

# HATCHIE-LOOSA HATCHIE MISSISSIPPI RIVER ECOSYSTEM RESTORATION STUDY, MILE 775-736, TN AND AR

General Scoping Meeting

Memphis District

19 October 2021



US Army Corps  
of Engineers®



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# AGENDA

**Welcome & Introductions**

**Purpose of the General Scoping Meeting**

**Overview**

**Non-Federal Sponsor  
History and Authority  
Schedule**

**Study Area  
Existing Conditions  
Conceptual Ecological Model**

**Planning Process**

**Problems and Opportunities  
Goals and Objectives**

**Constraints  
Initial Measures**

**Comments/Questions**



# PURPOSE OF THE MEETING

## **Inform the Public**

- **Provide overview and background on study**

## **Solicit input**

- **Issues and Concerns**
- **Development of alternatives**

**The USACE encourages full public participation to promote open communication on the issues surrounding the study.**



# NON-FEDERAL SPONSOR

## Lower Mississippi River Conservation Committee (LMRCC):

- A coalition of 12 state natural resource, conservation, and environmental quality agencies in Arkansas, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee.
- Since 1994, LMRCC has provided a regional forum dedicated to conserving the natural resources of the Mississippi's floodplain, focusing on habitat restoration, long-term conservation planning and nature-based economic development.
- LMRCC works in cooperation with numerous federal, state and non-governmental organizations for continual improvements to the Lower Mississippi River, recognizing its value as a multi-purpose river.
- <https://www.lmrcc.org/>





# NON-FEDERAL SPONSOR

## The LMRCC Member Agencies include:

- AR Department of Environmental Quality
- AR Game and Fish Commission
- KY Department for Environmental Protection
- KY Department of Fish and Wildlife Resources
- LA Department of Environmental Quality
- LA Department of Wildlife and Fisheries
- MS Department of Environmental Quality
- MS Department of Wildlife, Fisheries, and Parks
- MO Department of Conservation
- MO Department of Natural Resources
- TN Department of Environment and Conservation
- TN Wildlife Resources Agency

## Additional Stakeholders:

- Gulf Hypoxia Task Force, LMR Sub-basin Committee
- City of Memphis
- Meeman Shelby Forest State Park, TN
- Eagle Lake State WMA, TN
- National Audubon Society-Audubon Delta
- The Nature Conservancy
- 25 Federally recognized Tribes
- 2 State Historic Preservation Officers (TN and AR)
- USFWS
- USGS, MS Cooperative Fish and Wildlife Research Unit, MSU
- EPA
- ERDC



# PROJECT HISTORY

- 2000:** LMRCC publishes Aquatic Resources Management Plan (USACE was one of the many partners)
- 2000:** Congress authorizes Lower Mississippi River Resource Assessment (LMRRA) WRDA 2000 SEC. 402.
- 2001 to 2004:** LMRCC holds public meetings to identify specific projects.  
Developed 239 projects - Restoring America's Greatest River (RAGR) Plan - finalized in 2015
- 2007:** USACE received funding for LMRRA Reconnaissance Study.
- 2010:** LMRRA Recon study approved 5 March 2010.
- 2012:** Signed Cost Share agreement with The Nature Conservancy 11 Jan 2012 (75% federal / 25% non-federal) to conduct the LMRRA Study.
- 2016:** Delivered Final LMRRA Report to Congress July 2016.  
Recommended a variety of actions to improve habitat, recreation and information management on the Lower Mississippi River.  
Recommendations: Restore aquatic (e.g., side channels, oxbow, main channel, islands, sandbars) and terrestrial (e.g., wetlands, BLH, floodplain) habitats for native species through dike notching, etc.





# LMRRA RECOMMENDATIONS

Data Science and Communications Program				
Recommendation		Lead Organization	Cost	Value
DISC 1	Science Technology Information Center	USGS	\$2 million/year	Promote interagency cooperation, encourage research, foster public interest, and support other recommendations.
DISC 2	Sediment Study	USACE	\$4 million/year	Support management plans, better manage dredging and coastal restoration.
DISC 3	Water Quality Monitoring Program	USGS & EPA	\$2 million/ year	Provide clean water for people, industry, and habitat.
DISC 4	Tributary Watershed Studies	USACE	9 @ \$1-\$5 million each	Develop plans to manage tributaries for habitat, water quality, sediment, water supply, navigation and recreation.
DISC 5	Ecological Inventory	USACE & USFWS	\$1.7 million	Provide information to support restoration.
Habitat Restoration and Management Program				
Recommendation		Lead Organization	Cost	Value
HRMP 1	Conservation Reach Studies	USACE	8 @ \$3 million each	Restore aquatic (side channel, oxbow, main channel, islands, and sandbars) and terrestrial (wetlands, bottomland hardwoods, and floodplain) habitats for native species and especially federally listed species
HRMP 2	Aquatic Habitat Restoration Studies	USACE & USFWS	125 @ \$200,000 to \$ 15 million (maximum)	Restore individual sites for native species.
HRMP 3	Terrestrial Habitat Program	USDA & LMRJV	\$18,000,000	Restore floodplain habitat.
HRMP 4	Invasive Species Program	MICRA & ANSTF	Part of larger effort	Promote and protect native species.
Recreation Program				
Recommendation		Lead Organization	Cost	Value
RP 1	Boat Ramps	LMRCC and others	\$50,000 - \$750,000 each	Increase safety and meet recreation demand.
RP 2	Bicycle Trails	NGOs	variable	Increase safety and meet recreation demand.
RP 3	Riverfront Parks	Local Communities	variable	Promote community cohesiveness and meet demand.
RP 4	Riverboat Landings	Local Communities	variable	Provide safe, accessible opportunities and support local economic development.
RP 5	Marketing	NPS, MRPC, NGOs	\$2 million	Promote river use and encourage economic development.
RP 6	Lodging and Dining	Private Enterprise	variable	Meet demand and support economic development.
RP 7	Outfitters and Guides	Private Enterprise	variable	Increase safety, meet demand and support economic development.



# PROJECT HISTORY (cont.)

## Conservation Reach Studies

**Recommendation HRMP 1.** Conduct eight conservation reach habitat restoration studies on the LMR. The Mississippi River ecosystem is a dynamic system with interactions among the terrestrial and aquatic systems, main channel and side channel areas, mudflats, backwaters, tributaries, and islands. These feasibility studies would examine the Mississippi River and batture to determine if there is Federal interest sufficient to justify construction of ecosystem restoration features.

Eight reaches were identified as priorities:

Wolf Island to Island 8 Reach RM 946 – 910 (36 mi.)

**Hatchie/Loosahatchie Reach RM 775 – 736 (39 mi) (TN/AR)**

Islands 62/63 Reach RM 650 - 618 (32 mi.)

Arkansas River Reach RM 599 – 556 (43 mi.)

Possum (Worthington-Pittman) Reach RM 524 – 490 (34 mi.)

Palmyra River Reach RM 431 – 398 (33 mi.)

Lake Mary Reach RM 360 -322 (38 mi.)

Raccourci Cutoff Reach RM 300 -265 (35 mi.)

These reaches were chosen because they may provide valuable habitat for rare species; they each contain a channel crossing; the batture is wide in the reach; and there is a concentration of previously identified potential projects. Several of the reaches coincide with those the USACE Interior Least Tern Working Group identified as priorities. ERDC and USFWS personnel participated in the selection of the reaches.

Lead Organization and Partners: USACE needs specific authorization for this priority reach habitat program. Each reach study is planned to be conducted separately and would require non-Federal sponsors and cooperation with other Federal agencies like the USFWS and USDA. The studies should also consider restoration of upland habitats within the batture that are outside of the USACE ecosystem restoration mission. LMRCC's Restoring America's Greatest River (RAGR) initiative has already identified 104 potential projects that fall within these reaches.

Needs Addressed: This recommendation directly addresses needs for restoration of Side Channels, Backwaters and Oxbows, Sandbars and Gravel Bars, Main Channel Habitat, Vegetative Mosaic, Floodplain and Island habitats. It will also be useful in addressing needs for Water Quality, Sediment, Data Storage and Availability, Invasive Species, Boat Ramps and Safety.

Value: Each reach has opportunities to enhance a broad spectrum of features, i.e., restorable side channels, backwaters, and oxbows, a wide floodplain, large islands, populations of threatened and endangered species, and sandbars. These eight reaches total 290 miles or nearly 30% of the LMR. These studies would consider recreation features along with ecosystem restoration.





# PROJECT HISTORY (cont.) AND AUTHORIZATION

- 2017:** LMRCC et al. submitted proposal through WRDA 7001 process to get a study authority for the Conservation Reach studies recommended in LMRRA.
- 2018:** WRDA 2018 SEC. 1202. *ADDITIONAL STUDIES. (a) LOWER MISSISSIPPI RIVER; MISSOURI, KENTUCKY, TENNESSEE, ARKANSAS, MISSISSIPPI, AND LOUISIANA.— (1) IN GENERAL.—The Secretary is authorized to carry out studies to determine the feasibility of habitat restoration for each of the eight reaches identified as priorities in the report prepared by the Secretary pursuant to section 402 of the Water Resources Development Act of 2000, titled “Lower Mississippi River Resource Assessment; Final Assessment In Response to Section 402 of WRDA 2000” and dated July 2015. (2) CONSULTATION.—The Secretary shall consult with the Lower Mississippi River Conservation Committee during each feasibility study carried out under paragraph (1).*
- 2019:** LMRCC submits Letter of Intent to Sponsor the Hatchie/Loosahatchie Feasibility Study beginning in the FY 2021 Budget.
- 2021:** Received Funding to begin the HATCHIE/LOOSAHATCHIE, MISSISSIPPI RIVER MILE 775–736 HABITAT RESTORATION, TN & AR Feasibility Study.



# SCHEDULE

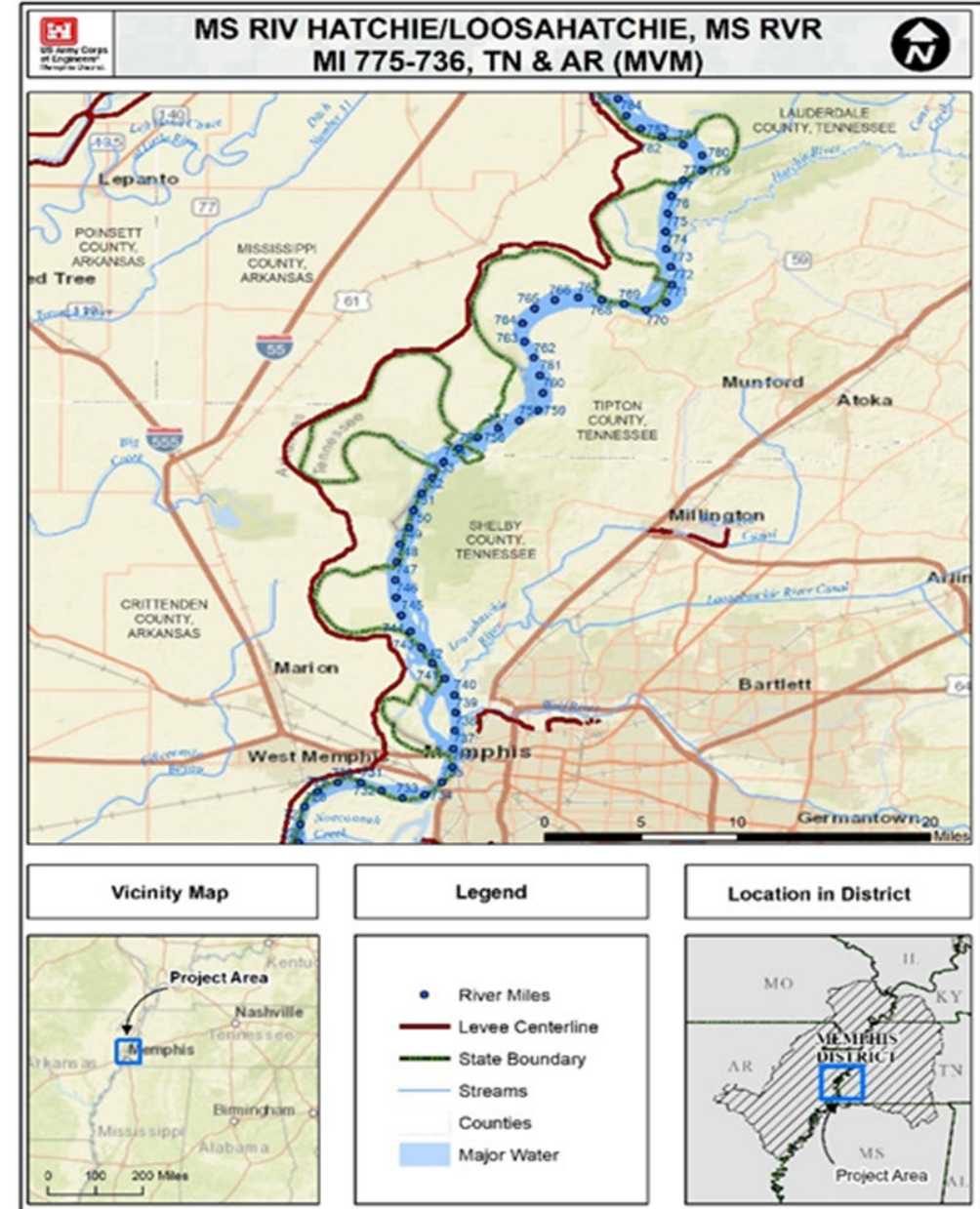
Milestone	Baseline	Status
Execute FCSA	30 July 2021	Complete
Alternatives Milestone	4 <sup>th</sup> Q 2021	-
TSP Milestone	3 <sup>rd</sup> Q 2022	-
Release of Draft Feasibility Report for Public Review	3 <sup>rd</sup> Q 2022	-
Agency Decision Milestone	1 <sup>st</sup> Q 2023	-
District Submit Final Feasibility Report to MVD	1 <sup>st</sup> Q 2024	
Division Engineer's Transmittal Letter	2 <sup>nd</sup> Q 2024	-
Chief's Report Milestone	3 <sup>rd</sup> Q 2024	-





# STUDY AREA

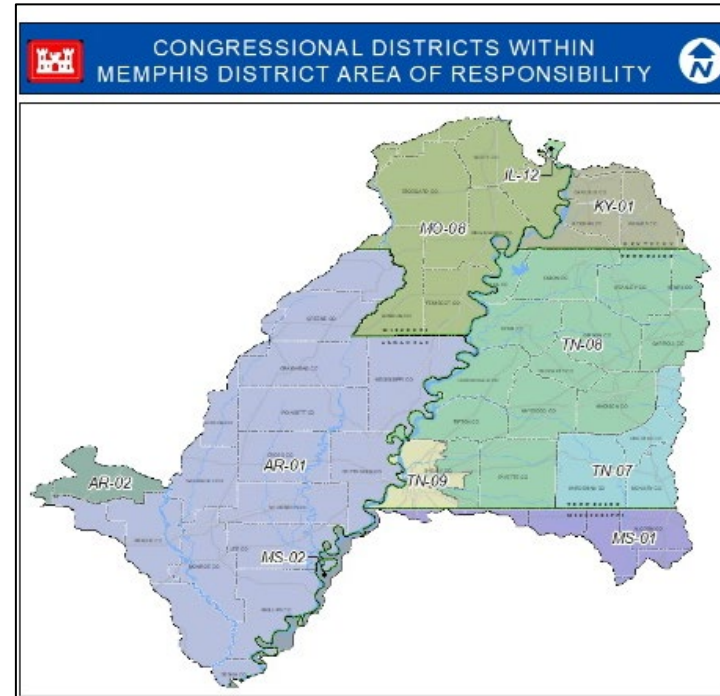
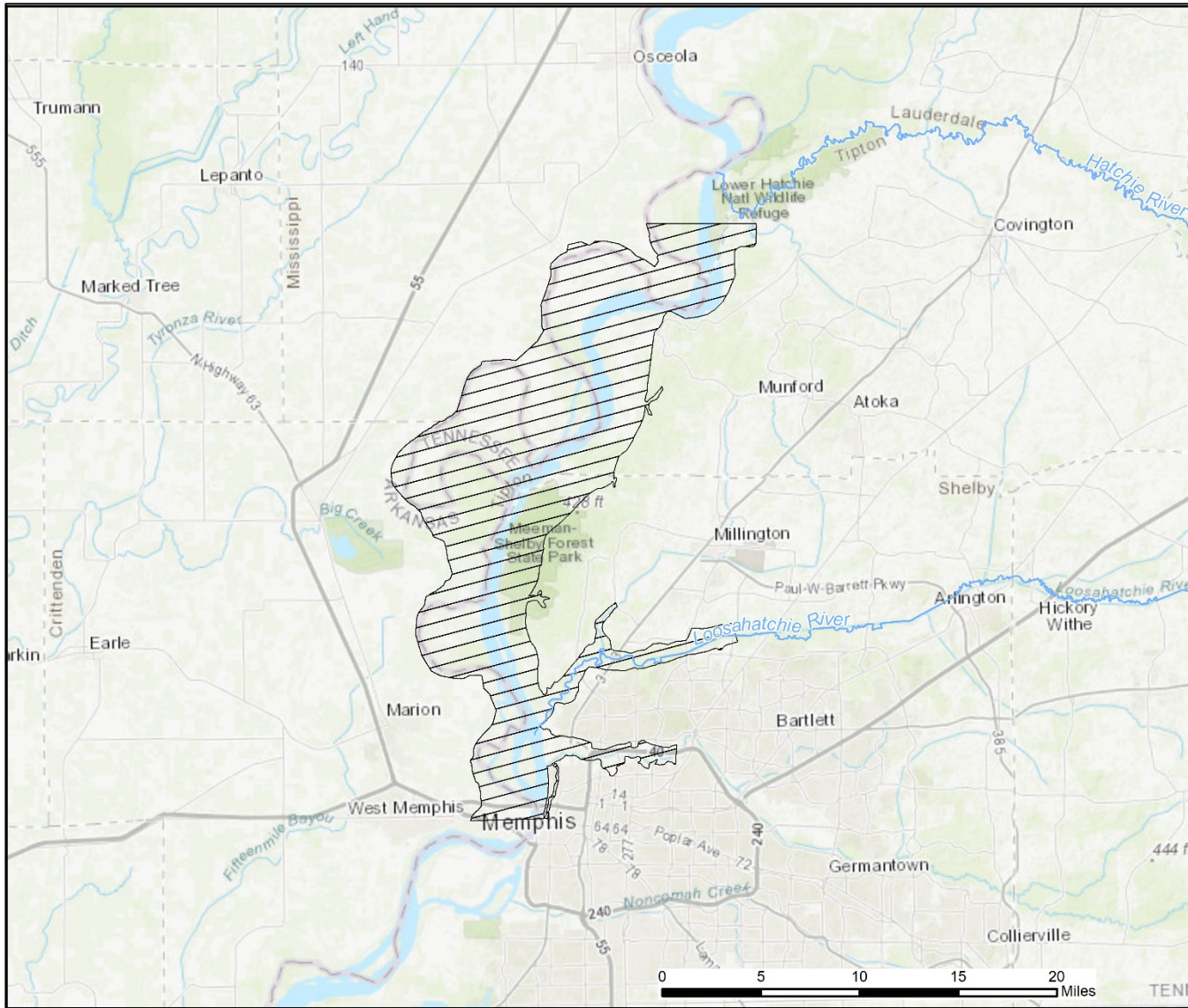
- 39-mile reach (RM 775-736)
- Beginning at the mouth of the Hatchie River and extending south to the mouth of the Wolf River Harbor.
- Reach includes
  - crossings,
  - pools,
  - side channels,
  - bendways, and
  - overbank areas between west levee and east bluff (2-9 miles).
- Three tributary mouths in the reach (Hatchie, Loosahatchie, and Wolf Rivers).
- Meeman Shelby Forest State Park, Eagle State State WMA, and Lower Hatchie NWR within this reach.







# STUDY AREA

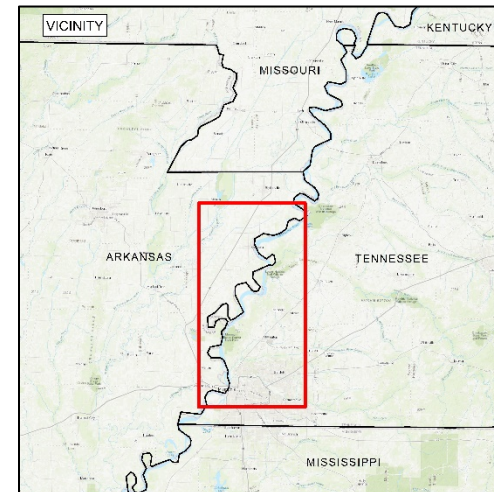


## Tennessee

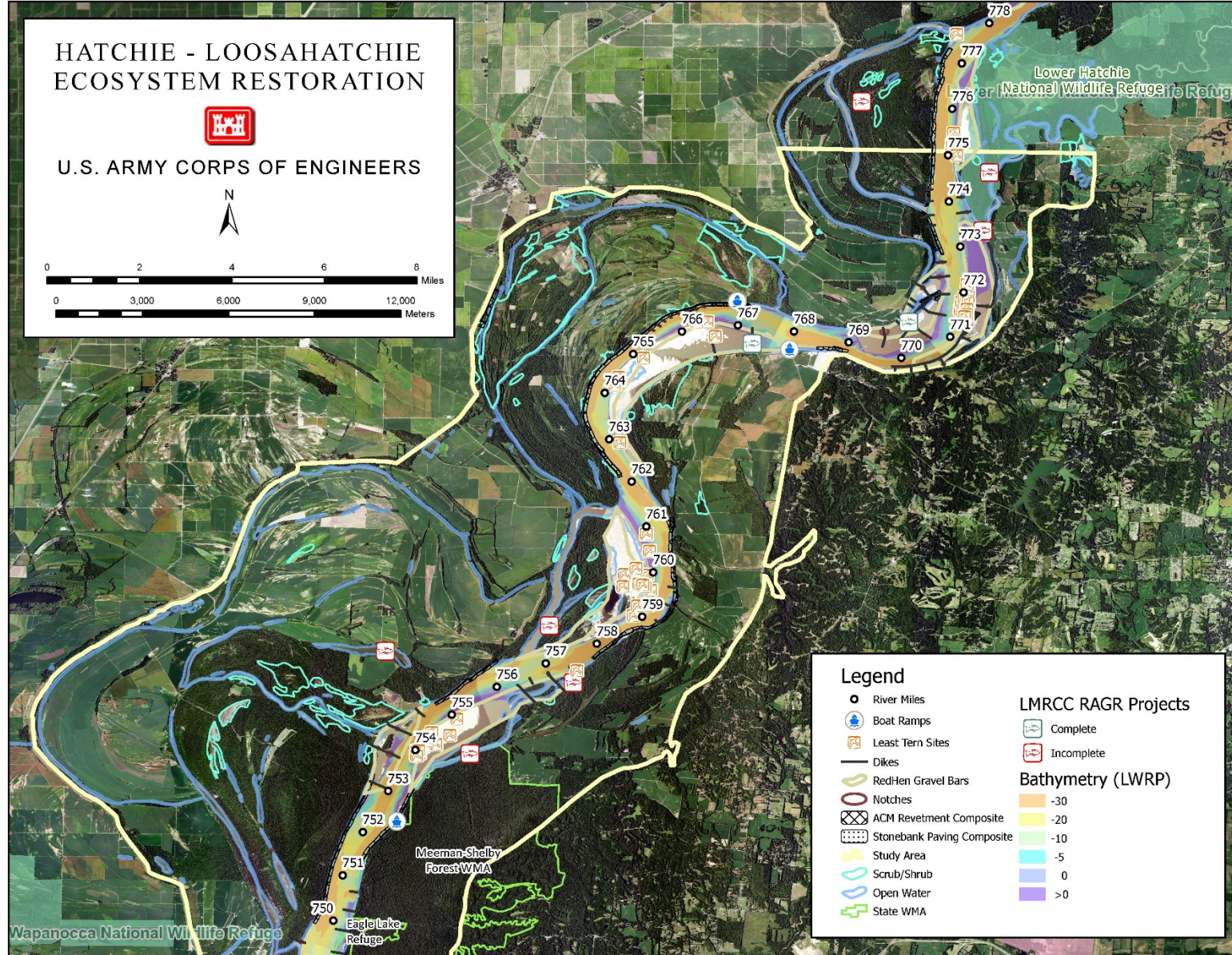
GOV. Bill Lee (R)  
SEN Marsha Blackburn (R)  
SEN Bill Hagerty (R)  
REP David Kustoff (R TN-8)  
REP Steve Cohen (D TN-9)

## Arkansas

GOV Asa Hutchinson (R)  
SEN Tom Cotton (R)  
SEN John Boozman (R)  
REP Eric "Rick" Crawford (R AR-1)



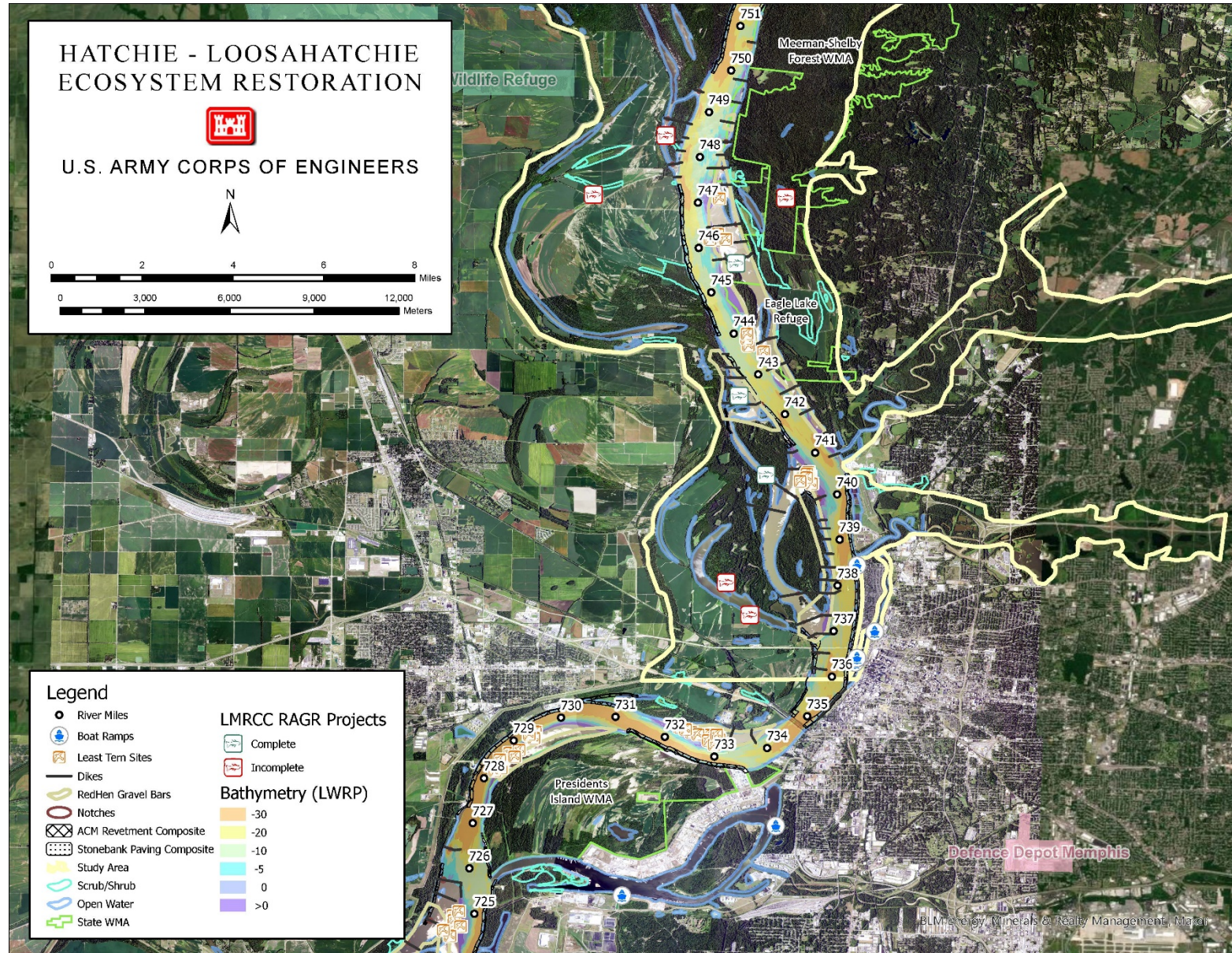








# STUDY AREA (cont.)





# EXISTING CONDITIONS

2019 Land Cover - NLCD	Area (acres)	Percent Composition
Agricultural land (Cultivated crops, Hay/Pasture)	53,693	38.8%
BLH (woody wetlands, Mixed Forest, Deciduous Forest)	53,250	38.4%
Open Water	26,557	19.2%
Developed (Open Space, low intensity, Med. Intensity, High Intensity)	2,829	2.0%
Early Successional (Emergent Herbaceous Wetlands, Herbaceous, Scrub/Shrub)	1,879	1.4%
Other (Barren Land, Evergreen Forest)	337	0.2%
<b>Total</b>	<b>138,545</b>	<b>100%</b>

Dominant land-use is agriculture and BLH followed by open water.

Approximately 3,150ac are enrolled in NRCS Easements.

Public lands (25,243ac) include:

- Meeman Shelby Forest State Park (12,539ac)
- Lower Hatchie NWR (9,451ac)
- Eagle Lake Refuge (3,253ac)

Vast amount of study area is privately owned lands.

Recreation is highly valued in the area for hunting, fishing, and canoeing/kayaking.

MS River floodplain is 80% smaller than it was historically due to the MS River Levee system.

Flood risk management and navigation projects have removed approximately 152 miles of bends and diverted flow from secondary channels.

Forest conversion due to lack of historic hydrology in floodplains.

Lack of aquatic and terrestrial diversity.



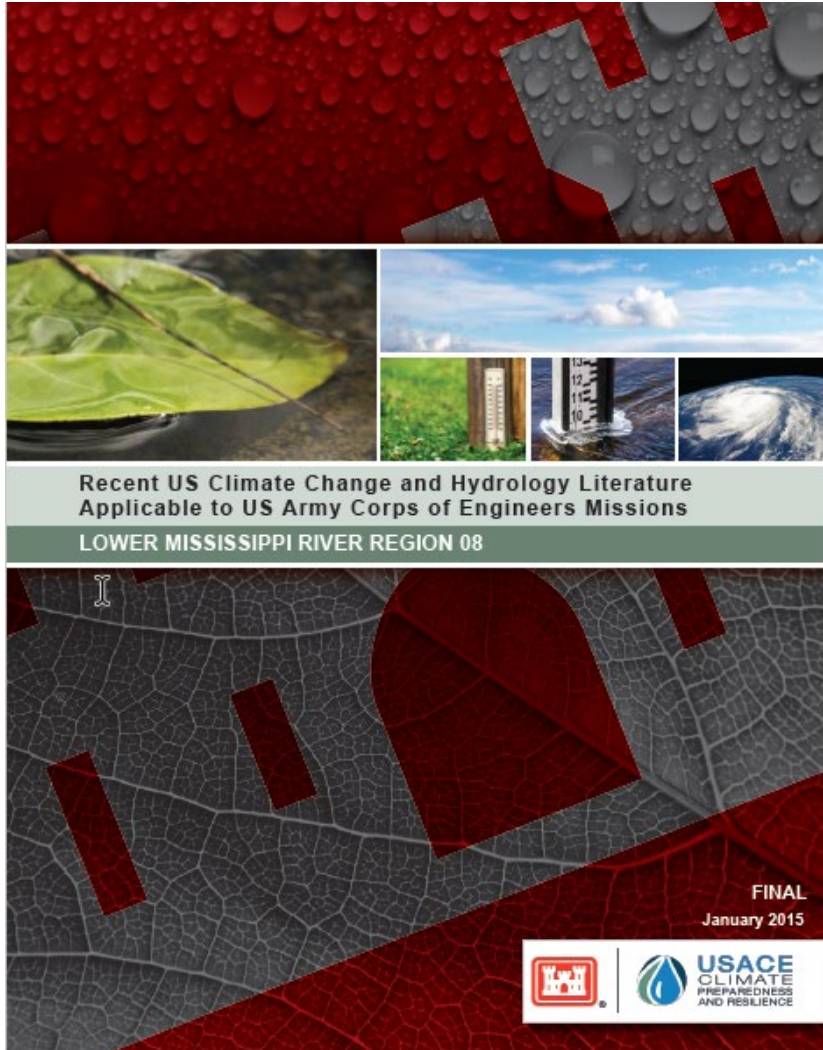


# FUTURE WITHOUT PROJECT

- No significant changes in the dominant land uses have occurred during the past 20 years and none are anticipated.
- Recreation is expected to remain highly valued in the area.
- No anticipated changes to flood risk management features or navigation operation are expected. Mainline levee is established.
- River maintenance and channel improvement will continue.
- Existing trends in floodplain habitats will continue.
- Aquatic and terrestrial diversity is expected to continue to decline.



# FUTURE WITHOUT PROJECT



“...Increased air temperatures and increased frequencies of drought, particularly in the fall and summer months, will result in increased water temperatures...water quality concerns...dissolved oxygen levels...

Increased annual rainfall variability... lead to variation in flows... particularly true during dry years, when water demands...outweigh water supply... During wet years, flooding may raise particular ecological concerns and may threaten ecosystems.”

PRIMARY VARIABLE	OBSERVED		PROJECTED	
	Trend	Literature Consensus (n)	Trend	Literature Consensus (n)
Temperature	—	(4)	↑	(8)
Temperature MINIMUMS	↓	(1)	↑	(4)
Temperature MAXIMUMS	—	(1)	↑	(5)
Precipitation	↑	(6)	↑	(5)
Precipitation EXTREMES	↑	(5)	↑	(4)
Hydrology/ Streamflow	↑	(5)	↓	(5)

## TREND SCALE

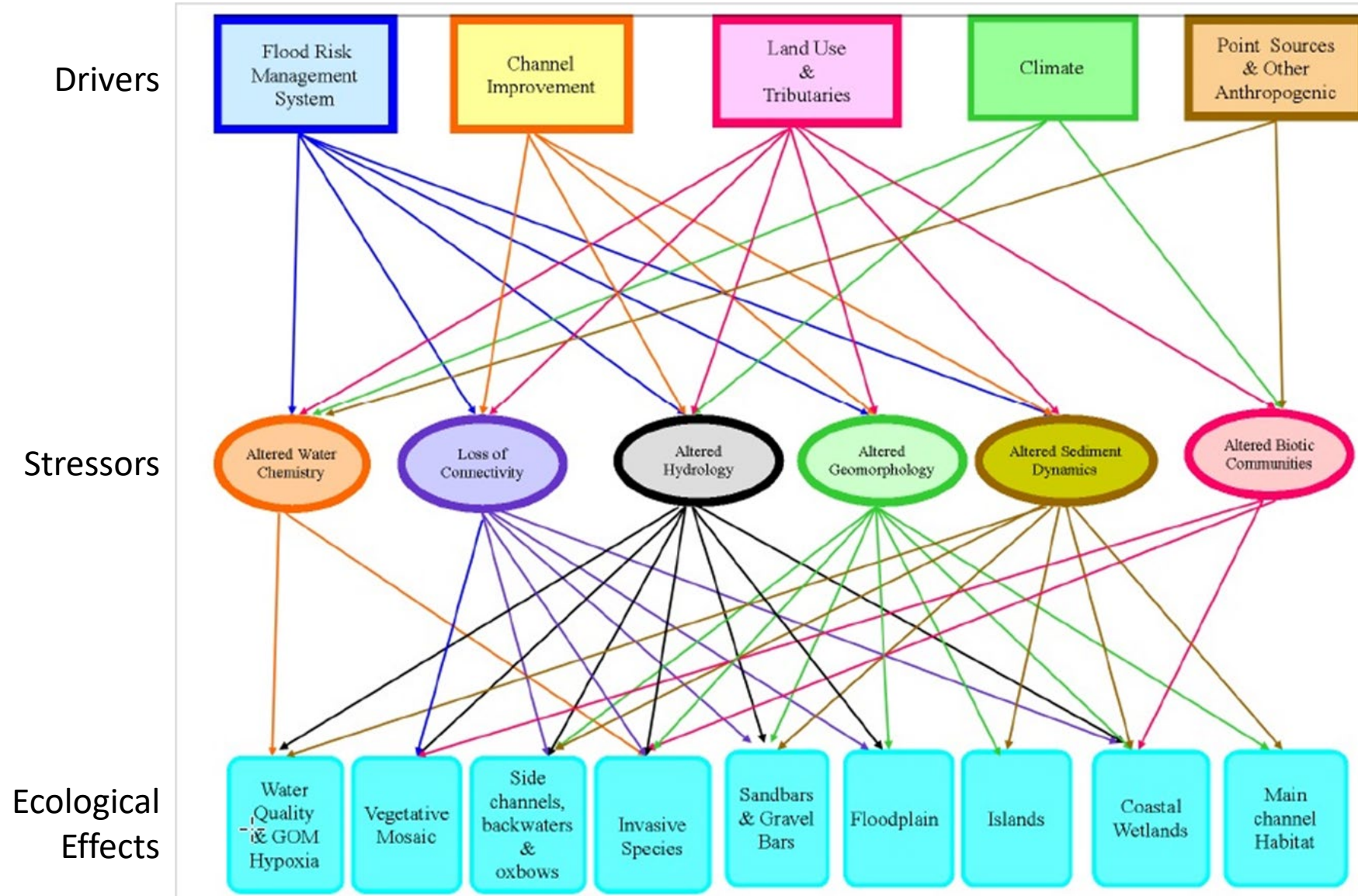
↑↑ = Large Increase    ↑ = Small Increase    — = No Change  
↓↓ = Large Decrease    ↓ = Small Decrease    ∅ = No Literature

## LITERATURE CONSENSUS SCALE

= All literature report similar trend    = Low consensus  
 = Majority report similar trends    ∅ = No peer-reviewed literature available for review  
(n) = number of relevant literature studies reviewed



# CONCEPTUAL MODEL

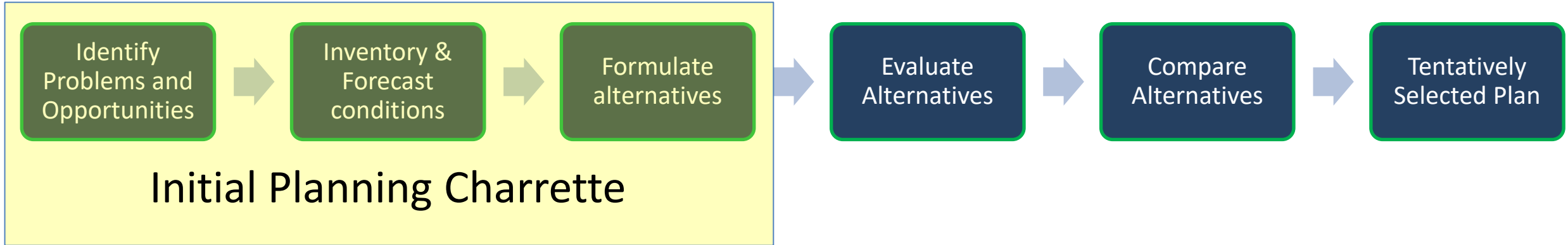


(Source: LMRRA - Assessment of Natural Resources Needs (2015))





# PLANNING PROCESS – INITIAL ITERATION



- Define the problem to be addressed,
- Conceptual definition of the scale of the project,
- Preliminary inventory and forecast of future conditions with available data and information,
- Identification of key areas of uncertainty that will impact the study and the project formulation,
- Initial identification of the decision criteria that will be used to formulate, compare and select alternatives.
- Initial formulation of alternative plans based on critical thinking and professional expertise.
- A draft decision management plan that identifies the level of detail and methods the team will apply to move to the next decision point.



# PROBLEMS AND OPPORTUNITIES



PROBLEMS	OPPORTUNITIES
Reduced vegetative diversity and forested habitats.	<ol style="list-style-type: none"><li>1. Increase BLH habitat.</li><li>2. Increase wetland habitat.</li><li>3. Propagate rivercane in higher elevations.</li><li>4. Increase riverfront forest habitat and main channel border habitat diversity.</li></ol>
Invasive species threaten native species and native habitats.	<ol style="list-style-type: none"><li>1. Promote native species restoration in areas where invasive species have become common. (e.g., Short Nose Gar/ Alligator Gar).</li><li>2. Reduce invasive and/or exotic species (e.g., carp, zebra mussel, marsh day flower).</li><li>3. Provide more spawning areas for native species (e.g., connecting side channels and backwater habitat in tributaries to connect habitat).</li><li>4. Increase habitat for native species, including federally listed species such as pallid sturgeon, fat pocketbook mussel.</li></ol>
Degraded gravel bars and sandbars.	Restore or protect established gravel bars and sandbars for native and threatened and endangered species (e.g., improve spawning habitat for pallid sturgeon and other fish species, fat pocketbook mussel, and interior least tern).



# PROBLEMS AND OPPORTUNITIES



PROBLEMS	OPPORTUNITIES
Reduced floodplain and aquatic habitat quality.	Restore the quality of floodplain and aquatic habitat within the batture to increase functionality of MS River Flyway, connect WRP lands with other features, reduce flood risk to surrounding areas, etc.
Degraded MS River island habitats.	Restore or protect established islands and point bars within the MS River to provide habitat (e.g., edge habitat) for sensitive species and their life cycle events (e.g., nesting).
Lack of connection of MS river to backwater, side channel, and floodplain waterbody areas.	<ol style="list-style-type: none"><li>1. Reconnect backwaters, side channels, and floodplain waterbodies with the main channel at normal water levels (e.g., fix or improve notches and dikes).</li><li>2. Improve water quality for threatened and endangered and native species.</li><li>3. Decrease nutrient load which contributes to Gulf of Mexico hypoxia.</li><li>4. Reduce water in some areas to return to more natural conditions and species composition.</li><li>5. Restore natural flooding regimes.</li><li>6. Increase connectivity to promote fish passage connections.</li></ol>
Lack of stop over and nesting habitat for migratory birds.	Improve MS Flyway by increasing habitat diversity to support avian species (e.g., increase stop over and nesting habitat for migratory birds).



# PROBLEMS AND OPPORTUNITIES



PROBLEMS	OPPORTUNITIES
Lack of recreational opportunities and access to public spaces in study area.	Increase outdoor recreational opportunities such as boating, fishing, hunting, bird watching, hiking, photography, etc. in the study area.
Head cutting in tributaries (e.g., in lower sections of study area).	Increase fish and other aquatic species habitat.
Loss of habitat connectivity.	Increase travel corridors for wildlife.
Increased sedimentation.	Reduce sedimentation/remove sediment plugs to return flooding to more natural conditions and therefore reduce forest transition that is currently occurring.
Lack of woody debris.	Add wood traps in secondary channels.



# GOALS AND OBJECTIVES

**GOAL:** To restore ecological structure and function along the Mississippi River including side channels and other aquatic habitat; floodplain forests; and several scarce vegetative communities such as wetlands, canebrakes, riverfront forests, and BLH forests.

**OBJECTIVE 1:** Increase quantity and/or quality of vegetated habitats and maintain a diverse **vegetative mosaic** in the floodplain to benefit native fish and wildlife resources (e.g., migratory birds and species of conservation concern) focusing on habitat such as: emergent, floating, and submersed aquatic vegetation; rivercane; BLH.

**OBJECTIVE 2:** Improve quantity and/or quality of diverse **large river habitats** (sandbars, gravel bars, side channels, etc.) to support critical life history requirements of priority species.

**OBJECTIVE 3:** Increase aquatic connectivity with the Mississippi River to improve quality of chutes, sloughs, backwater, oxbows, borrow pits, tributary mouths, and other **floodplain waterbodies** to support critical life history requirements of priority aquatic species.

**OBJECTIVE 4:** Improve **recreational** opportunities and access to public spaces in study area.





# CONSTRAINTS

## CONSTRAINTS

Avoid impacts to established flood risk reduction and navigation features, such as the MR&T features.

Avoid/minimize impacts to navigation operations on the Mississippi River.

Avoid impacts to existing gravel bars.

Avoid activities that lead to increased invasive species.

Avoid impacts to existing infrastructure.

Avoid/minimize/compensate impacts to threatened and endangered species.

Avoid/minimize/compensate impacts to cultural resources.

Minimize adverse impacts to environmental resources.



# MEASURES

**OBJECTIVE 1: Increase quality and/or quantity of vegetated habitats and maintain a diverse **vegetative mosaic** in the floodplain to benefit native fish and wildlife resources (e.g., migratory birds and species of conservation concern) focusing on habitat such as: emergent, floating, and submersed aquatic vegetation; rivercane; BLH.**

Decrease inundation in existing BLH where community compositions are shifting from oak species to more water tolerant species optimizing hydrology to promote historic native species

Conversion of agricultural land to natural habitats through purchasing and/or easements (high priority areas include: protect/convert higher elevation areas to BLH to act as wildlife corridors and refuges during high water events (e.g., access to Wappanocca NWR, Brandywine Island, etc.)).

Create canopy gaps in dense canopy forests.

Establish tree screens/riparian buffers in areas where there is less than 300-ft width along the main channel.

Protect existing rivercane stands at those higher elevation stands (such as, natural levees and high elevation banks surrounding waterbodies near Brandywine Island).

Propagate/Establish rivercane at higher elevation locations within the floodplain (potential locations include: high elevations surrounding floodplain waterbodies and vegetating potential spoil piles from plug removals).

Priority species: Indiana Bat, NLEB, Little Brown Bat, Prothonotary Warbler, Rusty Blackbird, - (BLH); King rail - (herbaceous wetlands), Swainson's Warbler - (rivercane), waterfowl, etc.



# MEASURES

**OBJECTIVE 2: Improve quantity and/or quality of diverse large river habitats (sandbars, gravel bars, secondary channels, islands with side channels, etc.) to support critical life history requirements of priority species.**

Install structures to increase velocity and uncover gravel bars buried in sand to benefit macroinvertebrates and potential pallid sturgeon spawning areas.

Install dike notches to protect and/or improve sandbars for nesting interior least terns.

Install woody debris traps to promote aquatic macroinvertebrate colonization and forage locations for riverine fish.

Install hardpoints as bank stabilization measure in ecologically sensitive areas (e.g., potentially couple with LWD traps in side-channels, protect island tips like at RM 754L where various sturgeon species have been documented).

Rehabilitate notched dikes or remove sediment plugs by dredging or excavation to connect secondary channels for sufficient time to allow various aquatic macroinvertebrate communities to complete their life cycles.

Priority species: Pallid Sturgeon, blue sucker, Lake Sturgeon, Sicklefin Chub, Stonecat, American eel (secondary channels, gravel bars, point bars); interior least tern (sandbars)



# MEASURES

**OBJECTIVE 3: Increase aquatic connectivity** with the Mississippi River to improve quality of chutes, sloughs, backwater, oxbows, borrow pits, tributary mouths, and other **floodplain waterbodies** to support critical life history requirements of priority aquatic species.

Examine tie-channels of oxbow lakes and other floodplain waterbodies to minimize head-cutting (e.g., grade control structures) and maintain periodic connectivity with river (e.g., dredging or removal of sediment).

Remove downstream barriers (e.g., increase connectivity of tie-in channels) and install weirs or control structures on upstream ends of waterbodies allowing Alligator gar access to warm water in spring for spawning.

Optimize floodplain connections at Eagle Lake Refuge to increase habitat quality.

Examine tributary mouths for head-cutting and install grade control structures.

Priority species: Alligator gar, paddlefish, Alligator snapping turtles (floodplain waterbodies, floodplain spawning habitat, etc.)



# MEASURES

## OBJECTIVE 4: Improve recreational opportunities and access to public spaces in study area.

Provide opportunities for canoe/kayak access (e.g., primitive boat launch and create/support blue-way trails).

Install smaller dike notches on either side of a large notch to allow fisherman areas to anchor and access fishing opportunities.

Provide education and access to the LMR Ecosystem through signage, interpretive guidance and other approved cost shared facilities listed in EP 1165-2-502 (e.g., support the proposed City of Memphis Freshwater Institute).

Install more paved ramps along the Mississippi River to increase access



# FORMULATION STRATEGIES

## Alternatives:

- No Action
- Alternatives aligned with geographic complexes
  - Brandywine complex
  - Eagle Lake complex
  - Loosahatchie Bar complex
  - combination
- Alternatives that are species specific
  - aquatic species (obligate riverine species, floodplain spawning species)
  - terrestrial species (migratory birds, species of conservation concern, rivercane)
  - combinations







# RECAP – INPUT WE NEED FROM YOU

- Do the problems identified capture the degraded ecological functions?
- Are there additional problems or opportunities that are not captured?
- Are there additional constraints the planning team should consider?
- Are there additional measures that would address the problems?
- Are there specific locations or unique opportunities for consideration?
- Are there specific data, modeling, or reports that should be considered?



# QUESTIONS

Website: <https://www.mvm.usace.army.mil/Missions/Environmental-Stewardship/Hatchie-Loosahatchie-Mississippi-River-Ecosystem-Restoration-Study/>

Written comments:

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or

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167 North Main St., RM B-202  
Memphis, TN 38103-1894