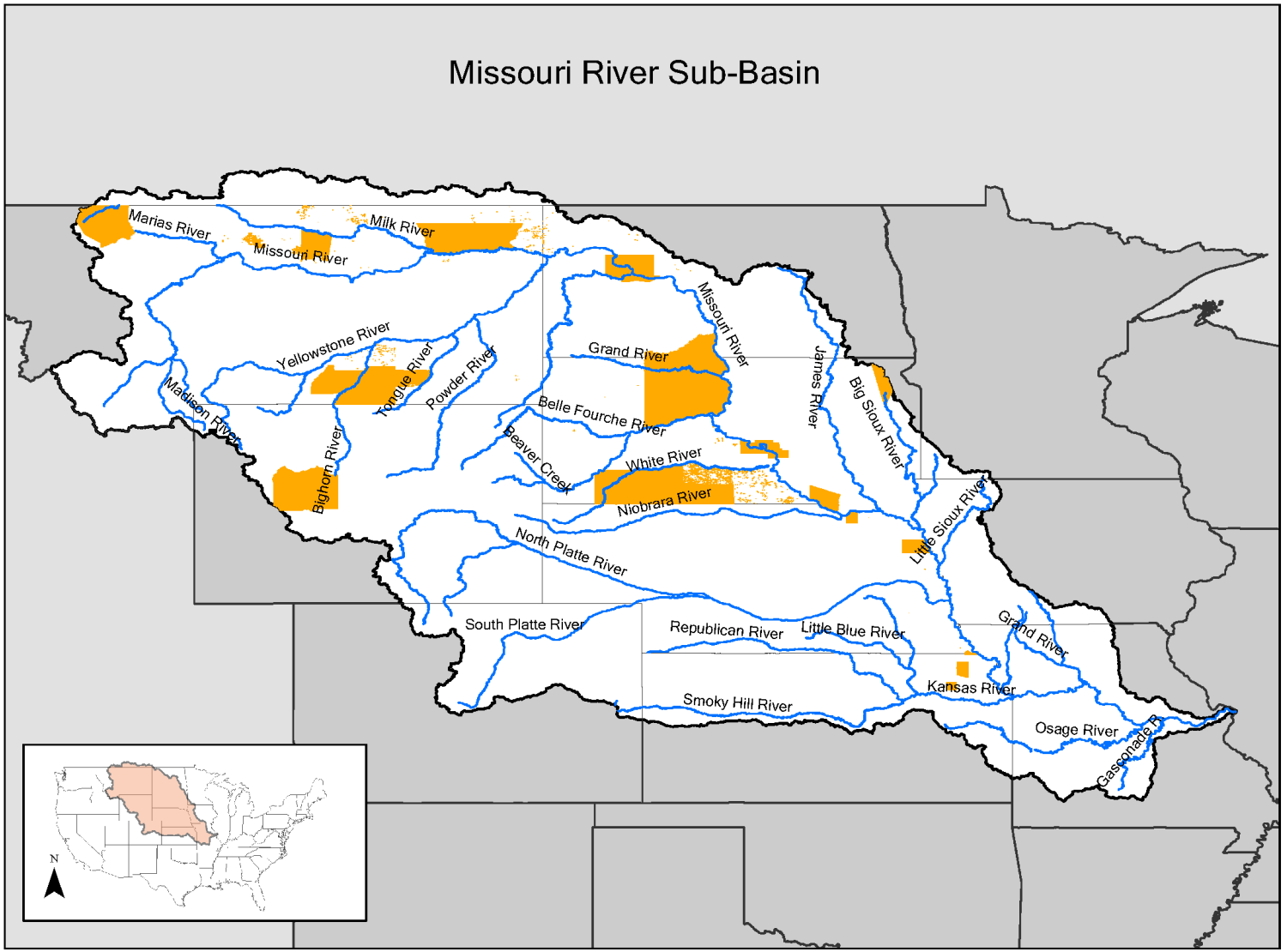


Figure 12. Select 6th order and larger interjurisdictional rivers of the Missouri River Sub-basin. Orange polygons indicate tribal territories.

Literature Cited

Galat, D.L., C. R. Berry Jr., E. J. Peters and R. G. White. 2005. Missouri River. Pages 427-480 *in* A. C. Benke and C. E. Cushing (editors). Rivers of North America, Elsevier, Oxford.

Jacobson, R.E., G. Linder, and C. Bitner. 2014. The role of floodplain restoration in mitigation flood risk, Lower Missouri River, USA. *In:* Flood Risk & Restoration, Hudson, P.F. and Middlekoop, H. (In press).

Missouri River Association of States and Tribes (MoRAST). 2016. http://mo-rast.org/

Missouri River Natural Resources Committee (MRNRC). 2016. http://mrnrc.com/

National Research Council. 2002. *The Missouri River ecosystem: Exploring the prospects for recovery.* Water Science and Technology Board, National Research Council, Washington, D.C.

Platte River Recovery Implementation Program (PRRIP). 2016. https://www.platteriverprogram.org/

U.S. Army Corps of Engineers (USACE). 1998. Volume 6F: Economic Studies, Flood Control (Revised), Interior Drainage, Groundwater. In: Master Water Control Manual, Missouri River Review and Updated Study. Omaha, NE: USACE Northwest Division, Missouri River Region.

U.S. Army Corps of Engineers (USACE). 2016. Missouri River Recovery Program. http://moriverrecovery.usace.army.mil

U.S. Army Corps of Engineers (USACE). 2016. *Final Waterborne Commerce Statistics for Calendar Year 2016.* Waterborne Commerce Statistics Center, USACE, New Orleans, LA.

U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2011. National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

U.S. Fish and Wildlife Service (USFWS). 2000. Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project and Operation of the Kansas River Reservoir System.

U.S. Fish and Wildlife Service (USFWS). 2003. Amendment to the 2000 Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project and Operation of the Kansas River Reservoir System.

Water Resources Development Act. 1986.

Water Resources Development Act. 1999.

Water Resources Development Act. 2007.

Ohio River Sub-Basin

Mississippi Interstate Cooperative Resource Association

Geography

The Ohio River sub-basin is a 145,000 square-mile basin that is shared by 7 states in four regions. Aquatic habitats range from cascading Appalachian headwater streams to lowland meandering rivers of the Jackson Purchase region. These unique habitats coalesce to form mainstem Ohio River; the second largest river in the United States as measured by mean annual discharge. The Ohio River is 981 miles (1582 km) long, starting at the confluence of the Allegheny and the Monongahela Rivers in Pittsburgh, Pennsylvania, and ending in Cairo, Illinois, where it flows into the Mississippi River. Average depth is 24 feet, with the widest point at 1 mile near Smithland, Kentucky. Many states share borders with the Ohio River, including West Virginia, Kentucky, Ohio, Indiana, and Illinois (ORSANCO 2014).

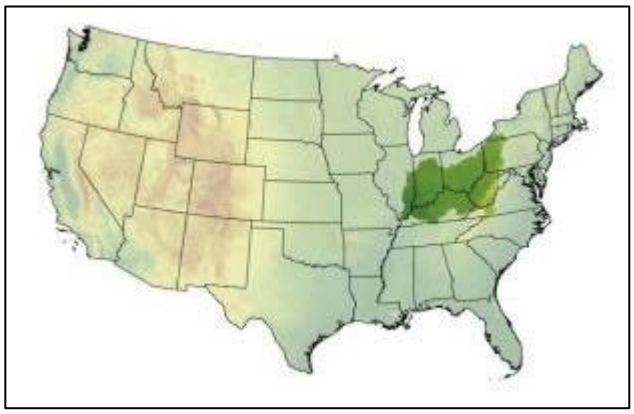


Figure 13. The Ohio River Sub-Basin, or watershed, includes rivers and lakes from 7 states.

Economics

Due to its westwardly flow and confluence with the Mississippi River, the Ohio River has always been a major transportation route. Early pioneers used the river for westward expansion and exploration. Currently, 20 lock-and-dams span the 981 miles of the mainstem Ohio River, providing a vital means of transporting goods throughout the entire eastern U.S. This infrastructure provides an estimated 230 million tons of cargo to be shipped annually, with the majority consisting of coal, oil, and petroleum. 49 power generating facilities are located within the basin providing a clean source of electricity. Over 35,000 people are employed by over 600 businesses that are directly tied to the Ohio River. Including major tributaries, there are approximately 358,000 jobs linked to river commerce. These businesses include barge operation and maintenance, marinas, power generating facilities, loading/unloading facilities, and commercial and recreational fishing (ORSANCO 1995).

The Ohio River sub-basin is not only home to at least 350 fish species and over 120 mussel species, but also home to more than 31.5 million U.S. citizens. An estimated 5 million people rely on the Ohio River as a source of drinking water. Of the 350 fish species in the entire basin, 140 fish species utilize the habitat of the Ohio River (Burr and Warren 1986, ORSANCO 2014). Therefore, numerous fish species play an important economic role, both through sport and commercial fisheries.

Problem Statement/Greatest Needs

The convenience of the Ohio River for transporting goods has influenced the loss of habitat quality and natural resources throughout the entire basin. Impacts to the river include agriculture, industrialization, urbanization, water pollution, mining, impoundments, and invasive species. Of the 800 permitted discharges into the Ohio River, 49 come from power-generating facilities, 180 from municipal wastewater discharges, and over 300 from industry (ORSANCO 2014). However, with recent environmental regulations and facility upgrades, water quality has improved in the Ohio River over the past 50 years. Even with recent improvements, aquatic habitats remain in need of protection and restoration. Forested riparian zones and island acreages have been reduced or converted by 65% and 45%, respectively (USACE 2000). With the numerous dams throughout the basin, riffle/pool complexes have been eliminated. These impacts have reduced the available habitat for a multitude of aquatic and terrestrial species that rely on the Ohio River for survival. The protection and restoration of riparian zones, islands, and wetlands of the Ohio River is crucial for the survival of the diverse aquatic resources throughout the basin.

Existing Partnerships/Plans

Ohio River Basin Alliance (ORBA)

The ORBA is made up of over 200 representatives from over 80 state, local, and federal agencies, industry, academia, and not-for-profit organizations. Their mission is to form a successful collaboration that will recommend strategies and coordinate actions to address complex water resource challenges and priorities with a unified voice. The Alliance is voluntarily led by a Steering Committee and has four Working Groups that address specific basin issues. The ORBA is conducting a pilot study on how climate change will impact the Ohio River Basin.

Ohio River Ecosystem Restoration Program (ORERP)

The ORERP was developed in 2000 as part of the Corp of Engineers Ohio River Mainstem System Study. The goal of this program is to prioritize restoration efforts of the mainstem Ohio River, and ultimately restore ecosystem functions to a more natural and self-regulating system. Specifically, the ORERP has the opportunity to restore 25,000 acres of bottomland hardwood forest, 1,250 acres of aquatic habitat, 40 islands, 100 miles of riparian habitat, and 25,000acres of wetlands along the Ohio River floodplain. Authorization of this program would provide around 200 million dollars for these restoration projects, however funding has yet to be appropriated for the implementation of the ORERP.

Ohio River Basin Fish Habitat Partnership (ORBFHP)

In 2009, the ORBFHP was recognized by the National Fish Habitat Partnership. The OHBFHP's mission is to protect, restore, and enhance priority habitat for fish and mussels in the watersheds of the Ohio River basin (excluding the Tennessee River sub-basin to avoid overlap with the Southeast Aquatic Resources Partnership, SARP) for the benefit of the public. The ORBFHP collaborated with SARP to complete a basin- wide stream habitat assessment in 2012 to help identify priority areas and select priority projects for funding. This assessment was used to determine threats to aquatic ecosystems in separate watersheds within the Ohio River sub-

basin. The ORBFHP developed a list of specific actions designed to ultimately reverse declines in the quality and quantity of aquatic habitats and improve the overall health of fish and other aquatic organisms. Again, funding is the limiting factor; securing grants will be necessary for implementing proposed habitat restoration projects.

Ohio River Foundation (ORF)

The ORF is a 501(c)(3) non-profit organization founded in 2000 by a group of citizens concerned about the need for increased response to the degradation of the Ohio River. ORF's mission is to protect and restore the water quality and ecology of the Ohio River and its tributaries for the health and enjoyment of present and future generations. The ORF works with scientists, businesses, and governmental agencies to protect and improve water quality within the Ohio River watershed. In addition, they increase public involvement in development activities and initiatives affecting the Ohio River.

Examples of Completed Habitat Restoration

Gravel Bed Installation

Gravel beds were established at selected locations in Bryant Creek embayment in an attempt to create fish habitat. Selection criteria for gravel bed placement were locations with water depths 0.6-1.2 m and bottom substrate conditions sufficient to support the addition of gravel beds. Two locations were chosen within the embayment, and beds were constructed using 19.1 m^3 of a combination of 10.2-20.3 cm limestone riprap and 3.8 cm smooth river rock placed using boats with modified manual dumping platforms. This yielded mixed gravel beds approximately 30.5 m long by 3.1 m wide by 0.2 m thick.

Establishment of Aquatic Macrophytes

Three aquatic macrophyte species were used to establish founder colonies to enhance habitat in the study area, including Broadleaf Arrowhead, American Water Willow, and American Pondweed. An initial bathymetry assessment was conducted to identify suitable locations for establishing macrophyte founder colonies. Of the identified locations, two were selected and planted with founder colonies in the embayment. Mature Broadleaf Arrowhead and American Water Willow plants were obtained from Spence Restoration Nursery (Muncie, IN). Approximately 150 individuals of each species were planted at each of the two selected locations. American Pondweed clippings were collected from sources of healthy, established colonies near West Lafayette, IN, and grown outside in 1,135 L tanks at the Aquaculture Research Laboratory at Purdue University. Clippings were cultivated in containers containing locally collected sediment for approximately 6-8 wk or until suitable size for field planting. A total of 66 pots containing American Pondweed were planted at each of the two locations.

Implementation Needs

During the development of the Ohio River Ecosystem Restoration Program, participants identified the greatest issues affecting natural resources of the Ohio River. Based on this information, goals were established to guide future conservation efforts. These goals included:

1. Protection and restoration of wetlands and bottomland hardwood forests,
2. Protection and restoration of islands, and
3. Improvement of aquatic, shoreline, and riparian habitat.

These broad goals were selected to benefit a wide variety of species, in addition to restoring impaired aquatic functions of the Ohio River (USACE 2000). Funding for the implementation of aquatic habitat enhancement projects on the Ohio River seems to be the limiting factor. In addition, match requirements for non-federal entities may limit the overall scale and type of projects completed. Continued coordination between federal agencies, state agencies, and private organizations is an important component to ensure that assessments and conservation goals remain current.

Table 8. Interjurisdictional rivers (6th order and larger) of the Ohio River Sub-basin.

Rivers	Stream Order	States	Tribal
Ohio	**9**	**OH, PA, WV, KY, IN, IL**	
Allegheny	**8**	**NY, PA**	
Monongahela	**7**	**PA, WV**	
Cheat	**6**	**WV, PA**	
Youghiogheny	**6**	**PA, MD**	
Beaver[1]	**7**	**PA**	
Mahoning	**6**	**OH, PA**	
Little Beaver Creek	**6**	**OH, PA**	
Kanawha[1]	**6**	**WV**	
New	**6**	**WV, VA, NC**	
Big Sandy	**7**	**WV, KY**	
Tug Fork	**6**	**KY, WV, VA**	
Levisa Fork	**6**	**VA, KY**	
Russell Fork	**6**	**KY, VA**	
Wabash	**6**	**IN, IL, OH**	
Vermillion	**6**	**IL, IN**	
Cumberland	**7**	**KY, TN**	
Tennessee	**8**	**KY, TN, MS, AL**	

[1] The Beaver and Kanawha rivers are not interjurisdictional rivers but both are formed by interjurisdictional tributaries.

Table 9. Select ecological and economic statistics for the Ohio River Sub-basin.

Ohio River Sub-basin	
Watershed (square miles)	145,000
Number of Interjurisdictional Rivers	11
Number of States in sub-basin	7
Number of Fish/Mussel Species	161/80
Number of Endangered Fish/Mussels	0/10
Recreational Fishery Value (millions)	$2,509.3
Annual Commercial Fishery Harvest (lbs.)	1,303,664
2011 Commercial Navigation (tons)	279,000

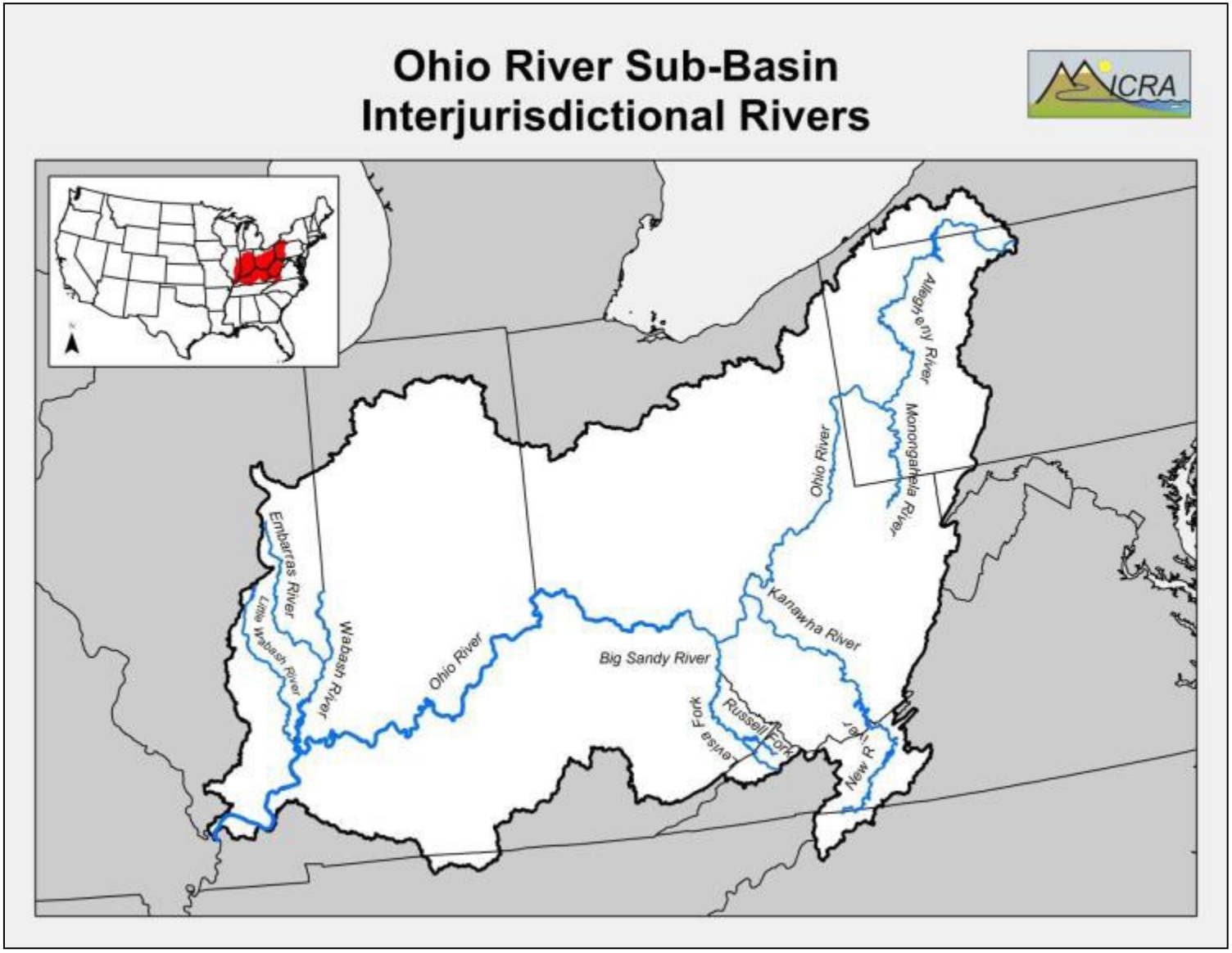


Figure 14. Select 6th order and larger interjurisdictional rivers of the Ohio River Sub-basin.

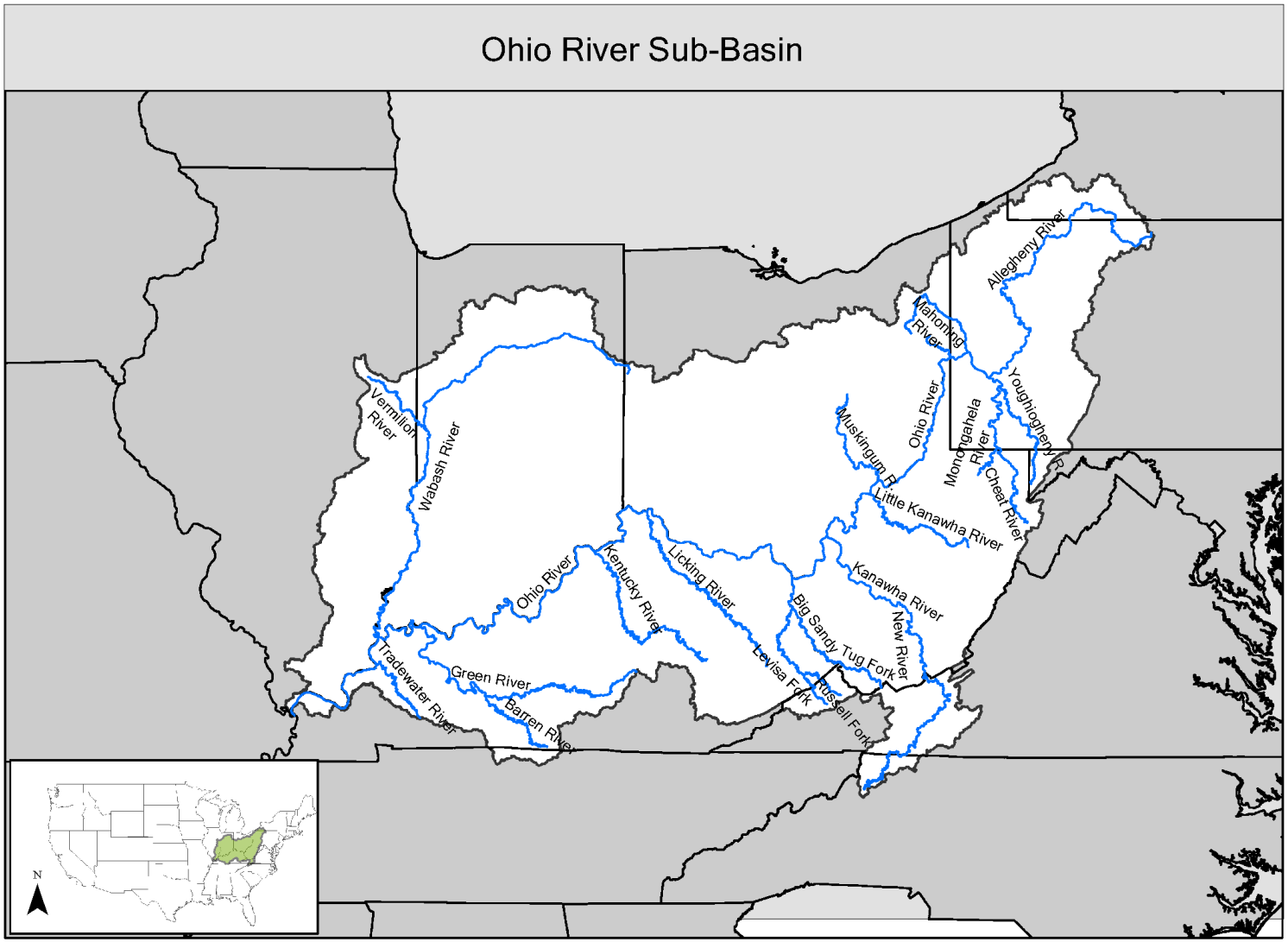


Figure 14. Select 6th order and larger interjurisdictional rivers of the Ohio River Sub-basin. Orange polygons indicate tribal territories.

Literature Cited

Burr, B. M. and M. L. Warren. 1986. A distributional atlas of Kentucky fishes. Kentucky Nature Preserves Commission Scientific and Technical Series Number 4. 398 pp.

Ohio River Valley Water Sanitation Commission (ORSANCO). 2014. Assessment of Ohio River Water Quality Conditions 2009 – 2013. Cincinnati, Ohio. www.orsanco.org

Ohio River Valley Water Sanitation Commission (ORSANCO). 1995. A Valuation Survey of the Ohio River Corridor. Cincinnati, Ohio. www.orsanco.org

U.S. Army Corps of Engineers (USACE). 2000. Ohio Rivers Main Stem Systems Study, Ohio River Ecosystem Restoration Program, Integrated Decision Document and Environmental Assessment. Cincinnati, Ohio.

Tennessee-Cumberland Rivers Sub-Basin

Mississippi Interstate Cooperative Resource Association

Geography

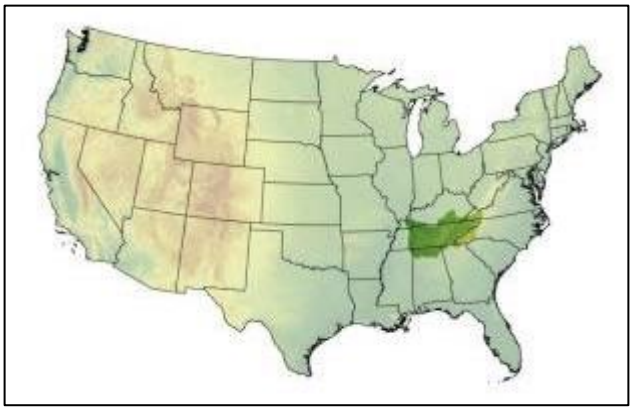


Figure 15. The Tennessee/Cumberland Rivers Sub-Basin, or watershed, includes rivers and lakes from 7 states.

Tennessee River is the largest Ohio River tributary, being approximately 652 miles (1,049 km) long, with a watershed of approximately 40,000 square miles. The watershed includes parts of eight states: Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, West Virginia, and Virginia. Tennessee River is impounded by 9 mainstem dams and 23 tributary dams lie in the drainage. Cumberland River is another large tributary that discharges into the Ohio River just 10 miles upstream of the Tennessee River mouth. Length of the Cumberland River is 652 miles (1,107 km) and its watershed is over 18,000 square miles. The entire Cumberland watershed lies within the states of Kentucky and Tennessee. There are five mainstem dams on the Cumberland River and six tributary dams lie within the drainage.

Tennessee and Cumberland rivers share many faunal elements, and the region has long been recognized as a center of aquatic biodiversity on a global scale. Combined, the two drainages are home to approximately 250 fish species, just over 100 freshwater mussel species, almost 100 aquatic snail species and approximately 60 crayfish species. Within this fauna are some of the most imperiled animals in the world. Federally endangered or threatened species that occur, or historically occurred in these drainages number 56, and include fish, mussels, snails, and crustaceans. The fauna of this region has also suffered many extinctions, including 2 fish, 14 mussels, and 6 snails.

Economics

Tennessee and Cumberland River impounded mainstem reaches serve as major navigational waterways and sources of hydroelectric power, with the added benefits of flood control and aquatic recreation. Smaller tributary reservoirs are primarily for flood control and recreation. As navigational corridors, these rivers are responsible for 57,000 tons of goods annually. The major commodities transported on these rivers are coal and aggregates (sand and gravel), but other products include grain, petroleum products, metals, and chemicals. These have helped keep the region competitive in manufacturing and is also greatly supportive of its agriculture.

Commercial fisheries in these watersheds are economically significant in the Tennessee and Cumberland watersheds. Fish brought to market average > 1.3 million pounds annually. North

American freshwater mussel shells provide the base raw material for worldwide cultured pearl production and the majority of annual exports originate from the Tennessee River. Commercial mussel harvest is cyclic in nature and has ebbed over the past two decades, but exports have exceeded $40 million annually in the recent past. Commercial fisheries in these watersheds are economically significant, but recreational angling provides an even greater economic benefit to the states and adjacent communities. According to the American Sportfishing Association, this recreational activity directly generated over $1.2 billion in 2011 in the state of Tennessee alone. Total value of the recreational fishery in the Tennessee River Sub-basin has been estimated to provide an annual economic boost in excess of $4,192 million (USFWS 2016 unpublished data).

Problem Statement/Greatest Needs

The Tennessee and Cumberland River basins are two of the most biologically diverse systems in the world and elements of these faunas serve as the basis of significant commercial and recreational fisheries, yet their natural habitats have been greatly altered for navigation, hydroelectric energy, flood control, and aquatic recreation. Attending to the needs of these delicate and generally imperiled faunas while maintaining or even increasing the economic importance of these rivers will be an immense challenge. These rivers and their faunas are in great need of routine monitoring to observe changes to both habitat and populations, in order to make more informed conservation decisions. Some of the more important areas for both fisheries and imperiled species lie in reaches just downstream of dams on these rivers. Maintaining or improving water quality in these reaches should be a priority.

Existing Partnerships/Plans

The Tennessee and Cumberland River drainages fall under the influence of a number of conservation partnerships and agencies, many of which have developed plans on their behalf. The National Fish Habitat Partnership focuses on conservation of fish and their habitats throughout the United States. Additionally, A Tennessee River Basin Watershed Management Plan is in place to improve, protect, and maintain the river for multiple beneficial uses and water quality. The Cumberland River Compact is likewise focused on water quality improvement in that basin. All eight states that encompass parts of the Tennessee and Cumberland drainages have State Wildlife Plans with components that address the needs of aquatic habitats and species. These plans are specific to each state but share concern for numerous species and recognize many common needs. Freshwater mollusks have been documented as one of the most critically imperiled groups of organisms on earth and an interagency committee produced the “Plan for the Population Restoration and Conservation of Imperiled Freshwater Mollusks of the Cumberlandian Region” in 2010 and the document is regularly updated.

Most states that encompass the Tennessee and Cumberland basins have made major commitments to conservation of imperiled aquatic species and have facilities dedicated to captive propagation and husbandry, with at least one located in most of the states involved. These facilities and their respective agencies cooperate closely and extensively among themselves, sharing brood stock as well as progeny for population reintroductions and augmentations, as well as for studies on life history.

One unique program aimed at protection of significant aquatic habitats and their faunas is the Alabama Rivers and Streams Network, which now includes drainages that it shares with surrounding states, including the Tennessee drainage. This network is comprised of private companies, nonprofit organizations, state and federal agencies, and concerned citizens with focus on habitat protection and improvement in remaining reaches that still have significant biological resources. The focus areas are termed Strategic Habitat Units for smaller subdrainages and Strategic River Reach Units for significant reaches of mainstem habitat. Since clean water and functional habitats are beneficial to all stakeholders, a key aspect of the group is to demonstrate direct and immediate cost benefits related to such conservation efforts.

Examples of Completed Habitat Restoration

Habitat restoration efforts in the Tennessee and Cumberland river basins have been partnership driven with most of these projects focused on increasing aquatic connectivity and improving riparian habitat. These partnerships have resulted in dam removal projects within both the Tennessee River and Cumberland River basins, land purchases, and cooperative riparian habitat initiatives. Additional small-scale aquatic habitat improvement projects have been conducted by state, federal, and non-governmental organization programs on streams, rivers, and reservoirs.

Cumberland River Basin

Roaring River Watershed

The Roaring River State Scenic River is tributary to the Cumberland River located outside of Gainesboro, Tennessee. On-going efforts have worked to protect and restore this valuable watershed. The Tennessee Wildlife Resources Agency manages three Wildlife Management Areas along the Roaring River and its major tributary Blackburn Fork. These Wildlife Management Areas collectively protect 15-miles of shoreline within the watershed and provides hunting, fishing, and recreational access. In 2017, the Tennessee Wildlife Resources Agency, Southeast Aquatic Resources Partnership, U.S. Fish & Wildlife Service, Nature Conservancy, Army Corps of Engineers, and the Tennessee Department of

Figure 16. Roaring River, TN – Roaring River Dam Removal Project. Roaring River Dam (left) was removed in 2017. Removal of the dam increased aquatic connectivity and improved instream habitat (right).

Environment & Protection partnered to restore stream habitat and increase aquatic connectivity along the Roaring River which resulted in the largest dam removal project for stream restoration purposes in Tennessee. Removal of the dam restored approximately 1-mile of stream habitat that was previously impounded and connected nearly 5-miles of the lower river to its headwaters. Additional riparian restoration and shoreline stabilization projects have been completed within the watershed.

Tennessee River Basin

Duck and Elk River Watershed Forest and Buffer Initiative

The Duck and Elk rivers are two of the highest priority watersheds in the Tennessee River basin due to their aquatic biodiversity and high number of "species of concern." In 2020, the Tennessee Division of Forestry, American Forest Foundation, National Fish & Wildlife Federation, Tennessee Forestry Association and other partners created the Elk and Duck River Watershed Forest and Buffer Initiative to promote, maintain, and improve habitat within these priority sub-basins. The grant funded initiative engages local landowners within these two watersheds (encompassing 13 counties) and enables them to maintain healthy forests and water and improve habitat for at-risk and other species. To date, $48,000 has been approved for cost share on 424 acres for 9 landowners and adds 5.4-miles of linear riparian habitat under improved management.

Implementation Needs

Assessment of Tennessee and Cumberland River habitat and populations has been carried out by an assortment of state and federal agencies, generally on a small geographic scale or with a particular subject or population as the focus, and often within single agencies without cooperation with other entities. Likewise, these have been funded by a variety of state and federal monies. A unified effort to periodically assess habitats, as well as imperiled and economically significant populations, should be carried out across these two basins. Funding necessary for such an endeavor will be substantial.

Table 10. Interjurisdictional rivers (6th order and larger) of the Tennessee-Cumberland Rivers Sub-basin.

Rivers	Stream Order	States	Tribal
Tennessee (including Kentucky Lake, Pickwick Lake, and Guntersville Lake)	**8**	**KY, TN, MS, AL**	
Holston[1]	**6**	**TN**	
South Fork Holston	**6**	**TN, VA**	
Wautaga (including Wautaga Reservoir)	**6**	**TN, NC**	
French Broad	**7**	**TN, NC**	
Nolichucky	**6**	**TN, NC**	
Little Tennessee (including Tellico and Calderwood Reservoirs)	**6**	**TN, NC, GA**	
Clinch	**6**	**VA, TN**	
Hiwassee (including Chatuge and Nottely Reservoirs)	**6**	**TN, AL**	
Elk	**7**	**TN, AL**	
Tennessee-Tombigbee Waterway[2]	**N/A**	**TN, MS, AL**	
Cumberland (including Cordell Hull Lake and Dale Hollow Lake)	**7**	**KY, TN**	
Red	**6**	**KY, TN**	

[1] The Holston River is not an interjurisdictional river, but it is formed by interjurisdictional tributaries.

[2] The Tennessee-Tombigbee Waterway is an interjurisdictional waterway that connects the Tennessee River to the Tombigbee River in the Mobile Drainage. The manmade divide cut that connects these two rivers is not in the USGS NHD flowline database and therefore no stream order is provided in the table.

Table 11. Select ecological and economic statistics for the Tennessee-Cumberland Rivers Sub-basin.

Tennessee/Cumberland Rivers Sub-basin	
Watershed (square miles)	58,800
Number of Interjurisdictional Rivers	17
Number of States in sub-basin	7
Number of Fish/Mussel Species	164/50
Number of Endangered Fish/Mussels	10/5
Recreational Fishery Value (millions)	$4,192.4
Annual Commercial Fishery Harvest (lbs.)	1,324,084
2011 Commercial Navigation (tons)	57,000

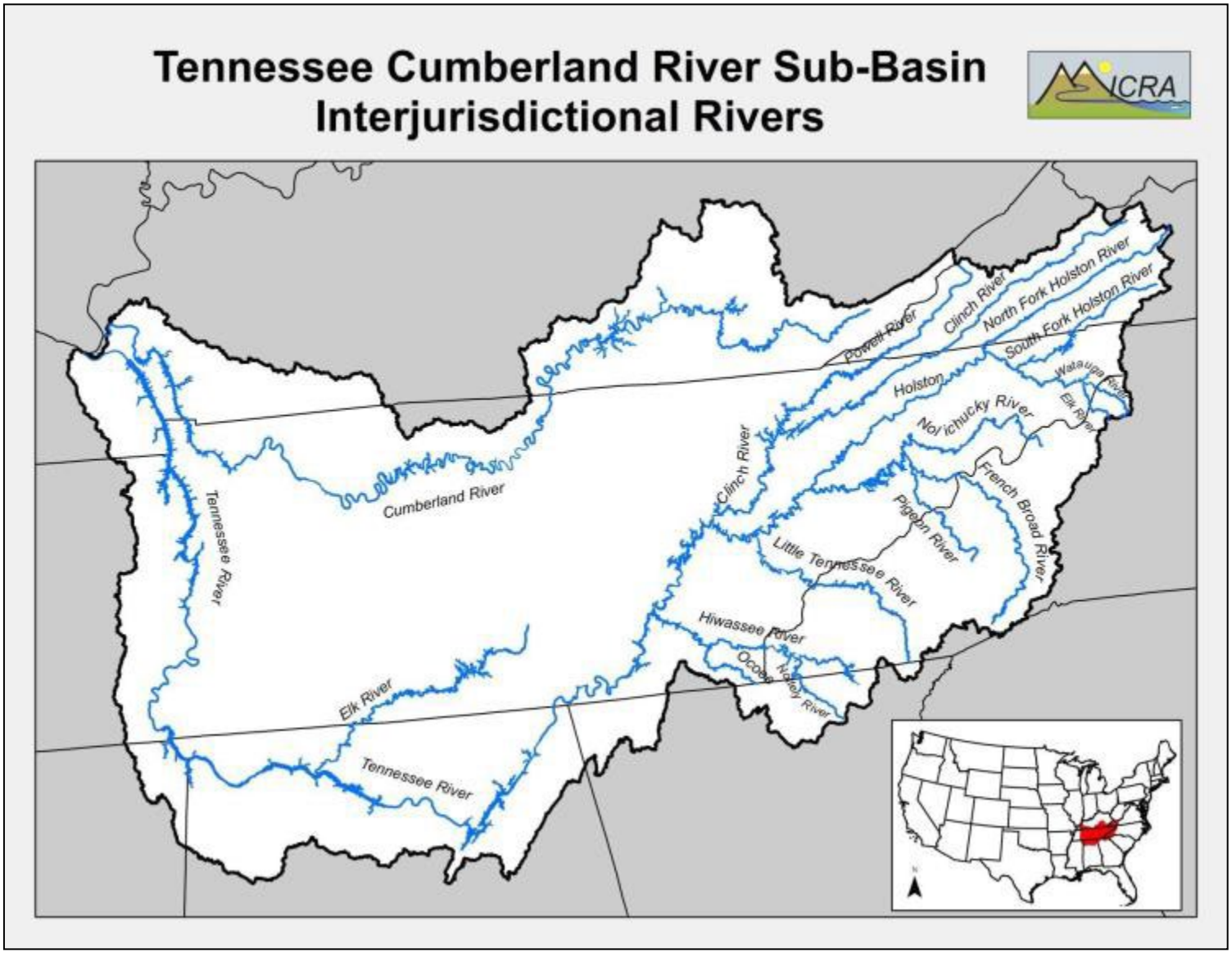


Figure 17. Select 6th order and larger interjurisdictional rivers of the Tennessee-Cumberland Rivers Sub-basin.

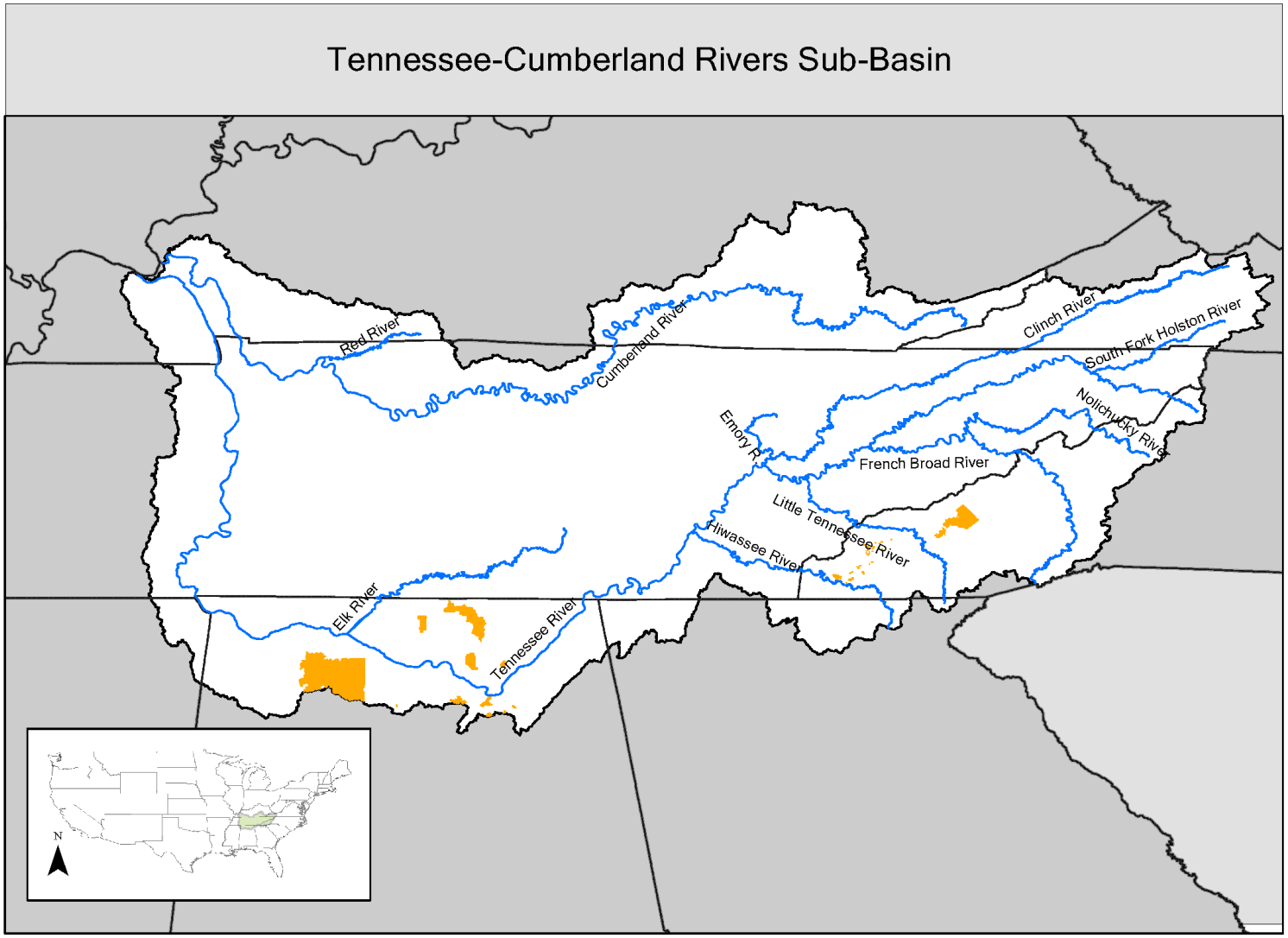


Figure 17. Select 6th order and larger interjurisdictional rivers of the Tennessee-Cumberland Rivers Sub-basin. Orange polygons indicate tribal territories.

Upper Mississippi River Sub-Basin

Mississippi Interstate Cooperative Resource Association

Geography

The Upper Mississippi River (UMR) sub-basin drains approximately 189,000 square miles from eight states. The basin's namesake begins at Lake Itasca in northern Minnesota. The southern end of the sub-basin is the confluence of the Ohio River at the southern tip of Illinois, roughly 1,300 miles and over half of the length of the entire Mississippi River.

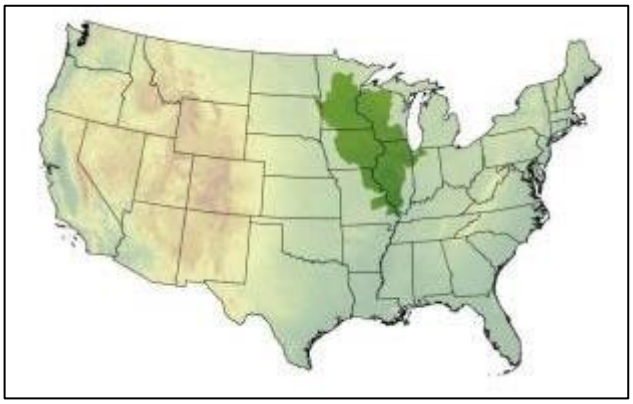


Figure 18. The Upper Mississippi River Sub-Basin, or watershed, includes rivers and lakes from 8 states.

A series of 29 commercially navigable locks and dams, most built in the 1930's, extend about 690 miles on the Mississippi River from Minneapolis, MN to St. Louis, MO. Locks and dams are also located on the Illinois River. Collectively, commercial navigation exists on > 1,200 miles of the UMR interjurisdictional rivers, carrying in excess of 201,000 tons of cargo annually (University of Kentucky and University of Tennessee, 2014).

The UMR also supports > 285,000 acres of federal refuges within its floodplain. Partner states manage another 140,000 acres of land along the river. These public lands contribute to a UMR visitation exceeding 10 million trips annually, more than most national parks, including Yellowstone. This dual commercial navigation and environmental land base contributed to Congress recognizing the Upper Mississippi River as a "nationally significant ecosystem and a nationally significant commercial navigation system" (WRDA 1986).

Economics

Commercial harvest of fish within the UMR sub-basin has averaged over 8.5 million pounds, resulting in an estimated value of > $2.049 million annually. The Mississippi River alone supports over 6.2 million recreational fishing trips annually within counties bordering the UMR generating over $448.6 million in estimated 2011 retail sales and $723.2 million in estimated 2011 industrial output (U.S. Fish and Wildlife Service: Division of Economics 2015).

Figure 19. Congress has designated the UMR as, "a nationally significant ecosystem and a nationally significant commercial navigation system." (WRDA 1986).

Problem Statement/Greatest Needs

The UMR is a large and dynamic ecosystem that has been greatly altered by commercial navigation, flood control, and land use throughout its watershed. The ecosystem remains under considerable stress and still faces many challenges, including sedimentation, nutrient loading, invasive species, altered hydrology and floodplain isolation. The UMR sub-basin's connection to the Great Lake via the Chicago Sanitary and Ship Canal poses a vector for inter-basin transfer of a variety of invasive species the poses a risk to the entire Mississippi River basin.

Habitat quality of the large rivers in the UMR sub-basin have been degraded due to commercial navigation, levee construction, urban development, and sedimentation from agricultural runoff. The impacts are not uniform throughout the sub-basin. For example, agricultural levees, which have reduced fishery access to critical floodplain habitats, are most pronounced in the states of IA, IL, and MO. However, sedimentation and impacts from commercial navigation and its maintenance are issues in all the states.

Figure 20. Sediment from the Root River, MN, entering the Mississippi River.

Existing Partnerships/Plans

Planning to protect and restore native fish species of the UMR sub-basin's interjurisdictional rivers has a long history involving many state and federal agencies and the public. The first comprehensive plans were recommendations developed by the forts Great River Environmental Action Team (GREAT) (GREAT 1980) which resulted in more environmentally acceptable dredging practices that protected fish and wildlife habitat. Many more plans have followed, some of which are briefly described under the accomplishments of the various UMR partnerships. All the planning efforts have built upon the experience and knowledge gained over even a relatively short time frame in what is often referred to as an adaptive management approach.
Several inter-agency partnerships exist within the UMR. The most notable partnerships are those established for coordinated management of the Mississippi River's ecosystem restoration and commercial navigation.

Upper Mississippi River Conservation Committee (UMRCC)

The UMRCC was established in 1943 with the purpose of conducting a 3-year fish survey. However, once the survey was completed, the biologists recognized the need for continuance of the organization to collectively address conservation issues. The UMRCC is comprised of UMR managers, biologists and scientists with several technical sections. In 2002, the UMRCC prepared a 50-year estimate of ecosystem restoration costs for the UMR and Illinois River (UMRCC 2002). This estimate was based on floodplain habitat needs presented in the Corps of Engineers Habitat Needs Assessment (USACE 2000) supplemented with needs identified in Environmental Pools Plans (River Resources Forum 2004) and used costs from completed projects to estimate future funding needs. The UMRCC Fisheries Technical Section developed a fisheries plan in 2010 (UMRCC 2010) to identify the needs and priorities for a healthy UMR fishery.

Upper Mississippi River Basin Association (UMRBA)

The UMRBA has been designated by Congress as the “caretaker of the master plan” (WRDA 1986). The master plan referred to is the Upper Mississippi River System Master Plan (Upper Mississippi River Basin Commission 1982), which provided justification that led to the authorization of the UMRR. The UMRBA is a regional interstate organization formed by the Governors of Illinois, Iowa, Minnesota, Missouri, and Wisconsin to coordinate the states' river-related programs and policies and work with federal agencies that have river responsibilities. UMRBA is involved with programs related to commercial navigation, ecosystem restoration, water quality, aquatic nuisance species, hazardous spills, flood risk management, water supply, and other water resource issues. The purpose of the Upper Mississippi River Basin Association is to facilitate dialogue and cooperative action regarding water and related land resource issues.

Upper Mississippi River Restoration (UMRR)

The Upper Mississippi River System Master Plan led to legislation authorizing the Upper Mississippi River System Environmental Management Program in WRDA 1986. EMP was initially authorized at $19.3 million for a period of 15 years. In 1999, EMP was reauthorized as a continuing authority with an appropriation limit of $33 million, however, since reauthorization, appropriations have averaged about $20 million per year. One third of the funding is allocated for Long Term Resource Monitoring with 2/3 allocated for Habitat Rehabilitation and Enhancement Projects on the Upper Mississippi River and Illinois Rivers. Restoration projects implemented under EMP where, and continue to be, selected by interagency teams of river managers who identify, nominate and sequence projects for implementation. Project planning and construction is led by the Corps of Engineers. Habitat projects are identified by resource managers throughout the system. The projects are sequenced through a hierarchy of interagency river teams geographically defined by the 3 Corps of Engineer Districts. The UMRR completed a Habitat Needs Assessment in 2000 to identify existing quality habitat and identify systemic needs for a variety of species (USACE 2000). An update of the Habitat Needs Assessment was initiated in 2016.

Corps of Engineer’s Regional Coordination

The UMR sub-basin lies within the boundaries of several Corps of Engineer Districts. Three of the districts, St. Paul, Rock Island and St. Louis, manage commercial navigation and environmental restoration on the Mississippi, Illinois, St. Croix, Kaskaskia, and Minnesota Rivers. Each of these districts has regional coordination teams established to solicit partnership expertise and input on a variety of issues.

Examples of Completed Habitat Restoration

The UMR Sub-basin partnership programs have led to the development and implementation of large river fisheries habitat restoration actions on the Mississippi and Illinois Rivers. The UMRR authorization has implemented 55 Habitat Rehabilitation and Enhancement Projects since 1986, accounting for the majority of fisheries related habitat work within the UMR sub-basin. Over half of the UMRR habitat projects have directly benefited interjusridictional fish. Additional improvements in habitat have been accomplished through other federal or state programs, but

to a much smaller scale and overall impact. However, even these restoration measures are not keeping up with the continued loss of habitat due to impacts of managing the UMR system for commercial navigation and impacts of sedimentation from upland sources.

The variety of techniques implemented under UMRR HREPs, and successful outcomes, provide examples of what can be done elsewhere within interjurisdictional rivers of the Mississippi River basin.

Figure 21: Restoration of habitat at Spring Lake, near Buffalo City, WI, is one example of the type of management actions implemented under authority of the Upper Mississippi River Restoration Program. Impoundment of the Mississippi River in the 1930's created many islands within the floodplain (1954). Over time, the islands eroded away, resulting in a loss of habitat quality for a variety of fish species (1991). Islands were constructed in 2005-2006 with sediments dredged from within a 600-acre backwater to restore habitat for a variety of fish species (2015).

Implementation Needs

Implementation mechanisms are in place for habitat management of aquatic resources. However, funding levels have often fallen below authorization amounts. Implementation needs for the UMR sub-basin include:

1. Full funding of the UMRR and COE channel maintenance programs would provide the ability to implement successful restoration projects at multiple scales.
2. Full funding of NRCS watershed initiatives to reduce sediment delivery to the Mississippi River and its tributaries would slow the loss of habitat and prolong the life of habitat projects under other authorities.

Partnerships that exist on the Mississippi River in this sub-basin do not have counterpart groups collectively working on the other rivers. Establishment of similar partnerships would promote greater coordination.

Table 10. Interjurisdictional rivers (6th order and larger) of the Upper Mississippi River Sub-basin.

Rivers	Stream Order	States	Tribal
Mississippi River	**10**	**MN, WI, IA, IL, MO**	
Minnesota (including Big Stone Lake)	**8**	**MN, SD**	
Whetstone	**6**	**SD, MN**	
St. Croix	**6**	**MN, WI**	
Chippewa[1]	**7**	**WI**	**x**
Black[1]	**6**	**WI**	**x**
Wisconsin[1]	**6**	**WI**	**x**
Rock	**7**	**IL, WI**	
Pecatonica	**7**	**IL, WI**	
Sugar	**6**	**IL, WI**	
Iowa[1]	**7**	**IA**	**x**
Des Moines	**7**	**IA, MN, MO**	
Illinois[2]	**8**	**IL**	
Kankakee	**6**	**IN, IL**	
Iroquois	**6**	**IN, IL**	
Fox	**6**	**WI, IL**	
Missouri	**9**	**MO, NE, SD, ND, MT, IA, KS**	**x**

[1] The Chippewa, Black, Wisconsin, and Iowa rivers flow through tribal lands.

[2] The Illinois River is not an interjurisdictional river, but it is formed by interjurisdictional tributaries.

Table 11. Select ecological and economic statistics for the Upper Mississippi River Sub-basin.

Upper Mississippi River Sub-basin	
Watershed (square miles)	189,000
Number of Interjurisdictional Rivers	16
Number of States within Sub-basin	8
Number of Fish/Mussel Species	150/38
Number of Endangered Fish/Mussels	1/4
Value of Recreational Fishery (millions)	$5,690.1
Value of Commercial Fisheries (millions)	$2.049
Commercial Fisheries Harvest (lbs.)	8,491,925
2011 Commercial Navigation (tons)	201,000

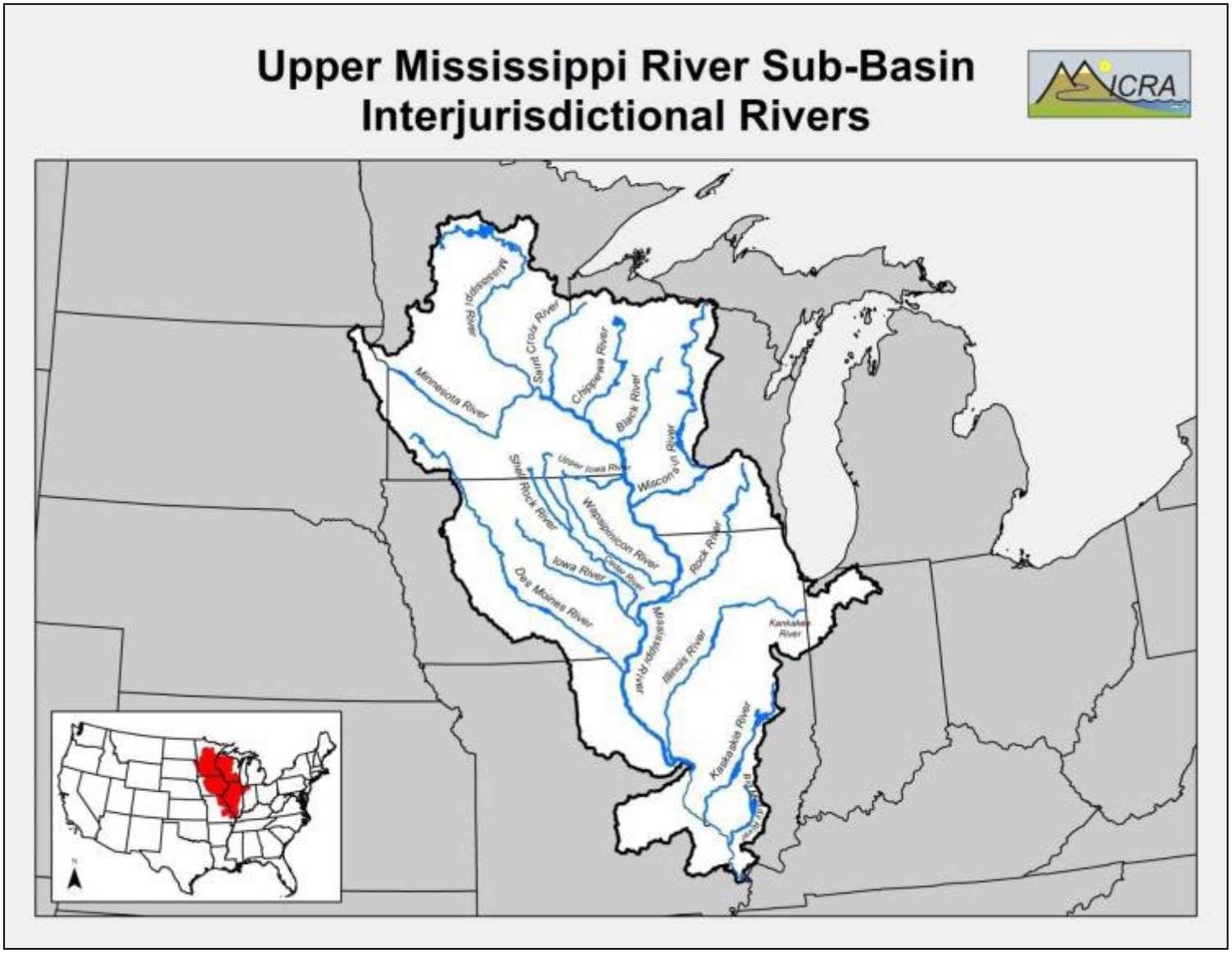


Figure 22. Select 6th order and larger interjurisdictional rivers of the Upper Mississippi River Sub-basin.

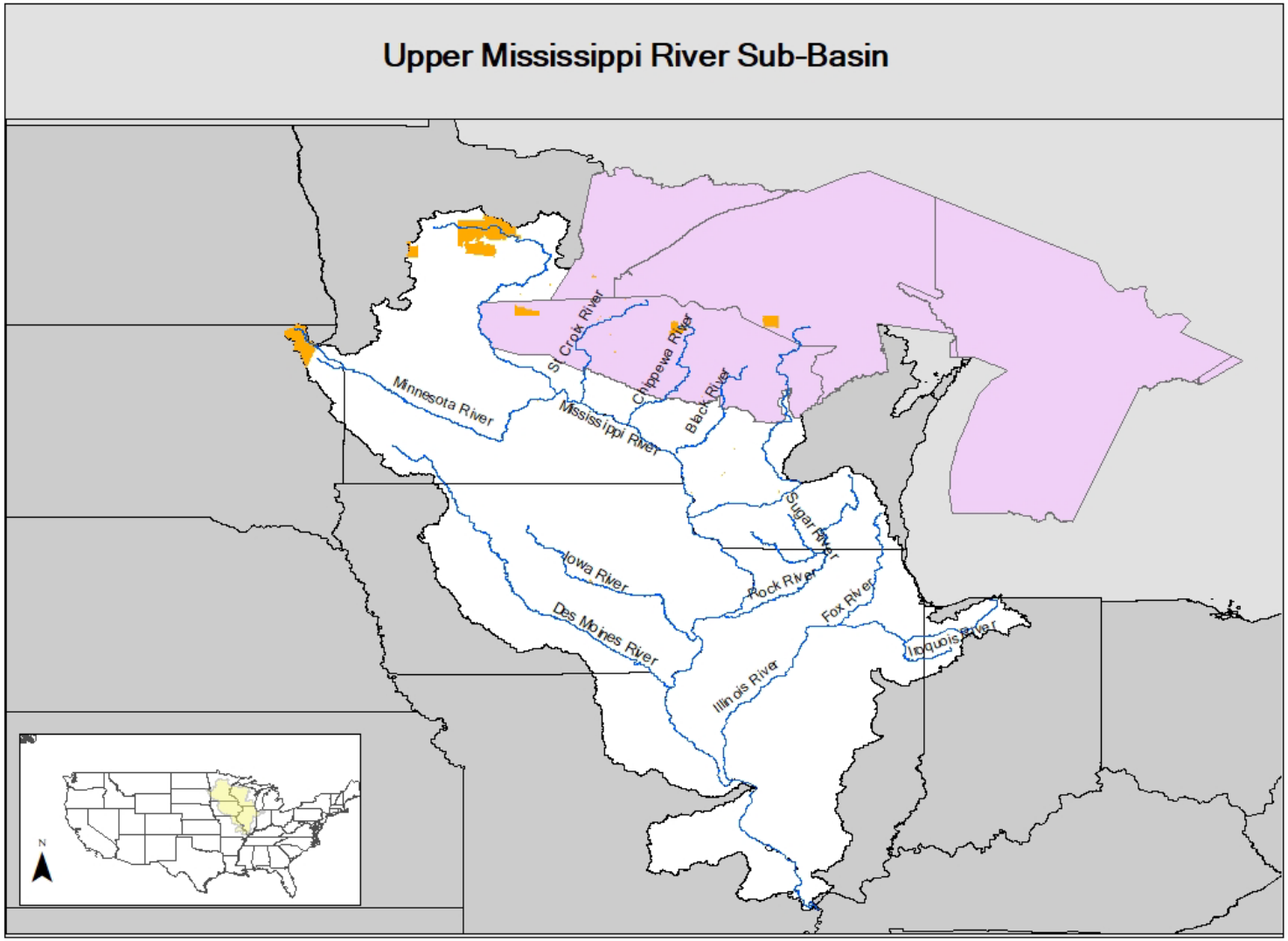


Figure 22. Select 6th order and larger interjurisdictional rivers of the Upper Mississippi River Sub-basin. Orange polygons indicate tribal territories. Pink areas represent the territories that were ceded by tribes of the Ojibwe to the U.S. government in the treaties of 1836, 1837, 1842, and 1854.

Literature Cited

Great River Environmental Action Team. 1980. Great I – A study of the Upper Mississippi River volume 1 – Main report. Great River Environmental Action Team, Twin Cities, MN. 89 pp.

University of Kentucky and University of Tennessee. 2014. Inland Navigation In The United States: An Evaluation Of Economic Impacts And The Potential Effects Of Infrastructure Investment. Sponsored by: National Waterways Foundation. http://www.nationalwaterwaysfoundation.org/documents/INLANDNAVIGATIONINTHEUSDECEMBER2014.pdf

Upper Mississippi River Basin Commission (UMRBA). 1982. Comprehensive Master Plan for the Management of the Upper Mississippi River System. Upper Mississippi River Basin Commission, Minneapolis, Minnesota. (Note: The Upper Mississippi River Basin Commission is now the Upper Mississippi River Basin Association) http://www.umrba.org/masterplan.htm

Upper Mississippi River Conservation Committee. 2002. A Preliminary Description of Habitat Objectives (And Estimated Costs) Needed to Achieve a Desired Level of Ecosystem Integrity on the Upper Mississippi River System: Preliminary Report. Rock Island, IL. 21 pp. http://www.umrcc.org/Reports/Prelim%20Descrip%20of%20Habitat%20Obj%20and%20Costs%20for%20UMRS.pdf

Upper Mississippi River Conservation Committee. 2010. Upper Mississippi River fisheries plan 2010. Upper Mississippi River Conservation Committee. – Fish Technical Committee. Onalaska, WI. 36pp. http://www.umrcc.org/Reports/Fish%20Section/FishPlanFinalcompressed.pdf

U.S. Army Corps of Engineers. 2000. Upper Mississippi River System Habitat Needs Assessment: Summary Report 2000. U.S. Army Corps of Engineers, St. Louis District, St. Louis, Missouri. 53 pp. http://www.mvp.usace.army.mil/Portals/57/docs/Navigation/River%20Resource%20Forum/EnviroPoolPlansfinal_1.pdf

U.S. Army Corps of Engineers. 2011. Upper Mississippi River Ecosystem Restoration Objectives. U.S. Army Corps of Engineers, Rock Island District, Rock Island, IL. 87pp. http://www2.mvr.usace.army.mil/UMRS/NESP/Documents/UMRS%20Ecosystem%20Restoration%20Objectives%202009%20Main%20Report%20(1-20-2011).pdf

U.S. Fish and Wildlife Service: Division of Economics. 2015. Upper Mississippi River Economic Assessment Part 1: 60 County Assessment. Division of Economics, US Fish and Wildlife Service, 5275 Leesburg Pike, MS: BMO, Falls Church, VA 22041

Appendix – Potential Management Actions and Example Projects for Implementation by MICRA Sub-basin

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
Maintain and enhance high quality habitats and habitat diversity	• Avoid and minimize degradation of aquatic habitats through best management practices for watershed management, shoreline stabilization, channel training structure modifications, and acquisition of land/easements from willing private landowners • Enhance and restore secondary channels, off-channel aquatic areas, and other critical habitats (e.g., cross- overs; riffle pools; mussel beds; isolated wetlands; spawning, nursery, and over-winter habitat; etc.) requiring special protection or acquisition to increase habitat diversity	• Acquisition/Easements from willing landowners • Aeration channels/culverts • Aquatic vegetation/trees • Avoid and minimize impacts of dikes on sedimentation over gravel bars • Avoid closure dikes in secondary channels • Avoid impacts to tributary mouths • Bank stabilization • Closing structures • Construct chevrons • Construct hardpoints • Construct isolated wetlands • Construct/restore gravel bars • Construct/restore islands • Dechannelization • Dredging • Embankment modifications • Fluctuation zone seeding • Forest management • Improve littoral zone habitat • Levee setbacks • LUNKER structures • Modification/removal of channel training	• ***AR**: Restore five oxbow lakes (Clark Creek, Tubbs Creek, Hicks, Deep Bank, and Horseshoe) in the lower White River using low- crest weirs* • ***LA**: Utilize selective herbicides to treat invasive aquatic vegetation in Red River Raft lakes to enhance fish and mussel habitat* • ***LA**: Reforest bottomland hardwoods and restore native plant communities in the Red River National Wildlife Refuge* • ***AR**: Conduct habitat enhancement projects throughout the range of the Ouachita rock pocketbook and Rabbitsfoot mussels* • ***AR**: Perform 200 dikes notches identified during the Arkansas River navigation study* • ***CO**: Improve trout habitat on Grape Creek in the Arkansas River sub-basin within 1 mile both above and below DeWeese Reservoir using boulder and log structures* • ***OK**: Notch dikes along Arkansas River Navigation System identified during the*	• ***AR**: Perform 200 dikes notches identified during the Arkansas River navigation study* • ***AR**: Island 25 Bend; Increase flow through Bend of Island 25 point bar to increase depth diversity and water quality (AR03)* • ***KY**: Wolf Island Secondary Channel, Restore connectivity and flow to Wolf Island secondary Channel (KY07)* • ***LA**: Wilson Point Dikes; Improve habitat diversity within the Wilson Point dikes. (LA04)* • ***MO**: Donaldson Point; Enhance flow through the dikes in the area east of Donaldson Point. (MO11)* • ***MS**: Old White River Chute; Restore flow into Old White River Chute to improve habitat diversity. (MS31)* • ***TN**: Armstrong Bar Hydrology; Restore the secondary channel behind Armstrong Bar dikes and reconnect the channel to the river. (TN27)*	• ***NE, IA, KS, MO:** Evaluate current side channel habitat entrance/exit structures for larval drift capture.* • ***NE, IA, KS, MO:** Modification of existing training structures to enhance larval drift and fish passage.* • ***MT**: Continuation of Channel Migration Easement program to pay landowners to preclude bank hardening in order to allow natural channel migration in the lower Yellowstone River. First agreement about to be signed with a landowner near Sidney, MT.* • ***NE, IA, KS, MO:** Renewed emphasis on 100,000 acres of mitigation habitat authorized by WRDA still owed to Missouri River Basin states.* • ***IA, NE:** Continuation of Revetment lowering projects such as at Lower Decatur (Missouri River Mile 687) and Three Rivers (Missouri River Mile 670)* • ***IA:** Continuation of channel widening projects such as Deer Island (Missouri River*	• ***OH**: ORM 373.2-372, 358.3-357, 226.2-225.5 T Dikes* • ***PA**: ORM 1.6-2.4 Brunot Island Backchannel Habitat Restoration* • ***PA**: ORM 20.0-22.0 Ohio River shallow water creation and enhancement* • ***PA**: ORM 20.0-21.0 Deepwater pool habitat enhancement* • ***WV**: ORM 288.2-287.8 Greenbottom revetments* • ***WV**: ORM 126.9 Hannibal Dam Tailwaters revetments* • ***IL**: ORM 902.3 Lusk Creek Embayment* • ***IL**: ORM 911 Barren Creek Embayment* • ***IN**: ORM 840.7 Hovey Lake restoration* • ***IN**: ORM 494.8 Tanners Creek Embayment* • ***KY**: ORM 530.3 Craigs Creek Embayment* • ***WV**: ORM 147.8 Bens Run Embayment 1 and 2*	• ***TN**: Highest priority sub- basins projects to maintain quality freshwater mollusk habitats are: Upper Duck, Upper Elk, Collins, South Fork Cumberland, Emory, Obey, Sequatchie, Stones, Holston, and Lower French Broad rivers* • ***TN**: Highest priority sub- basins projects to restore freshwater mollusk habitats from altered hydrological impacts are: Upper Clinch, Powell, North Fork Holston, Upper Duck, Upper Elk, South Fork Cumberland, Lower Tennessee, Lower Clinch, and Holston rivers* • ***TN**: Be proactive in establishing watershed organizations to foster appropriate land use and other human interaction on the landscape* • ***TN**: Design in-stream flow prescriptions for tributaries at risk of excessive water withdrawal*	• ***MN**: RM 747: Weaver Bottoms, Pool 5: restore/enhance bathymetric diversity by dredging an historic backwater lake* • ***MN**: RM 827: Grey Cloud Slough Reconnection, Pool 2: restore water flow into Grey Cloud Slough by installing a bridge to replace plugged culverts* • ***MN**: RM 798: Lower Vermillion River Water Quality and Aquatic Habitat Enhancement Project, Pool 4: improve water quality and aquatic vegetation abundance and diversity by restricting common carp access to backwater lakes through restoration of floodplain levees* • ***IA**: RM 667: Conway Lake HREP, Pool 9: restore and enhance fisheries and waterfowl habitat by enhancing bathymetric diversity by dredging.* • ***IL**: RM568: Pool 12 Overwintering HREP: restore and enhance fisheries and waterfowl habitat by enhancing bathymetric diversity by dredging.* • ***WI**: St. Croix River: installation of 200 fish*

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
		structures • Modification of dam operations • Partial closing structures • Restore secondary channels • Riffle/pool structures • Sediment traps • Seed Islands • Shoreline stabilization • Substrate modification (i.e., convert from silt to gravel) • Tree drops/woody structure • Wing dam notching	*navigation study. Primarily those areas identified above L&D 17* • ***OK**: Application of specific herbicide or other treatments to eradicate alligator weed in the Arkansas River system* • ***TX:** Utilize herbicides and biological control to treat invasive aquatic vegetation.* • ***TX:** Deploy artificial fish habitat structures to improve available fish habitat in reservoirs.*		*Mile 672).* • ***NE**: Renewed emphasis on increasing floodplain connectivity such as Highway 2 setback near Nebraska City, NE.* • ***NE:** reconnect chute behind Islands #4* • ***Basin Wide:** Educate the public on the economic benefits of a healthy Missouri River ecosystem which can return more ecosystem goods and services than the present management model and reduce repetitive federal bailouts by the U.S. taxpayer which have been running in the billions.* • ***NE, IA, KS, MO:** Educate the public on the outdoor recreational opportunities provided by 61,000 aces of mitigation lands open to the public in the four lower states.*			*cribs per year placed in colonies in Lake St. Croix*

Appendix – Potential Management Actions and Example Projects for Implementation by MICRA Sub-basin

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
Manage sediment transport	• Support watershed initiatives to reduce/eliminate watershed induced degradation of aquatic habitats and ecosystem functions • Promote restoration of a sediment transport regime such that transport, deposition, and erosion rates are within acceptable limits	• BMPs • Acquisition/easements • Buffer strips • Islands • Breakwaters • Sediment traps • Dechannelization • Restore tributary mouth • Minimize gravel dredging permits	• ***AR**: Restore the Rector Brake backwater of the Arkansas River* • ***AR**: NER Alternative F, Sediment control at the mouth of the Cache River* • ***AR**: Conduct stream bank restoration projects along the Red River near Spring Bank Ferry*	• ***AR**: Restore the Rector Brake backwater of the Arkansas River* • ***AR**: Island 88; Deepen the mouth of the oxbow channel behind Island 88 unless it will drain water from the lake. (AR57)* • ***KY**: Putney Bend Dikes; Increase flow through two Putney Bend dikes at the head of the sandbar to maintain depth diversity. (KY05)* • ***LA**: Browns Field Dikes; Increase flow through* • *Brown's Field dikes that would maintain the slack water habitat along the main channel. (LA24)* • ***MO**: Old and New #7 Chutes; Increase depth diversity of Old #7 Chute. Reduce sedimentation into the chutes. (MO08)* • ***MS**: Rodney Lake Assessment; Restore hydrology in the lake. Reduce sedimentation and enhance depth diversity. Protect the population of Potamilus capax in the chute. (MS65)*	• ***NE, SD**: Lewis and Clark Lake Study* • ***Basin Wide:** Missouri River Recovery Program efforts* • ***SD**: Support projects identified through WRDA 2000 Title IX Sedimentation Task Force. Directs and develops projects reducing or addressing sedimentation issues on the Missouri River.* • ***ND**: Support projects identified through WRDA 2000 Title VII Sedimentation Task Force. Directs and develops projects reducing or addressing sedimentation issues on the Missouri River.* • ***KS, MO:** Bed degradation study in the Kansas City Reach of the Missouri River.* • ***NE, SD**: Sedimentation study in the 39 mile and 59 mile reaches of the Missouri National Rec River, especially at the mouth of the Niobrara River.* • ***MT, ND, SD, NE:** Study Hydro-Peaking along the dams in the Missouri River to look for alternatives for more natural sediment*		• ***TN**: Highest priority sub- basins projects to restore freshwater mollusk habitats from sediment related impacts are: Upper Clinch, Powell, North Fork Holston, Upper Duck, Upper Elk, South Fork Cumberland, Lower Tennessee, Lower Clinch, and Holston rivers* • ***TN**: Riparian restoration projects in tributaries* • ***TN**: Work with NRCS to identify and promote participation in private land conservation programs*	

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
				• ***TN**: Island 35/Densford Bar Acquisition; Acquire Island 35. Restore habitat diversity in several disjunct channel between the river and levee on the AR bank. (TN20)*	*transport.*			

Appendix – Potential Management Actions and Example Projects for Implementation by MICRA Sub-basin

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
Restore main stem and tributary hydrology	• Implement changes to dam operating procedures and water level management techniques that facilitate more natural hydrographs and temperature regimes (i.e., reduced daily fluctuations) • Develop and implement watershed management actions to facilitate more natural hydrographs	• Pool-wide water level management • More frequent operation of gates • Tributary wetland restoration • Urban runoff retention ponds • Buffer strips • Reduction in hydro- power peaking • Minimize severe fluctuations during spawning periods • Modification of intake structures and water release regimes at coldwater tailrace releases	• ***LA**: Operate Lock and Dams 1 through 5 on the Red River to derive maximum full pool benefits* • ***AR**: Develop an instream flow agreement on the Fourche La Fave River, a tributary of the Arkansas River, to enhance alligator gar spawning habitat* • ***OK**: Treatment of phosphorous discharge from Lake Francis into Illinois River designed to reduce limits to within acceptable state standards* • ***OK**: Modification of existing water release regimes at coldwater tailraces, including the Lower Illinois River, to improve downstream water quality conditions*	• ***AR**: Basket Bar; Enhance habitat diversity below dikes. Enhance flow to side channel. (AR18)* • ***KY**: Mayfield Creek; Improve access to Mayfield Creek by removing sediment plug near the mouth of the creek. (KY01)* • ***LA**: Natchez Island Dikes; Increase flow through dike field. (LA30)* • ***MO**: Birds Point Sandbar; Enhance flow through a series of dikes near the mainland to isolate the sandbar from the mainland to benefit least tern nesting. Increase flow through a secondary channel. (MO01)* • ***MS**: Black Bayou; Assess the need to restore habitat diversity in Back Bayou Drainage Ditch. (MS36)* • ***TN**: Mouth of Hatchie River Acquisition; Install grade control structures to control headcutting that is occurring in the Hatchie River. (TN18)*	• ***MT**: Ft. Peck warm-water release studies* • ***MT, ND, SD, NE:** Study Hydro-Peaking along the dams in the Missouri River to look for alternatives for more natural sediment transport and flows.* • ***NE**: Protect instream flows on the lower Platte River and Niobrara River in Nebraska for the fish communities to include pallid sturgeon, least tern, and piping plover. Protect flows for whooping crane on the lower Niobrara. Both rivers are important tributaries to the Missouri River.* • ***NE**: Enhance connectivity of the floodplain to the river, especially on mitigation projects and increase wetlands to help absorb excessive nutrients in the river (Highway 2 setback at Nebraska City, NE).* • ***SD**: Study Hydro-Peaking below Fort Randall Dam where flows frequently go to zero in the Missouri National Recreation River 39-mile reach.*		• ***TN**: Highest priority sub-basins projects to restore freshwater mollusk habitats from altered hydrological impacts are: Upper Clinch, Powell, North Fork Holston, Upper Duck, Upper Elk, South Fork Cumberland, Lower Tennessee, Lower Clinch, and Holston rivers* • ***TN**: Identify and fund TNSMP projects*	***IA**: RM 432: Blackhawk Bottoms, Pool 19: restore/increase habitat diversity (aquatic and terrestrial) through capturing the flow of a small creek for moist soil management, increasing topographic diversity and water level management within the Blackhawk Bottoms. The area will inundate from the Mississippi and the small creek to provide fish spawning areas*

Appendix – Potential Management Actions and Example Projects for Implementation by MICRA Sub-basin

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
Restore hydraulic and habitat connectivity	• Enhance lateral connectivity to the current and historic floodplain using a variety of techniques on publicly owned properties and willing private ownerships • Increase longitudinal migration opportunities for fish through changes in dam operations and fish passage structures at dams and other human induced barriers	• Fish passage structures/measures • Levee modification • Levee removal • Dechannelization • Dredging • Aeration channels/culverts • Channel formation • Change in moist soil operating plans • Modify water intake structures to reduce or eliminate entrainment and impingement	• ***AR**: Re-establish connectivity to the Coal Pile backwater, Arkansas River* • ***AR**: Install fish ladders for American eel on Dam 2 of the Arkansas River, Montgomery Point Lock and Dam on the White River, and the Huxtable pumping plant* • ***AR**: NER Alternative G, Restoring connectivity in lower portion of the Cache River* • ***AR**: Install large box culverts at road crossings along the Sulphur River, a tributary of the Red River, to improve connectivity to upstream alligator gar spawning habitat* • ***CO**: Restore connectivity of the Arkansas River in the lower Arkansas River between Pueblo and John Martin Reservoir where diversion structures create barriers to native fish movements and reproductive strategies, with a focus on Plains Minnow recovery. Prioritize barriers, and develop strategies for removal or retrofitting with fish passages*	• ***AR**: Re-establish connectivity to the Coal Pile backwater, Arkansas River* • ***AR**: Install fish ladders for American eel on Dam 2 of the Arkansas River, Montgomery Point Lock and Dam on the White River, and the Huxtable pumping plant* • ***AR**: Corona Lake; Install a weir at lower end of the lake to maintain water level. (AR10)* • ***LA**: Old River RM503; Restore hydrology and connectivity to maintain seasonal connection at Old River. (LA03)* • ***MO/KY**: Channel Behind Wolf Island; Restore flow through the small secondary channel on the MO/KY state line. (MO05/KY08)* • ***MS/LA**: Bunch's Cutoff; Restore hydrology and connectivity to maintain seasonal river connection. Protect a least tern nesting area at RM 503. (MS44/LA02)* • ***TN**: Robert E. Everett Lake. Reconnect the lake to the river. (TN06)*	• ***IA**: Continuation of top width widening and levee setbacks such as at Deer Island and Copeland Bend* • ***MO**: Removal of Lock and Dam 1 on Osage River* • ***MO:** Notch Island 1 dikes for backwater flow* • ***MO**: Lake of the Ozarks barrier net* • ***MT**: Modification of Yellowstone River Intake Diversion structure* • ***IA, KS, MO, NE**: Acquire an additional 200,000 acres of high risk, flood prone meander belt/floodplain habitat to facilitate floodwater conveyance and connectivity in areas that are pinch points for flow, especially between Sioux City and Kansas City.* • ***IA, KS, MO, NE**: Identify pinch points by river mile between Sioux City, IA and Saint Louis, Mo. Educate the public on the advantages of the federal levee setback at Copeland Bend in western Iowa near Nebraska*	• ***IN**: ORM 813.1 Logsden-Stroud Branch Embayment / Frenchmans Slough*	• ***TN**: Highest priority sub-basins projects to restore freshwater mollusk habitats from altered hydrological impacts are: Upper Clinch, Powell, North Fork Holston, Upper Duck, Upper Elk, South Fork Cumberland, Lower Tennessee, Lower Clinch, and Holston rivers* • ***TN**: Low head dam inventory and prioritization for removal*	***IA**: Rock Creek: remove two low head dams to allow upstream fish passage in the Little Cedar River watershed; a tributary to the Cedar River*

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
			structures • ***KS**: Improve fish passage over the 21st dam in the City of Wichita, reconnecting over 150 miles of the Arkansas River upstream of Wichita to Great Bend* • ***KS**: Utilize small stream culvert passage in much of the Arkansas Basin similar to projects previously completed in the Red Hills near Medicine Lodge* • ***OK**: Study to implement methods to prevent fish stranding below dams. (Grand River below Fort Gibson, tributary to Arkansas River)*		*City, Nebraska.*			

Appendix – Potential Management Actions and Example Projects for Implementation by MICRA Sub-basin

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
Restore floodplain geomorphology/landforms	• Restore or construct floodplain landforms (e.g., islands, seed islands, chevrons, reefs, etc.) in locations where floodplain structural diversity is needed to increase variability in flow patterns, sediment composition, bathymetry, and reductions in wind fetch • Increase the area of naturally functioning floodplain through acquisition and restoration of bottomland hardwoods, wetlands, and other floodplain habitats	• Acquisitions/easements from willing sellers • Bank protection • Bottomland forestry management • Bottomland vegetation management • Dredging • Island restoration/construction • Modification/removal of channel training structures • Procure batture land • Restore borrow pits • Restore lakes and backwaters • Seed islands		• ***AR**: Swan, Deep and Ozark Lakes; Rehabilitate habitat in the lakes. (AR39)* • ***KY**: Upper Island 1 Dikes (Backwater); Increase flow through Island 1 dikes and into a backwater. (KY02)* • ***LA**: Red River WMA Borrow Pits; Install gates/culverts in borrow pits on the Union Point Field property on the Red River to maintain water levels. (LA34)* • ***MO**: Near Little Cypress Bend; Deepen and diversify habitat in Twin Borrow Pits. Reduce siltation into the water bodies. Located on MDC property. (MO18)* • ***MS**: Yucatan Lake; Restore access to the lake from the river. Remove woody debris at the entrance, Project could include Middle Ground Island. (MS61)* • ***TN**: Shelby Forest Lakes; Opportunities near Corona Lake Complex, Island 37, and Centennial Island. Enhance a wetland complex encompassing Corona Lake and*	• ***IA, KS, MO, NE**: Modify or remove training structures within the channel to facilitate sand bar island deposition and other lost in-channel habitats.* • ***IA, KS, MO, NE**: Construct lost wetland and backwater habitats through the WRDA authorized 100,000 Mitigation acres still owed to the basin states.* • ***IA, KS, MO, NE**: Increase flow conveyance on the floodplain between large cities to assist with flood risk reduction and the extremes of anticipated climate change such as changes in runoff patterns and more frequent flooding.* • ***Basin Wide**: The Flood of 2011 satellite photo footprint should be studied to identify high risk, flood prone lands which could be acquired through the mitigation program under existing authorities and a willing seller basis.*	• ***IL**: ORM 928.0 Cottonwood Bar least tern habitat restoration* • ***KY**: ORM 784-780 Scuffletown Bottomland Hardwood restoration* • ***KY**: ORM 396 Lewis County Bottomland restoration* • ***OH**: ORM 356.5 Scioto River Floodplain* • ***OH**: ORM 223-225 Big Bend Floodplain*	• **TN**: Highest priority sub-basins projects to restore freshwater mollusk habitats from altered hydrological impacts are: Upper Clinch, Powell, North Fork Holston, Upper Duck, Upper Elk, South Fork Cumberland, Lower Tennessee, Lower Clinch, and Holston rivers • **TN**: River channel restoration • **TN**: TSMNP projects	• ***MN**: RM 695: Lower Root River Delta Restoration Project, Pool 8: restore/enhance floodplain habitat in the Root River delta by removing levees and restoring floodplain forests and wetlands.* • ***MN**: RM 797-807: North/Sturgeon Lake HREP, Pool 3: improve habitat diversity and quality by conducting a drawdown, building islands and dredging.* • ***IA**: RM 671: Upper Iowa River re-meandering, Pool 9: restore the meander to increase habitat diversity (aquatic and terrestrial) on the lower 4 miles of the channelized part of the Upper Iowa River and improve the river delta.* • ***IA**: RM 653: Harpers Slough HREP, Pool 9: restore and enhance fisheries and waterfowl habitat by enhancing bathymetric diversity by dredging and reestablishing islands that have eroded away. This project should affect a minimum of 1,877 acres*

Restoration Objective	Recommended Management Strategies	Potential Management Actions	Arkansas-Red-White Example Projects	Lower Mississippi River Example Projects	Missouri River Example Projects	Ohio River Example Projects	Tennessee-Cumberland Example Projects	Upper Mississippi River Example Projects
				Brandywine Chute, and reconnect Brandywine Chute to the river. (TN22; see AR10 and AR11)				