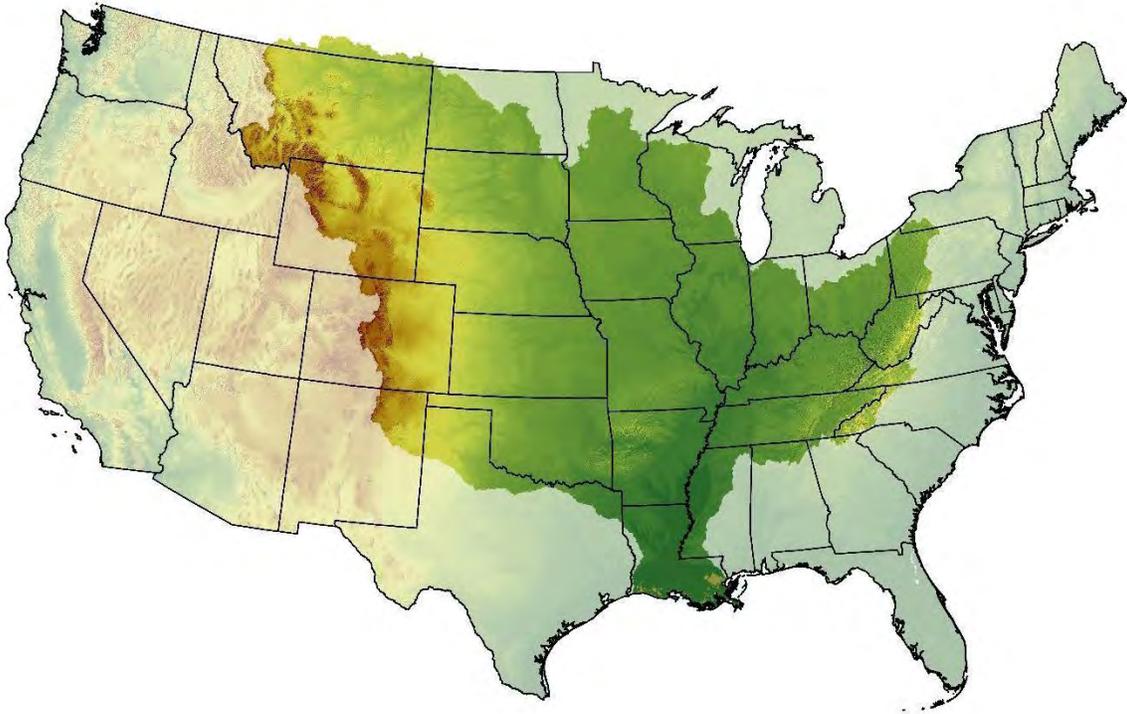


**A JOINT STRATEGIC PLAN
FOR MANAGEMENT OF
MISSISSIPPI RIVER BASIN FISHERIES**



Prepared by

Mississippi Interstate Cooperative Resource Association (MICRA)

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The Great Lakes Fishery Commission facilitated the development of '*A Joint Strategic Plan for Management of Great Lakes Fisheries*' by United States and Canadian fishery agencies as a commitment to cooperative fisheries management to protect and enhance Great Lakes fishery resources. With only minor modification since it was first ratified by the parties in 1981, the Joint Strategic Plan has become a time-tested and proven model for transboundary cooperation. Due to its comprehensive, forward-looking, and strategic nature, the Joint Strategic Plan is applicable to cooperative interjurisdictional fisheries management beyond the Great Lakes. MICRA is grateful for the work by the Great Lakes Fishery Commission, the Great Lakes fishery agencies, and all who contributed to the development of the Joint Strategic Plan that was used as a template for the development of '*A Joint Strategic Plan for Management of Mississippi River Basin Fisheries*'. Several portions of the Joint Strategic Plan have been used with little to no changes in this document.

Joint Strategic Plan Drafting Team Members

Timothy Bister, Texas Parks and Wildlife Department

Ron Brooks, Kentucky Department of Fish and Wildlife Resources

Brian Canaday, Missouri Department of Conservation

Greg Conover, U.S. Fish and Wildlife Service

Frank Fiss, Tennessee Wildlife Resources Agency

Chris Greene, Alabama Department of Conservation and Natural Resources

Neal Jackson, U.S. Fish and Wildlife Service

Jeff Janvrin, Wisconsin Department of Natural Resources

Robby Maxwell, Louisiana Department of Wildlife and Fisheries

Ricky Moses, Louisiana Department of Wildlife and Fisheries

Josh Nehring, Colorado Parks and Wildlife

Brad Parsons, Minnesota Department of Natural Resources

Bill Posey, Arkansas Game and Fish Commission

Larry Pugh, Mississippi Department of Wildlife, Fisheries, and Parks

Dennis Riecke, Mississippi Department of Wildlife, Fisheries, and Parks

Angeline Rodgers, U.S. Fish and Wildlife Service

Brian Schoenung, Indiana Department of Natural Resources

Randall Schultz, Iowa Department of Natural Resources

Rip Shively, U.S. Geological Survey

Chris Steffen, Kansas Department of Wildlife, Parks, and Tourism

Kasey Whiteman, Missouri Department of Conservation

Aaron Woldt, U.S. Fish and Wildlife Service

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Preface

By consent of Congress, and as directed by national law (i.e. Magnuson-Stevens Fishery Conservation and Management Act), sustainable marine fisheries within the U.S. coastal waters of the Pacific, Atlantic, and Caribbean Oceans, and the Gulf of Mexico, have been managed by multi-state commissions and fishery councils for many decades. The interjurisdictional and international fishery resources of the Great Lakes are cooperatively managed by the Great Lakes Fishery Commission (GLFC), operating through the 1954 Convention on Great Lake Fisheries. Management jurisdiction of the inland fishery resources of the Mississippi River Basin are shared by 31 states and 2 Canadian provinces. The basin supports economically and culturally significant subsistence, commercial, and recreational fisheries. Economic output from recreational fishing in the basin in 2011 exceeded \$19 billion (USFWS unpublished data). States within the Mississippi River Basin have formed multiple regional interstate partnerships, and one basin-wide partnership, to promote cooperation and communication among the conservation agencies to manage the interjurisdictional fishery resources of the basin. Despite the economic, ecologic, and social importance of the fishery resources in the Mississippi River Basin, and the complexity of managing sustainable fisheries with the multiplicity of resource management authorities, there are no interstate compacts or federal legislation to guide or facilitate cooperative fisheries management for the entirety of the basin.

Twenty-eight Mississippi River Basin state fishery agencies and the U.S. Fish and Wildlife Service (USFWS) ratified the Mississippi Interstate Cooperative Resource Agreement in 1990 and formed the Mississippi Interstate Cooperative Resource Association (MICRA) in 1991. The MICRA member agencies recognized the need for basin-wide, inter-agency collaboration in the establishment of shared management objectives, and the collaborative planning, implementation, and evaluation of management actions for the successful long-term biological and economic sustainability of interjurisdictional fisheries in the basin. To accomplish this level of cooperative, inter-agency management, formal state and federal agency commitments are necessary from each management authority in the basin, as well as long-term, stable funding to support coordination, implementation, and evaluation of management actions and associated research. With these goals in mind, the MICRA members desire to establish a Mississippi River Basin Fishery Commission (Commission).

Staff with the GLFC identified the development of *'A Joint Strategic Plan for Management of Great Lakes Fisheries'* (GLFC 2007) as paramount to the GLFC's success over the last four decades, and strongly recommended the development of a similar plan as a critical first step for the Mississippi River Basin. Based on the experience, success, and recommendations of several GLFC member agencies that are also MICRA member agencies, MICRA facilitated the collaborative development of *'A Joint Strategic Plan for Management of Mississippi River Basin*

Fisheries' to provide a more coordinated and structured approach for joint management of interjurisdictional fishery resources in the basin than is currently realized through the MICRA partnership.

A drafting team with representation from each MICRA sub-basin (i.e., Arkansas-Red-White, Lower Mississippi, Missouri, Ohio, Tennessee-Cumberland, and Upper Mississippi) and many MICRA member agencies was formed in 2018. The drafting team began by reviewing existing strategic planning documents for shared fishery resources developed by other inter-state commissions, compacts, and partnerships. A *Joint Strategic Plan for Management of Great Lakes Fisheries* effectively characterizes the need and product desired for the Mississippi River Basin and served as a model for the development of this Joint Strategic Plan. Input from MICRA member agencies was solicited through a questionnaire, review of draft documents, and face-to-face meetings.

The resulting Joint Strategic Plan is intended to be a practical tool for coordinating efforts of fishery agencies in the Mississippi River Basin to provide mutual benefits and protection of fishery and aquatic resources. MICRA does not consider the development of a basin-wide operational management plan a pragmatic endeavor. Rather, the Joint Strategic Plan is intended to serve as an umbrella document that provides a strategic framework under which operational plans can be developed and implemented for each of the sub-basins. Through the development of the Joint Strategic Plan, the MICRA member agencies developed a common goal statement, identified the key problem areas that must be addressed to comprehensively manage interjurisdictional fishery resources now and in the future, and identified broad strategies and strategic processes necessary to collaboratively resolve these complex issues.

of the world's exports in feed grains and soybeans, and most of the livestock and hogs produced nationally. Sixty percent of all grain exported from the U.S. is shipped on the Mississippi River through the Port of New Orleans and the Port of South Louisiana. To move goods up and down the Mississippi, the U.S. Army Corps of Engineers maintains a nine (9)-foot deep shipping channel from Baton Rouge, LA to Minneapolis, MN.

The basin supports vibrant and diverse sport and commercial fisheries. Economic output from recreational fishing in the basin in 2011, including associated impoundments, exceeded \$19 billion (USFWS unpublished data). Habitat degradation, invasive species, and the multiplicity of aquatic management authorities complicate and threaten the supply and utilization of these stocks. Fish species that move between management jurisdictions (i.e., interjurisdictional species) create complex resource management problems related to regulation development, licensing, enforcement, and establishment of management objectives. There are at least 90 fish species in the Mississippi River basin that can come under interjurisdictional management.

The MICRA partnership was formed to improve the conservation, development, management, and utilization of interjurisdictional fishery resources in the basin through improved coordination and communication among the responsible management entities. The goal in forming the partnership was that it would become an inland fishery commission and secure a stable funding source to support research and management of interjurisdictional, large river fishery resources. Although the vision of a Commission has not yet been realized, MICRA has been an active and effective forum for basin-wide coordination and communication among the fishery management agencies on the most significant fisheries management issues.

To provide for long-term, sustainable fishery resources and fishing opportunities into the future, a new model is needed for the basin. MICRA recognizes the need to move beyond coordination and communication, to a cooperative and structured approach for inter-agency planning, implementation, and evaluation of management actions to achieve collaboratively established management objectives for shared interjurisdictional fishery resources in the basin. Addressing research priorities to inform management, and inter-agency data sharing to support collaborative evaluation of management actions, are critically needed to effectively manage interjurisdictional fishery resources in the basin. Implementing cooperative research and management programs for shared fishery resources will require increased support and commitment of agency directors and administrators, the federal government, as well as a substantial, long-term, reliable, and sustainable funding source.

Joint Strategic Plan for Management of Mississippi River Basin Fisheries

The *Joint Strategic Plan for Management of Mississippi River Basin Fisheries* represents a formal commitment by the fishery management agencies within the basin to a set of strategic procedures for a coordinated, inter-agency approach to comprehensively manage self-sustaining interjurisdictional fishery resources in the basin now and in the future. The joint strategic plan is intended to serve as a foundational document for inter-agency fishery management in the Mississippi River Basin, under which tactical or operational plans will be developed and implemented for each of the sub-basin management units within the basin (Figure 2).

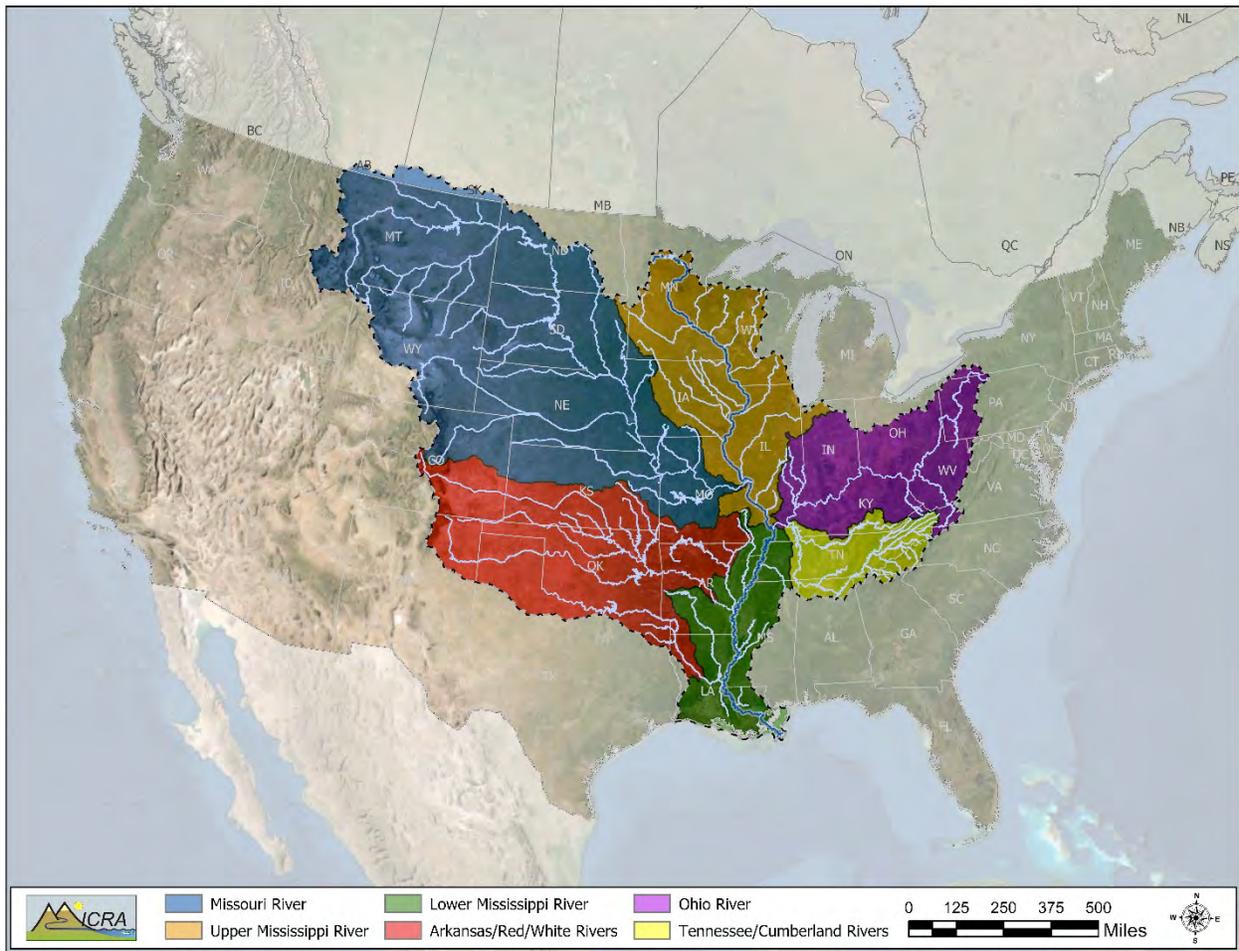


Figure 2. The Mississippi River and its interjurisdictional tributaries. The six MICRA sub-basin management units are indicated by the shaded backgrounds.

Common Goal Statement

To develop a common goal statement, the MICRA drafting team first compared each of the MICRA member agencies' mission statements and determined they possess common goals. Much overlap was noted among agency mission statements, with only a few minor differences. There were no direct conflicts. Based on agency mission statements, a common goal statement was developed to represent the shared intent of the member agencies regarding interjurisdictional fishery resources in the Mississippi River 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.

Mississippi River Basin Fishery Issues

Problem Area Identification:

To develop strategies for achieving the common goal of the Mississippi River Basin fishery management agencies, it is necessary to identify significant problem areas and emerging issues which limit each agency's ability. These problem areas must be addressed to comprehensively manage self-sustaining interjurisdictional fishery resources in the basin. MICRA members were asked to provide a brief description of the key problem areas affecting their agency's fishery management efforts within the basin. Responses from each agency were grouped into common themes and narratives were developed to describe four key problem areas: aquatic invasive species, inadequate resources for research and management of shared fisheries, habitat loss and degradation, and limited public and stakeholder involvement and support.

Problem Area 1: Aquatic Invasive Species

Aquatic invasive species (AIS), as defined in Executive Order 13112, are "alien [non-native] species whose introduction does or is likely to cause economic or environmental harm or harm to human health." They are nonindigenous or non-native species that threaten the diversity or abundance of native species and the ecological stability of infested waters. AIS also negatively impact the human use of aquatic resources including water supply and delivery systems for drinking water, hydropower, agriculture, aquaculture, other commercial purposes, and outdoor recreational activities dependent on such waters. In the United States, approximately 49% of the species on the threatened or endangered species lists are listed primarily because of predation or competition with invasive species (Wilcove et al. 1998). AIS impact habitats they invade by altering ecosystem processes and reducing the abundance of native species through

predation, competition for food and space, hybridization, as well as the introduction of pathogens and parasites. Additionally, AIS adversely impact society by hindering economic development, preventing recreational activities, decreasing the aesthetic value of nature, and potentially serving as vectors of human disease. Management and control of AIS are crucial to ensure the ecological health of native aquatic ecosystems. Nationally, the economic damages caused by non-native species (terrestrial and aquatic) and related control efforts in the U.S. have been estimated at approximately \$120 billion (Pimentel et al. 2005) to more than \$140 billion annually (Cusack 2009). Many AIS (fish, invertebrates, and plants) have been identified throughout the basin. While some of these species are isolated to smaller geographic areas, Asian carps and Dreissenid mussels are examples of AIS that impact the entire basin. Successful prevention, management, and control of AIS in the Mississippi River Basin will require unprecedented coordination and collaboration among state and federal agencies.

Asian Carp

Introduced Asian carps (Bighead Carp, Black Carp, Grass Carp, and Silver Carp) have become established in many portions of the basin. These invasive fish were introduced into waters of the United States as the result of combinations of direct stockings by (or authorized by) various agencies, unauthorized stockings by private individuals, and unintentional escapes from university research facilities, federal and state agency facilities, and private aquaculture operations. The feeding habits and population densities of the Asian carps cause significant ecological harm where populations become established. The resulting diminished opportunity for fishing (recreational and commercial), boating, and other wildlife-associated recreation causes significant negative economic impact. To address these populations, the national *Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States* (Conover et al. 2007) was approved by the national Aquatic Nuisance Species Task Force in 2007 with an estimated 20 year implementation cost of approximately \$286 million.

Dreissenid Mussels

Zebra and Quagga mussels (collectively known as Dreissenid mussels) arrived in the North American Great Lakes in the 1980s. They have rapidly invaded many additional waterways due to their ability to disperse at all life states: adults routinely attach to boat hulls and other floating objects and are inadvertently transported by humans to new locations, juveniles are able to detach and drift for short distances, and larvae drift downstream in large numbers. Once introduced to a waterbody, the mussels reproduce rapidly, resulting in vast numbers of sharp-shelled adults that coat solid structures and substrates, and alter the ecosystem through filter-feeding. Dreissenid mussel invasions

cause substantial damage to native wildlife, recreational fishing and boating, drinking water supply systems, hydroelectric facilities, and agricultural production. Established mussel populations are expensive to control and virtually impossible to eradicate. To address these populations, a *Quagga-Zebra Mussel Action Plan for Western U.S. Waters* (Western Regional Panel 2010) was approved for implementation by the national Aquatic Nuisance Species Task Force in 2010 with an estimated annual cost of \$117 million.

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

- Coordinated delivery of basin-wide, state-based Asian 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.

Problem Area 2: Inadequate Resources for Research and Management of Shared Fisheries

Fishery resource management in the basin is complicated by the ability of fish to move among state jurisdictions. Furthermore, the states have different management considerations in terms of recreational and commercial fisheries, harvest reporting requirements, law enforcement, and habitat restoration. States are good at sharing what they are doing and the information

they have, but rarely have the resources to collaborate on research or reporting. States also vary on the amount of resources dedicated to river work, due to competing demands from other areas of the state.

Commercial fishing occurs to some extent on all basin waters. Targeted species range from invasive fishes such as Common Carp and Asian carps, to native fishes such as buffalo species, catfish species, and Paddlefish. However, few agencies dedicate staff or other resources to monitoring the take, compliance, and reporting of these species. The actions of commercial fishers in one state affect the fish, commercial fishing and angling in other jurisdictions. Understanding the scope and patterns of harvest throughout the basin requires dedicated resources.

Differing demands of various constituencies need to be managed. In some states, there is conflict between recreational anglers and commercial fishers for the various catfish species. However, little scientific evidence is available to demonstrate the effects of one fishery on another. This leads to management challenges that could be addressed with additional resources directed to the basin.

Even the management of species some states consider threatened or endangered is complicated by jurisdictional challenges. For example, Paddlefish management throughout the basin ranges from no harvest, to recreational fisheries, to commercial fisheries. Paddlefish make long-distance migrations (>2,400 km) throughout the basin moving between states, tributary systems, and management strategies, underscoring the need for interstate cooperation (Rosen et al. 1982; Henley et al. 2001; Grady et al. 2005; Pracheil et al. 2012; Stell et al. 2018; Tripp et al. 2019).

Interjurisdictional management of shared fisheries 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.

Problem Area 3: Habitat Loss and Degradation

The lands and waters of the basin have been altered dramatically to allow for agricultural production, waterways transportation, flood protection, and many other uses. While these alterations are the result of societal decisions, there are consequences and challenges that must be addressed. Much of the Mississippi River and its interjurisdictional tributary waters are listed as impaired under the Clean Water Act, Section 303(d) (EPA 2010; Figure 3). MICRA member agencies have developed a preliminary list of more than 1,000 demonstration projects to improve aquatic habitat throughout the Mississippi River Basin (MICRA unpublished report).

Interjurisdictional fisheries, both recreational and commercial, rely on habitat that is declining or has been lost completely. Reservoirs throughout the basin are afflicted by a diversity of fisheries management problems that are exacerbated by issues such as reservoir ageing, development in the watershed, watershed storage management, and invasive species (Miranda et al. 2020). Habitat improvements benefit fisheries and have positive impacts on additional river uses. All combined, a sustainable basin improves the overall resiliency of the system for continued use of its resources and benefits society values. While there are challenges to addressing declining habitat, it is possible to create a system that maintains support of multiple river uses and provides the flexibility needed to recover from floods and other natural disasters, in addition to impacts from land and water uses, and pollution.

Recovery and improvement of vital habitats can be accomplished by addressing key issues such as: land use, water use, water quality and quantity, and contaminants.

Land Use: Land use issues affecting interjurisdictional fisheries within the basin can be divided into two categories; watershed land use and floodplain land use.

Watershed Land Use: Runoff from watersheds greatly influences habitat availability and quality, especially impacts related to increased runoff, nutrient input, erosion, and sedimentation. While many watersheds have plans in place, there is limited coordination and consideration of interjurisdictional rivers as the receiving water when identifying priority watershed work.

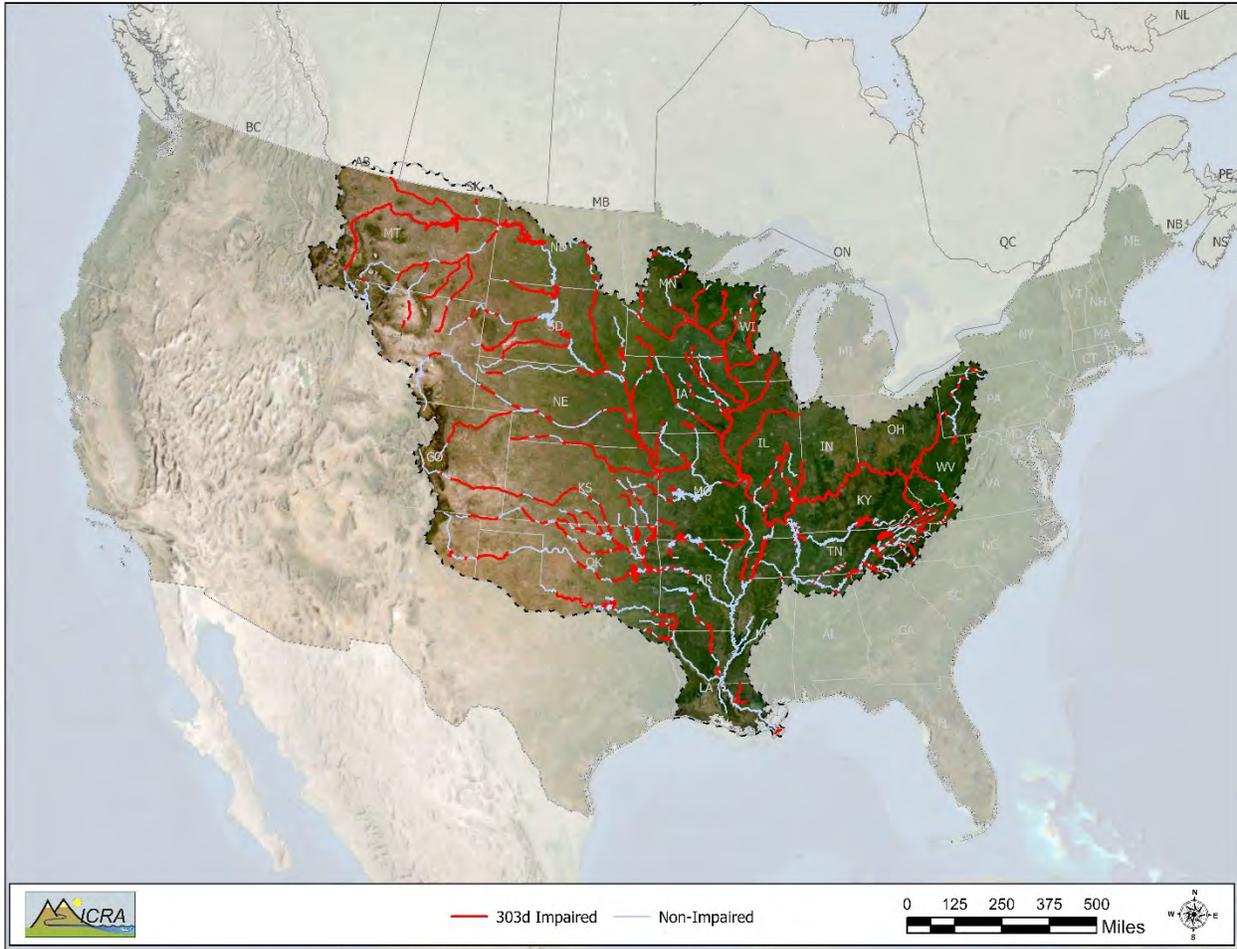


Figure 3. The Mississippi River and its interjurisdictional tributaries. Waters designated as impaired under the Clean Water Act, Section 303(d), are shaded red.

Floodplain Land Use: Fish habitat, and their access to critical life history needs, has declined within the interjurisdictional river floodplains due to a great variety of alterations to meet societal needs. Within floodplain actions are needed on all interjurisdictional rivers to restore depths, substrates for spawning, and access to floodplain wetlands and forests for spawning and feeding.

Water Use: Interjurisdictional rivers are used for a variety of purposes: drinking water, commercial navigation, recreation, waste disposal, fishing, and others. Inherent to this diverse array of uses is the potential for conflicting priorities among user groups. Infrastructure to meet societal needs for navigation and flood control directly impacts habitat by causing erosion, excessive water velocities, and sedimentation of side channels and other habitats. Dams on many of the rivers also directly impact the

migration of interjurisdictional fishes, resulting in lost spawning opportunities and suppressing population levels below reproductive potential.

Water Quality and Quantity: Water quality has long been recognized as a key factor in healthy and sustainable fishery populations and their habitat needs. Runoff from urban and agricultural areas can cause fish kills and induce fish stress in interjurisdictional waters, often many miles downstream of the source. Water quality that supports a healthy and resilient fishery also benefits the quality of drinking water, recreational opportunities, and urban community health. Water quantity is a lesser known issue affecting fisheries and habitats. Alterations to the hydrology of interjurisdictional rivers due to wetland loss, tile drainage, irrigation, watershed development, flood control, and hydropower have affected important hydrologic cues that trigger successful spawning events on some rivers. Many of these same alterations have affected groundwater recharge, which in turn can reduce base flow in rivers. Altered base flow can impact shallow habitats needed for fishery nursery habitat.

Contaminants: Interjurisdictional rivers in the basin have thousands of miles where fish consumption advisories have been issued regarding commercially or recreationally caught fish. Levels of metal and chemical contamination of fish flesh may not be directly due to contact with polluted waters. Bioaccumulation of these contaminants occurs as fish prey on smaller organisms, which in time builds on the levels of contaminants within the body of larger fish. Contaminants may be within sediments (e.g., PCBs or lead) or dissolved in water (e.g., wastewater).

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).

Problem Area 4: Limited Public and Stakeholder Involvement and Support

The Mississippi River and its tributaries comprise one of the largest and most valuable ecosystems in the world. Public use and awareness of river resources varies throughout the basin. Due to the vast infrastructure and publicity devoted to navigation, flood control, shipping, and business activity, many people view the basin purely in terms of economic importance. Many outdoor recreationists and those living near the Mississippi River have not fully recognized nor appreciated the value of the natural resources and recreational opportunities the basin provides. Society has largely neglected the health and sustainability of the natural resources of the basin.

Cultural differences, river access, and public perceptions regarding water quality and general safety of river related recreation all have a major impact on public use and awareness throughout the basin. It is difficult for people to recognize the value in organizing and working cooperatively when they do not realize they share common problems and opportunities. Realization of these common factors can lead to an increased appreciation of basin natural resources and empower stakeholders to view their actions as having an impact beyond themselves and their local community. Considering such helps people realize that by working in collaboration and in a coordinated manner they can have a positive impact on such a large ecosystem from which many stakeholders will benefit.

Many cities and towns along the basin's rivers are working to showcase the river as a major asset and provide a natural connection for their residents and tourists to the recreational opportunities that it provides. Mayors from 124 cities and towns along the main stem Mississippi River recognized their collective need to protect and restore the Mississippi River as a natural system that can support human culture and economies, as well as the river's unique ecosystem and wildlife (www.MRCTI.org). As a result, the Mississippi River Cities and Towns Initiative was formed in 2012 to revitalize the river, attract more river related recreation, and create more jobs to develop sustainable economies within their communities.

A lack of adequate resources in terms of funding, personnel, and staff time has constrained inter-agency coordination and interjurisdictional management of fishery resources in the basin. The long-term management of self-sustaining interjurisdictional fishery resources in the basin will require a commitment among state and federal agencies to collaboratively prioritize fishery management needs, develop shared management objectives, and coordinate implementation, data sharing, and evaluation of management actions. Inter-agency collaboration must focus beyond just the state and federal agencies. Increased public awareness and perceived value of the resource are crucial, as are increased stakeholder involvement and support, to the success of the agencies' collaborative management efforts. Effective stakeholder involvement provides

a method for identifying public concerns and values, developing consensus among affected parties, and producing efficient and effective solutions through an open, inclusive process.

Interjurisdictional management of shared fisheries 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.

Strategies for Mississippi River Basin Fishery Management

MICRA has been an effective partnership over the last 30+ years, providing for basin-wide coordination and communication among the fishery management agencies to address the most significant interjurisdictional fisheries management issues. Through the MICRA partnership, the agencies have made progress addressing multiple problems challenging interjurisdictional fishery management in the basin, yet coordination and communication have not been enough to resolve the most significant issues. The member agencies recognize the need to move beyond coordination and communication, to a cooperative approach for inter-agency planning, implementation, and evaluation of management actions to achieve collaboratively established management objectives for shared interjurisdictional fishery resources. The agencies have identified a set of broad strategies and strategic procedures to guide cooperative, inter-agency management. These fundamental strategies are ecosystem management, information management and sharing, outreach and communication, consensus, and accountability. Many

of the strategies and strategic procedures included in the GLFC's Joint Strategic Plan for the Great Lakes are directly applicable to the Mississippi River Basin and are included with permission in this plan.

Ecosystem Management Strategy

In adherence to an ecosystem-based management strategy, member agencies should respond to practices by agencies that could negatively impact aquatic ecosystems and their associated fisheries. Natural resource agencies should address the impacts of overlapping policies and activities to pursue a unified approach, across agency and state boundaries, to address the needs of interjurisdictional aquatic ecosystems and fisheries. The Commission and member agencies should engage in structured, multi-level communication with federal, state, and tribal environmental agencies in activities such as the production of sub-basin management plans, strategies, and reports for shared waters of the Mississippi River Basin.

Therefore: Member agencies shall exercise their expertise, authority, and influence to ensure that ecosystems and landscapes are managed to provide for the biological, chemical, and physical needs of aquatic communities and fisheries.

Information Management and Sharing Strategy

Information useful for management should be made readily available for application whenever appropriate. However, agencies involved in fisheries and environmental management in the Mississippi River Basin have generated a variety of data that, while useful, are often inadequate for measuring and predicting the basin-wide effects of their decisions. Typically, this information remains available only in the state which collected it as there is no inter-agency hosting site for the sharing of these data.

Member agencies would all benefit from basin-wide commonality in, and accessibility to, information collected and used to measure and predict the effects of decisions. It is important that fishery management agencies make necessary decisions as quickly as possible, and nothing in this strategy should be construed as suggesting that urgent decisions should be delayed until enough highly specific scientific information is available to ensure an airtight legal case.

Therefore: Member agencies will cooperatively develop means of measuring and predicting the effects of fishery - and environmental - management decisions and share relevant data to effectively achieve collaboratively developed management objectives.

Outreach and Communication Strategy

Outreach and communication should be carefully planned, purposefully developed, and effectively directed to both internal and external audiences. Communicating management actions, results, and emerging issues to lawmakers, the public, and other user groups is needed to increase awareness and support for the Commission's and member agencies' on-going and planned efforts to address aquatic resource and fisheries management priorities in the basin. A strategic communications plan should be developed to identify and address appropriate levels of communication to various internal and external audiences. Outreach and Communication should be considered on multiple levels:

Therefore: Member agencies will develop and implement a communication plan for strategically disseminating relevant information to internal and external target audiences.

Consensus Strategy

The Joint Strategic Plan represents the first formal commitment of the member agencies to a set of procedures intended to ensure that the actions of one fishery management agency would not jeopardize the interests of another member agency. The Joint Strategic Plan is not intended to usurp or weaken the legal responsibilities of the member agencies to manage their fisheries. The consensus strategy proposed here is intended to provide for a commitment to cooperative approaches to improve the collective efforts of the individual management agencies to achieve the proposed common goal statement and collaboratively developed management objectives, while recognizing the absolute need for member agencies to maintain individual flexibility, particularly at the operational level within the sub-basins. A more detailed explanation of consensus is provided in Appendix A.

A frequent obstacle to effective resolution of issues is a lack of cooperative agency action. Even when a clear common purpose is agreed upon, individual agencies are sometimes unable to perform effectively due to inadequate financial or political support. Clearly, the establishment of consensus among agencies would not only provide significant help in obtaining financial and political support for individual agency initiatives but would also provide member agencies with an incentive to act in accordance with the group's interest and intent.

Therefore: Consensus among member agencies must be achieved when management actions will significantly influence the interests of more than one jurisdiction.

Accountability Strategy

Positive participation in the consensus-management process will be encouraged by application of management-by-objectives at an inter-agency sub-basin and basin level. This implies, of course, open, and transparent public disclosure of each agency's programs and plans in terms of operational objectives, targets, and performance. Disclosure will not only provide for mutual evaluation of any management proposals that may affect another's interests but will make a major contribution to the development of integrated operational programming employing the best available fisheries science and technology.

Therefore: Member agencies must be openly transparent and accountable for their programs and performance.

Strategic Procedures

Strategic planning is the process of documenting and establishing a direction of work that needs to be completed by assessing both the current state and the future desired condition. Strategic procedures provide guidance and a basic system of governance for how member agencies will work together to implement and achieve long-term strategies and goals within the Mississippi River Basin.

Ecosystem Management

1. **Environmental Issues** – Sub-basin committees will identify issues that may impede the fulfillment of aquatic-community objectives. Sub-basin committees will identify appropriate methods to achieve, refine, and assess progress on environmental, aquatic community, and fisheries objectives.
2. **Management Coordination** – Sub-basin committees will develop joint proposals and plans for shared or common issues that focus on identifying environmental needs relative to their respective aquatic community and fisheries objectives. Coordination across sub-basin committees will occur when issues affect more than a single sub-basin.
3. **Environmental Issue Resolution** – Unresolved or emerging environmental issues may be referred by sub-basin committees to the member agencies or the Commission to represent their interests before the appropriate controlling authorities.
4. **Habitat Advisory** – Sub-basin committees will develop ecosystem objectives and identify critical habitats essential for achieving aquatic community and fisheries objectives. Assessment of watershed, floodplain, water quality and quantity, contamination, and

other aquatic habitat issues will be coordinated through the sub-basin committees to identify mutually beneficial solutions to sustain economically and ecologically beneficial results.

5. **Aquatic Invasive Species** – Member agencies will collectively identify, develop, and promote the implementation of procedures to prevent unauthorized and potentially detrimental introductions, prevent the spread, and control existing populations of aquatic invasive species.

Information Management and Sharing

6. **Data Standards** – To ensure compatibility among the member agencies, the Commission will coordinate the development and implementation of standards for collecting, recording, and maintaining fishery management and assessment data when deemed appropriate for projects coordinated under the auspices of the Commission.
7. **Models** – The Commission will support the development and use of fishery models by the sub-basin committees and member agencies to improve management of interjurisdictional fishery resources in the Mississippi River Basin.
8. **Information Access** – The Commission, its member agencies, and other entities are encouraged to maintain interjurisdictional fishery databases on the Internet in a way such that other partners have access to data, and the Commission will maintain a catalog and links to such databases.
9. **Data Sharing** – Member agencies, upon request, are encouraged to provide their data to other agencies, if the collecting agency has had reasonable time to verify and interpret them (such time should not normally exceed one year for assessment data and three years for research data), and to collectively develop shared information services through the Commission.

Outreach and Communication

10. **Communications Planning** – Member agencies will develop and regularly maintain a strategic communications plan for the Commission that clearly defines objectives, audiences, messages, tools and activities, resources, implementation, and evaluation. A communications framework that details the roles and responsibilities of the Commission and member agencies will be included in the communications plan.
11. **Communications Framework** - The Commission will coordinate and facilitate communication efforts, develop outreach materials, and manage communications infrastructure (e.g. Commission website) in support of the communications plan.

12. **Outreach** – The Commission and member agencies will actively support implementation of the communications plan at the sub-basin, basin, and National levels as outlined in the communications framework.

Consensus

13. **Fish Community Objectives** – The sub-basin committees will define objectives for the structure of each of the sub-basin fish communities and develop a means of measuring progress toward their achievement.
14. **Operational Plans** – Each member agency should identify its plans for achieving the fish community objectives identified by the sub-basin committees.
15. **Changes in Practice** – Each member agency should submit all substantive changes from existing practice to the appropriate sub-basin committee before implementation.
16. **Consensus on Changes** – Any agency proposal for change that other agencies believe will influence their interests may become the subject of negotiations within sub-basin committees until a consensus among affected agencies is achieved.
17. **Conflict Resolution** – If consensus cannot be achieved, a member agency may seek advice from within the sub-basin committee or request the Commission to arrange/facilitate a forum for information exchange, arrange third-party mediation with any resolution accepted only by a consensus of the affected member agencies, or provide a mutually acceptable third-party intermediary to make a nonbinding recommendation.

Accountability

18. **Decision Record** – Consensus decisions made by the Commission or its committees shall be made a matter of record and will be shared with member agencies after each meeting.
19. **Agency Reports** – Fishery agencies, separately or jointly, will make annual reports to the sub-basin committees of the progress made towards achieving their mutual committee objectives.
20. **Sub-basin Committee Reports** – Each sub-basin committee will prepare an annual progress report and make recommendations to both the agencies and the Commission. In addition, each sub-basin committee will convene, on a rotational basis once every six years, a special conference focused on the state of its sub-basin. The proceedings of this

conference will be a publishable report on progress towards achievement of fisheries objectives.

21. **Fishery Commission Report** – The Commission’s annual report to the member agencies and the public will include a summary of sub-basin committee reports and recommendations regarding fishery and environmental objectives, ongoing programs, and issues needing attention.

Plan Governance

On approval of this plan by the member agency Directors, the member agencies commit to basin-wide, inter-agency collaboration as outlined herein for the establishment of shared management objectives, and the collaborative planning, implementation, and evaluation of management actions for the successful long-term biological and economic sustainability of interjurisdictional fisheries in the basin. Following approval of this plan, member agencies will collaboratively establish governance and operational structures for the Commission. Each member agency will designate an agency administrator to serve on the Commission, which will operate by consensus as defined in the memorandum of acceptance (to be developed). Agency administrators will provide governance, oversight, and decision making for the Commission’s operational structure. The governance body, when writing its own terms of reference, will make every effort to:

- Ensure accountability among the parties for the implementation and periodic review of this plan;
- Guide and support the institutional arrangements created through this plan;
- Ensure timely and effective information exchange between law enforcement and fishery management;
- Develop strategies with environmental agencies to ensure that the environmental objectives of the sub-basin committees become operational;
- Provide for input by relevant federal agencies; existing multi-state compacts, committees, and partnerships within the basin; and other organizations, as appropriate.

The operational structure will be based on the six MICRA sub-basin management units: Upper Mississippi River, Lower Mississippi River, Missouri River, Ohio River, Tennessee-Cumberland Rivers, and Arkansas-Red-White Rivers. Within each sub-basin committee, member agencies will collaboratively develop sub-basin fishery management plans and track progress towards

achieving management objectives for interjurisdictional fishery resources. The operational structure will provide for coordination across sub-basin committees for issues that affect or concern more than a single sub-basin.

All parties must approve changes to this plan and new additions to the member agencies.

Conclusion

The MICRA partnership has proven to be a needed, desired, and effective forum for improved communication and coordination on interjurisdictional fisheries management issues within the Mississippi River Basin. However, the MICRA partnership has not been effective in achieving inter-agency collaboration in the establishment of shared management objectives, and in the collaborative planning, implementation, and evaluation of management actions for interjurisdictional fisheries in the basin. The complexity of issues impacting biological and economic sustainability of fishery resources in the basin, and the multiplicity of fisheries and aquatic management authorities, limit the effectiveness of individual fisheries management agencies, even multi-agency sub-basin collaborations. With more than three decades of coordination on interjurisdictional fisheries management in the basin through the MICRA partnership, the member agencies are confident the long-term biological and economic sustainability of fishery resources in the basin will be dependent upon the level of basin-wide collaboration provided for within this plan. To accomplish this level of cooperative, inter-agency management, formal state and federal agency commitments are necessary from each management authority in the basin to support implementation of this framework.

Implementation will require an increased dedication of resources and staff to the collaborative process outlined within this plan. Securing a long-term, stable funding source to support coordination, implementation, and evaluation of management actions and associated research will be paramount for success. We believe that the economic, ecologic, and social value of the basin's fishery resources, the multiplicity of management entities, the vital need for interstate collaboration, and the federal nexus with the management of interjurisdictional fishery resources and their aquatic habitats, warrant federal legislation to authorize and provide appropriations to support a Mississippi River Basin Fishery Commission.

Long-term sustainability of fishery resources in the basin will require three focus areas for the proposed Commission:

- cooperative fisheries management,
- research necessary to support fisheries management, and

- AIS control.

Effective fisheries management is dependent upon science-driven research to inform and evaluate management decisions. Since 2015, Congress has appropriated hundreds of millions of dollars to federal agencies to manage and control Asian carp species in the Mississippi River Basin and prevent their spread to the Great Lakes. The USFWS has been directed by Congress to lead multi-agency efforts to control Asian carps in the Mississippi River Basin and works closely with MICRA to identify priority project needs within the basin. USFWS provides financial assistance to states to support implementation of the national *Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States* (Conover et al. 2007). The proposed Commission would improve the efficiency and effectiveness of federal and state efforts to collaboratively implement the national Asian carp plan, a critical need for the long-term sustainability of native fishery resources throughout much of the basin. Similarly, the Commission could serve an important role coordinating state and federal agency actions to address other AIS impacting fishery resources throughout the basin.

This Joint Strategic Plan is a proposal for an agreement among the basin's fishery management agencies to establish a formal, on-going process for cooperatively establishing fishery management objectives and planning, implementing, and evaluating management actions for the long-term biological and financial sustainability of the basin's interjurisdictional fishery resources. Further, the plan provides broad strategies and strategic procedures as the framework for implementing the agreement.

This Joint Strategic Plan will be operationalized through the formation of sub-basin committees responsible for the development and implementation of sub-basin specific management plans. Member agencies are expected to use their representation on the individual sub-basin committees as a means of representing their own interests and negotiating consensus decisions regarding joint concerns. A coordinating body will be established to provide for basin-wide coordination among the sub-basin committees. Governance and decision making will be the responsibility of a governance body represented by fishery management agency administrators.

It will be important during the formation of the Commission to consider how it will engage and work with the existing multi-state compacts, committees, partnerships, and other organizations within the basin. The proposed Commission would share common goals with many of these entities and will benefit from recognizing the importance of working with these entities to achieve common goals.

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Appendix A

Definition and Concept of Consensus

As consensus is a fundamental strategy to this plan, it is imperative that all member agencies operate under a singular concept and definition of consensus.

The Merriam-Webster dictionary defines consensus in the following way:

1. General agreement; the judgement arrived at by most of those concerned
2. Group solidarity in sentiment and belief

The following definition of emergent consensus from the Great Lakes Fishery Commission's 'A Joint Strategic Plan for Management of Great Lakes Fisheries' has served the organization well for several decades and is particularly relevant to the implementation of this Joint Strategic Plan.

Emergent consensus results from the crystallization of opinion after all points of view have been heard in the marketplace of ideas. In theory, each individual weighs the evidence and then draws a rational conclusion. The accumulation of judgment constitutes public opinion. If the emergent majority is forceful enough, the minority adopts its view and the result is consensus.

Within the Commission, issues will be discussed by the member agencies until there is broad agreement on a decision or course of action. To reach lasting consensus decisions that are likely to prove robust (to changing values, circumstances, and politics) over time, a decision-making framework that deals effectively with science and values is necessary (Gregory et al. 2012)¹. Issues will be adequately discussed among members to identify and clarify reasons behind apparent differences in values and interpretations of factual information. It is critical that minority views are expressed, explored, and creative solutions given full consideration. In working to reach consensus, member agencies will deliberately work to clarify areas of agreement or disagreement with the goal of understanding and accurately characterizing key disagreements and areas of uncertainty.

The following is provided for further clarification of the concept of consensus as it relates to the Commission.

¹ Gregory, R., L. Failing, M. Harstone, G. Long, T. McDaniels, and D. Ohlson. 2012. Structured Decision Making: A Practical Guide to Environmental Management Choices. Blackwell Publishing Ltd. 299 pp.

1. Q. How do you know when consensus is achieved?

A. Consensus is achieved when all member agencies can endorse or accept the decision and there is an absence of opposition. A member agency may have a dissenting opinion without opposing a consensus decision.

2. Q. What happens if a consensus decision cannot be achieved?

A. Alternative decision-making pathways will be explored for issues on which consensus cannot be readily achieved. For example, a member agency may request the fishery commission to arrange/facilitate a forum for information exchange (e.g. structured decision making approach), arrange third-party mediation with any resolution accepted only by a consensus of the affected member agencies, or provide a mutually acceptable third-party intermediary to make a nonbinding recommendation.

3. Q. How do you ensure adherence to the consensus decisions?

A. You cannot; however, you can provide inducements to adherence by means such as having the consensus formalized through the signing of a public document by a chief executive officer.

Appendix B
Memorandum of Acceptance
of the
Joint Strategic Plan for Management of Mississippi River Basin Fisheries

THIS MEMORANDUM OF ACCEPTANCE made and entered into this 1st day of February 2021, by and between the states of Alabama, Arkansas, Colorado, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Montana, Nebraska, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Virginia, West Virginia, Wisconsin, and Wyoming, hereinafter "States", through or along which the Mississippi River and its interjurisdictional tributaries flow.

RECITALS:

WHEREAS, the parties hereto have long desired to adopt a Joint Strategic Plan for Management of Mississippi River Basin Fisheries, and

WHEREAS, the Mississippi Interstate Cooperative Resource Association prepared such a Joint Strategic Plan for Management of Mississippi River Basin Fisheries after years of efforts, deliberations, and consultations, and

WHEREAS, the parties hereto have had the opportunity to develop, review, and change the drafts of the Joint Strategic Plan for Management of Mississippi River Basin Fisheries, and

WHEREAS, the parties hereto have agreed that the Joint Strategic Plan for Management of Mississippi River Basin Fisheries, dated February 2021, represents the final product of the best efforts of the parties and serves the best interests of the parties hereto and the peoples of their states.

NOW THEREFORE, in consideration of the mutual benefits to be derived herefrom, the parties hereby covenant and agree as follows:

1. The Joint Strategic Plan for Management of Mississippi River Basin Fisheries, dated February 2021, is hereby accepted and adopted by each and every party signatory to this Memorandum of Acceptance.

2. The parties hereto pledge their support to the Goals set forth in the Joint Strategic Plan for Management of Mississippi River Basin Fisheries and commit themselves to resolving the Mississippi River Basin Fishery Issues raised in the Plan by adopting the Strategies for Mississippi River Basin Fisheries Management set forth in the Plan.

3. The parties hereto agree to develop a governance structure, institutional arrangements, and responsibilities for implementation of the Joint Strategic Plan for Management of Mississippi River Basin Fisheries and agree that changes to, or modifications of, the Joint Strategic Plan shall be accomplished

by consensus, utilizing procedures similar to those used in developing and adopting the Joint Strategic Plan.

4. The parties hereto agree to adopt and execute the Strategic Procedures set forth in the Joint Strategic Plan for Management of Mississippi River Basin Fisheries and commit themselves and their agencies and instrumentalities to carrying out these procedures to the extent practicable within fiduciary and personnel constraints.

5. Nothing in this Memorandum of Acceptance shall be construed as infringing on the sovereignty of any state signatory to this document, but shall rather be construed as a commitment of the sovereign power of such states to carrying out the Joint Strategic Plan hereby adopted.

IN WITNESS WHEREOF, the States have hereunto executed this Memorandum of Acceptance, as of the date first written.

ALABAMA DEPARTMENT OF CONSERVATION & NATURAL RESOURCES

Director

Date

ARKANSAS GAME AND FISH COMMISSION

Director

Date

COLORADO PARKS AND WILDLIFE

Director

Date

GEORGIA DEPARTMENT OF NATURAL RESOURCES

Director

Date

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Director

Date

INDIANA DEPARTMENT OF NATURAL RESOURCES

Director

Date

IOWA DEPARTMENT OF NATURAL RESOURCES

Director

Date

KANSAS DEPARTMENT OF WILDLIFE & PARKS

Director

Date

KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES

Director

Date

LOUISIANA DEPARTMENT OF WILDLIFE & FISH

Director

Date

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

Director

Date

MISSISSIPPI DEPARTMENT OF WILDLIFE, FISHERIES, AND PARKS

Director

Date

MISSOURI DEPARTMENT OF CONSERVATION

Director

Date

MONTANA DEPARTMENT OF FISH, WILDLIFE & PARKS

Director

Date

NEBRASKA GAME & PARKS COMMISSION

Director

Date

NEW YORK DEPT. OF ENVIRONMENTAL CONSERVATION

Director

Date

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

Director

Date

NORTH DAKOTA STATE GAME & FISH DEPARTMENT

Director

Date

OHIO DEPARTMENT OF NATURAL RESOURCES

Director

Date

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

Director

Date

PENNSYLVANIA FISH AND BOAT COMMISSION

Director

Date

SOUTH DAKOTA GAME, FISH & PARKS DEPARTMENT

Director

Date

TENNESSEE WILDLIFE RESOURCES AGENCY

Director

Date

TEXAS PARKS & WILDLIFE DEPARTMENT

Director

Date

VIRGINIA DEPARTMENT OF GAME & INLAND FISHERIES

Director

Date

WEST VIRGINIA DEPARTMENT OF NATURAL RESOURCES

Director

Date

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Director

Date

WYOMING GAME & FISH DEPARTMENT

Director

Date