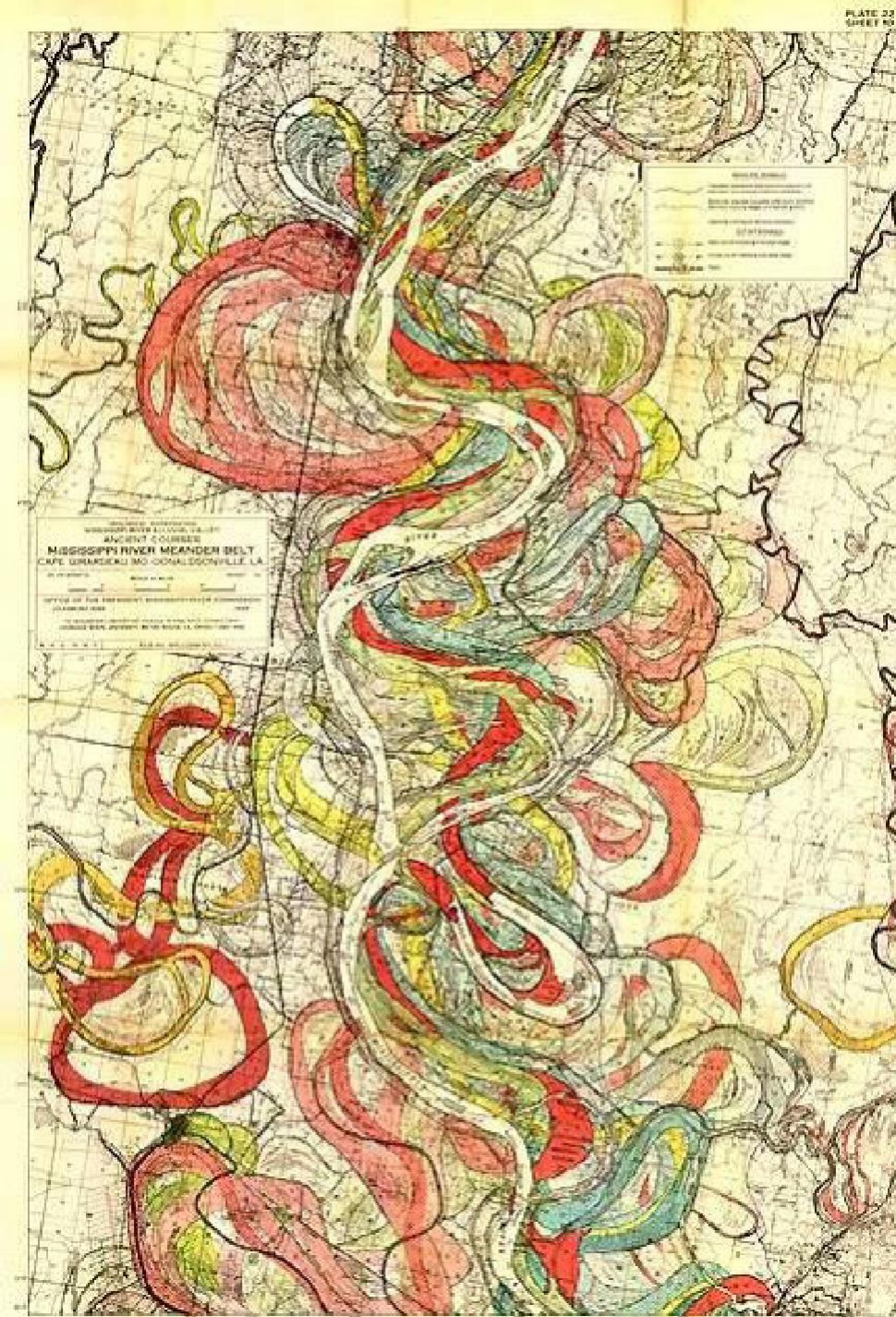


Lower Mississippi River Conservation Committee (LMRCC)

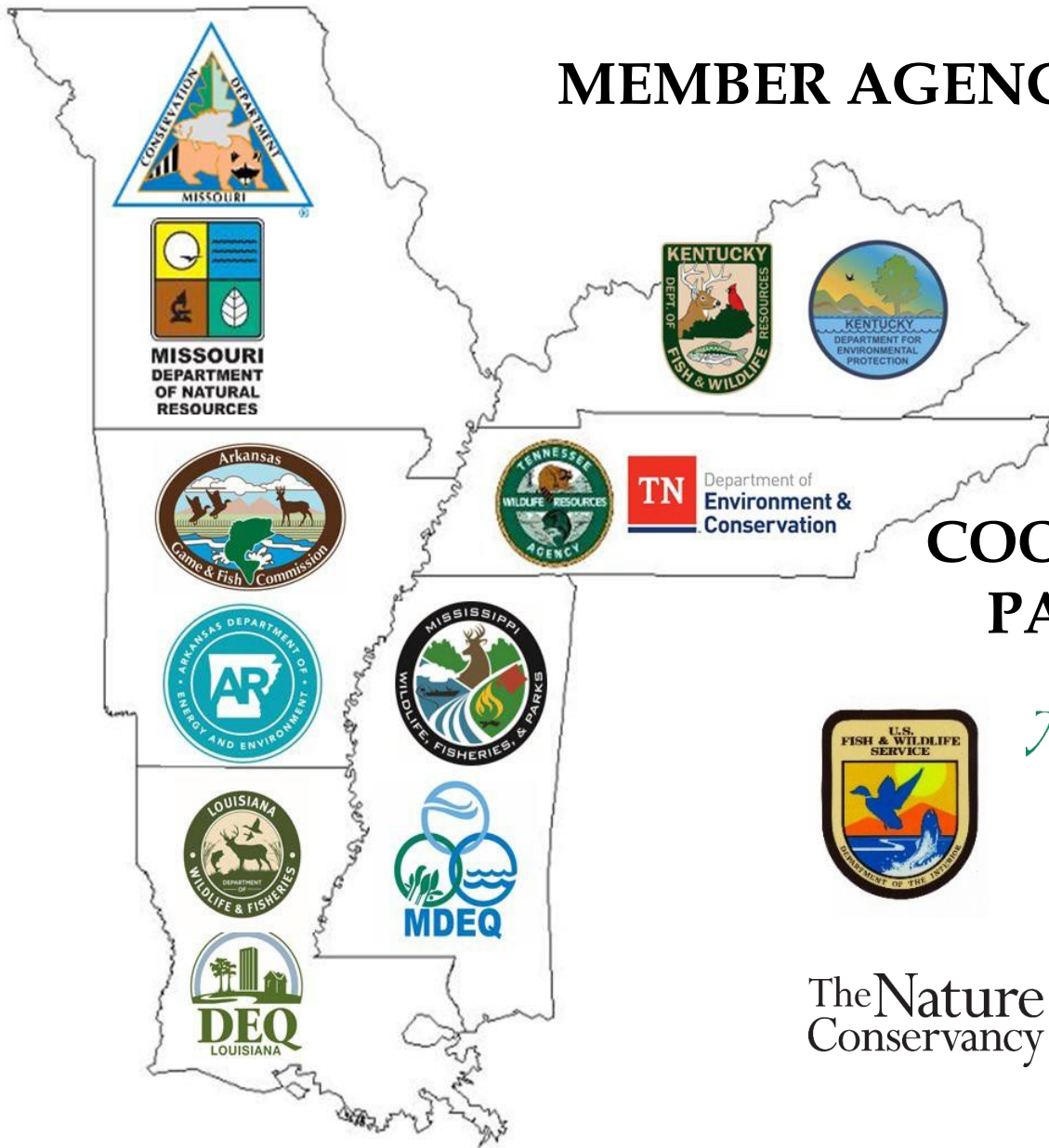
Mississippi River Science Forum
February 15, 2023

Angeline Rodgers
Coordinator, Lower Mississippi River
Conservation Committee

Project Leader, USFWS Lower Mississippi River
Fish & Wildlife Conservation Office



MEMBER AGENCIES



COOPERATING PARTNERS



- Established in 1994
- 6 States, 12 Agencies
- Incorporated as 501c3



- Information Exchange
- Conservation Planning
- Habitat Restoration



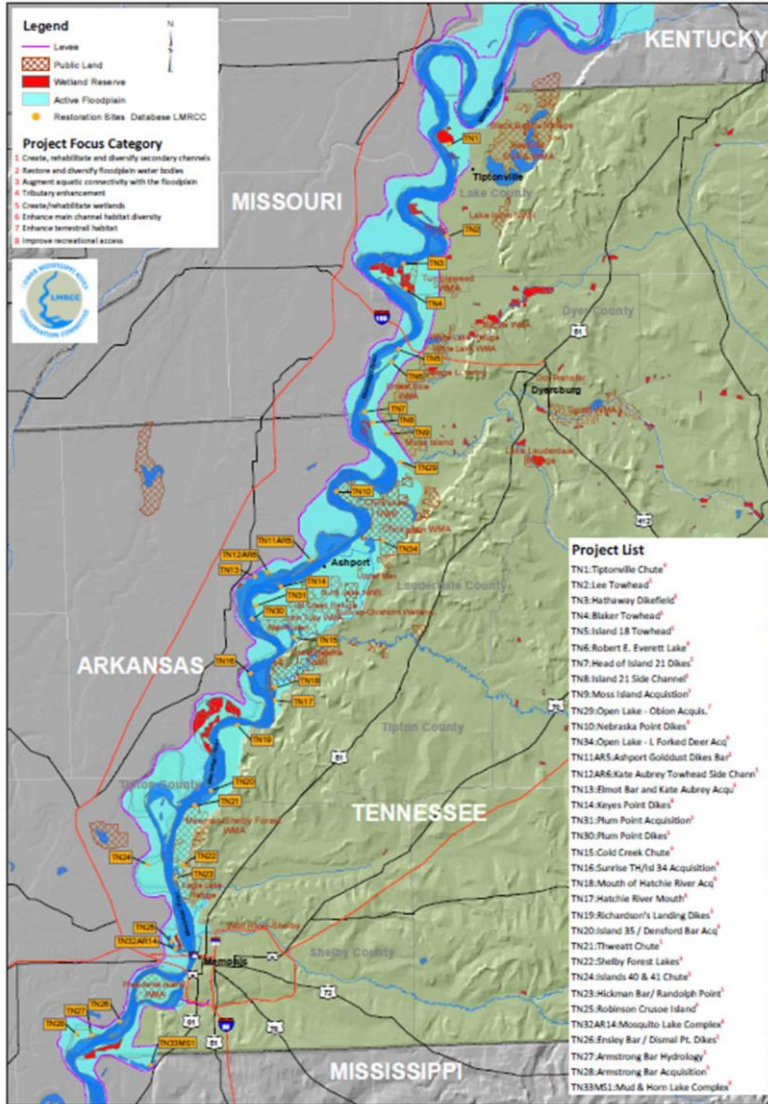
Interdisciplinary Communication and Coordination

RESTORING AMERICA'S GREATEST RIVER A HABITAT RESTORATION PLAN FOR THE LOWER MISSISSIPPI RIVER

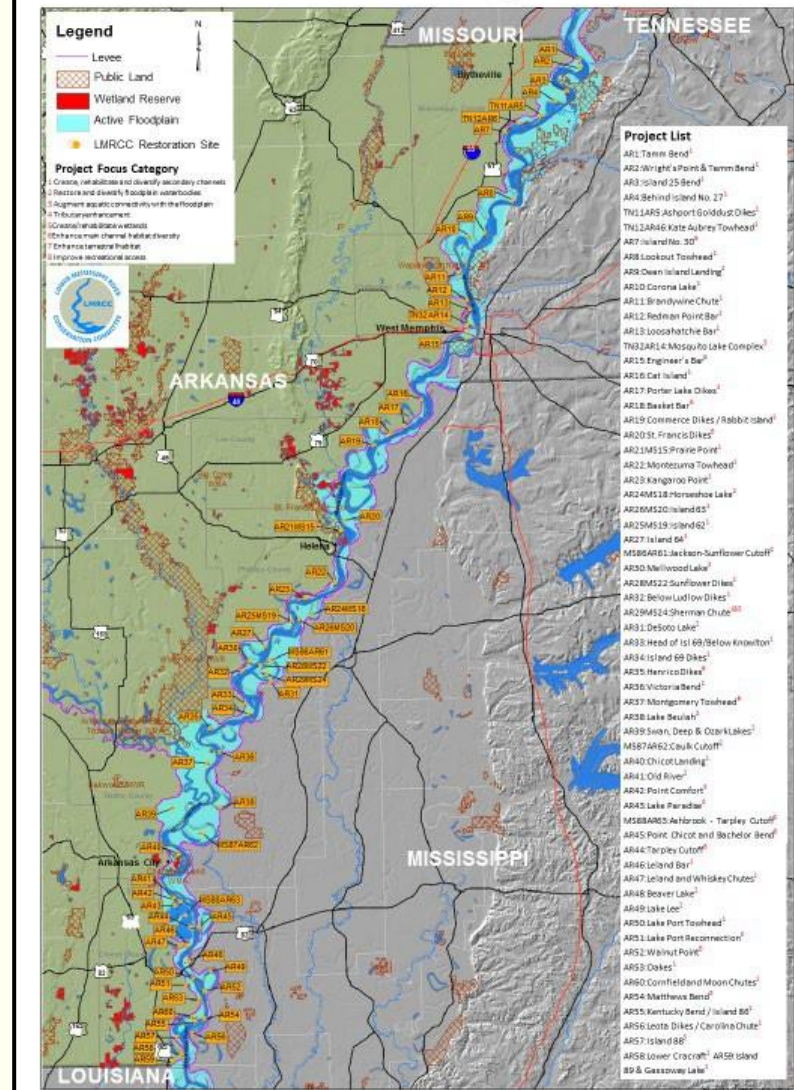


LOWER MISSISSIPPI RIVER CONSERVATION COMMITTEE

Tennessee Habitat Projects in Active Floodplain of the Lower Mississippi River



Arkansas Habitat Projects in Active Floodplain of the Lower Mississippi River

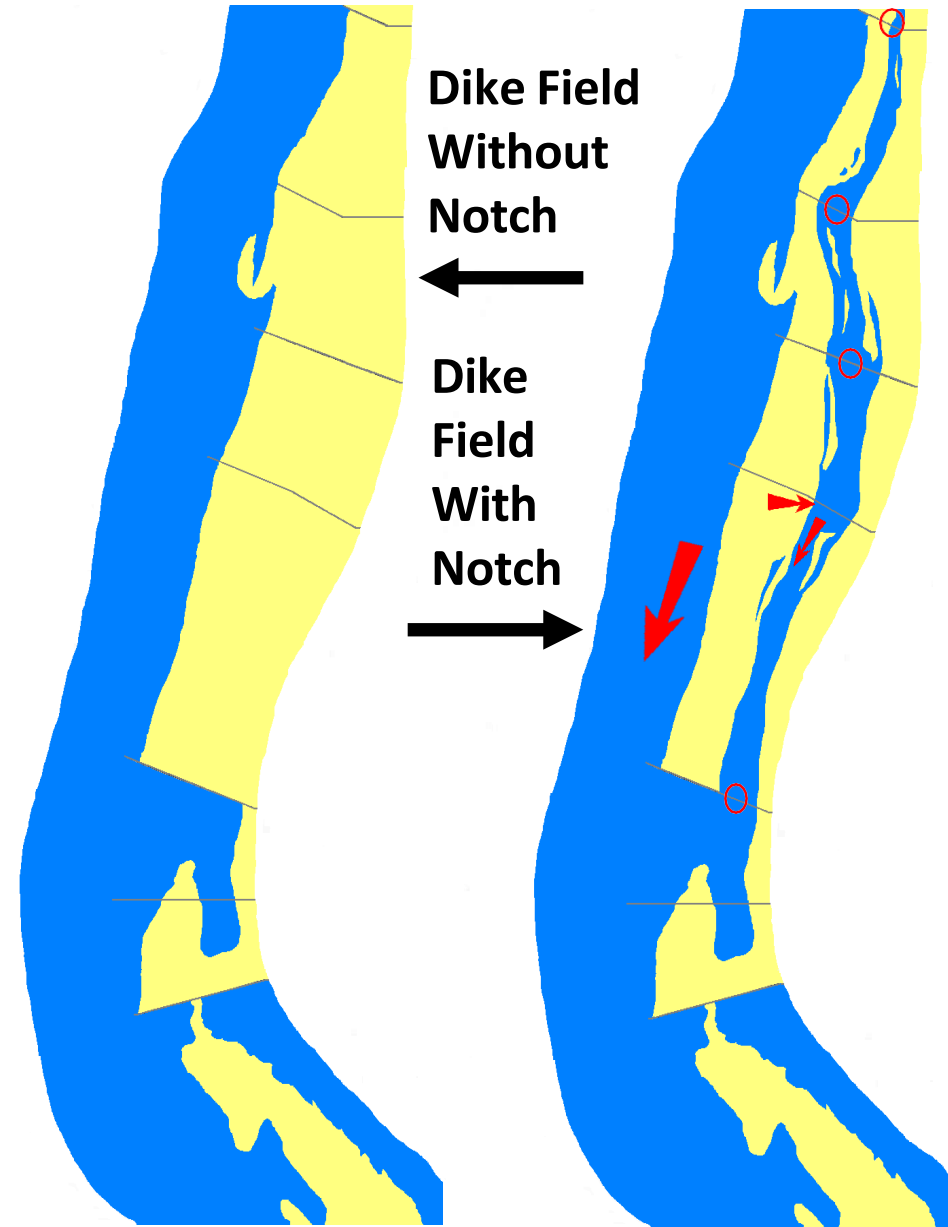
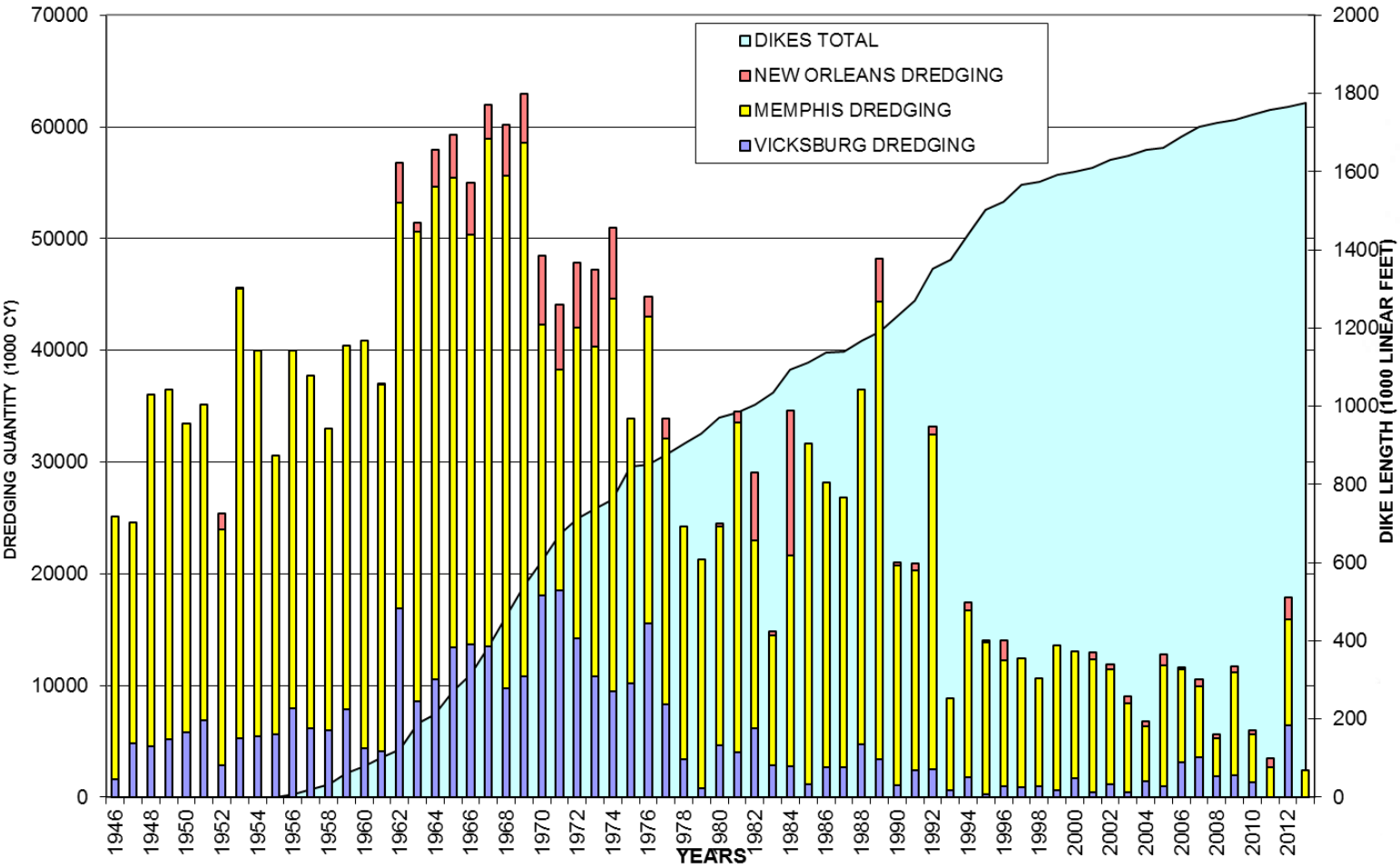


2004

Restoring America's
Greatest River Plan
(revised in 2015)

Available online at
www.lmrcc.org

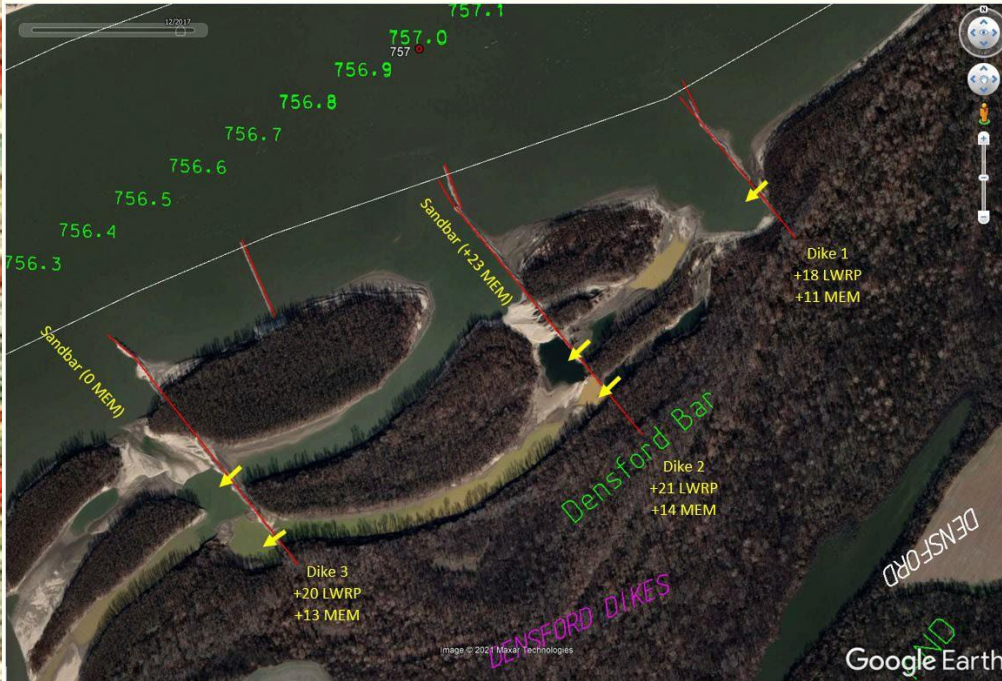
CUMULATIVE DIKE LENGTHS & DREDGING MISSISSIPPI RIVER



Rates of aquatic habitat loss and floodplain changes

DENSFORD AQUATIC HABITAT REHABILITATION

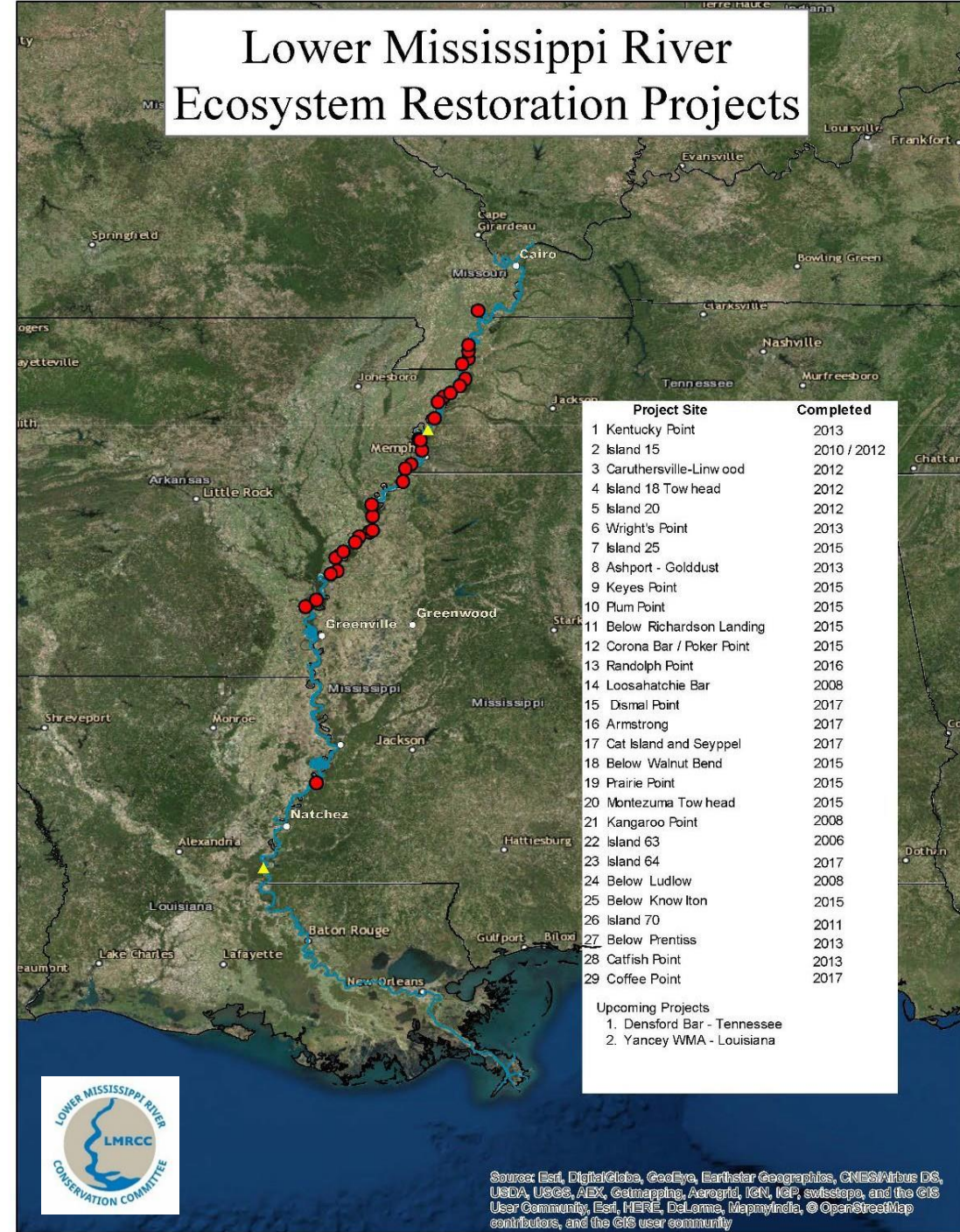
August 2022





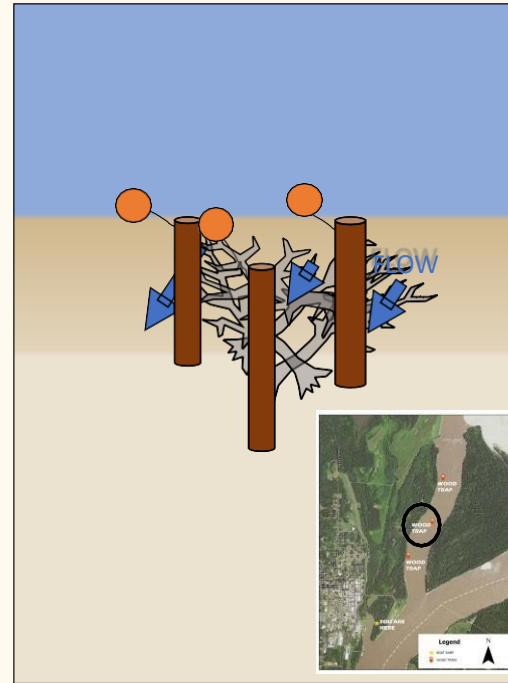
<https://www.youtube.com/user/LMRCCvideos>

Lower Mississippi River Ecosystem Restoration Projects



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community




Woody Debris Traps in Secondary Channels




Importance of structural diversity and restoration potential



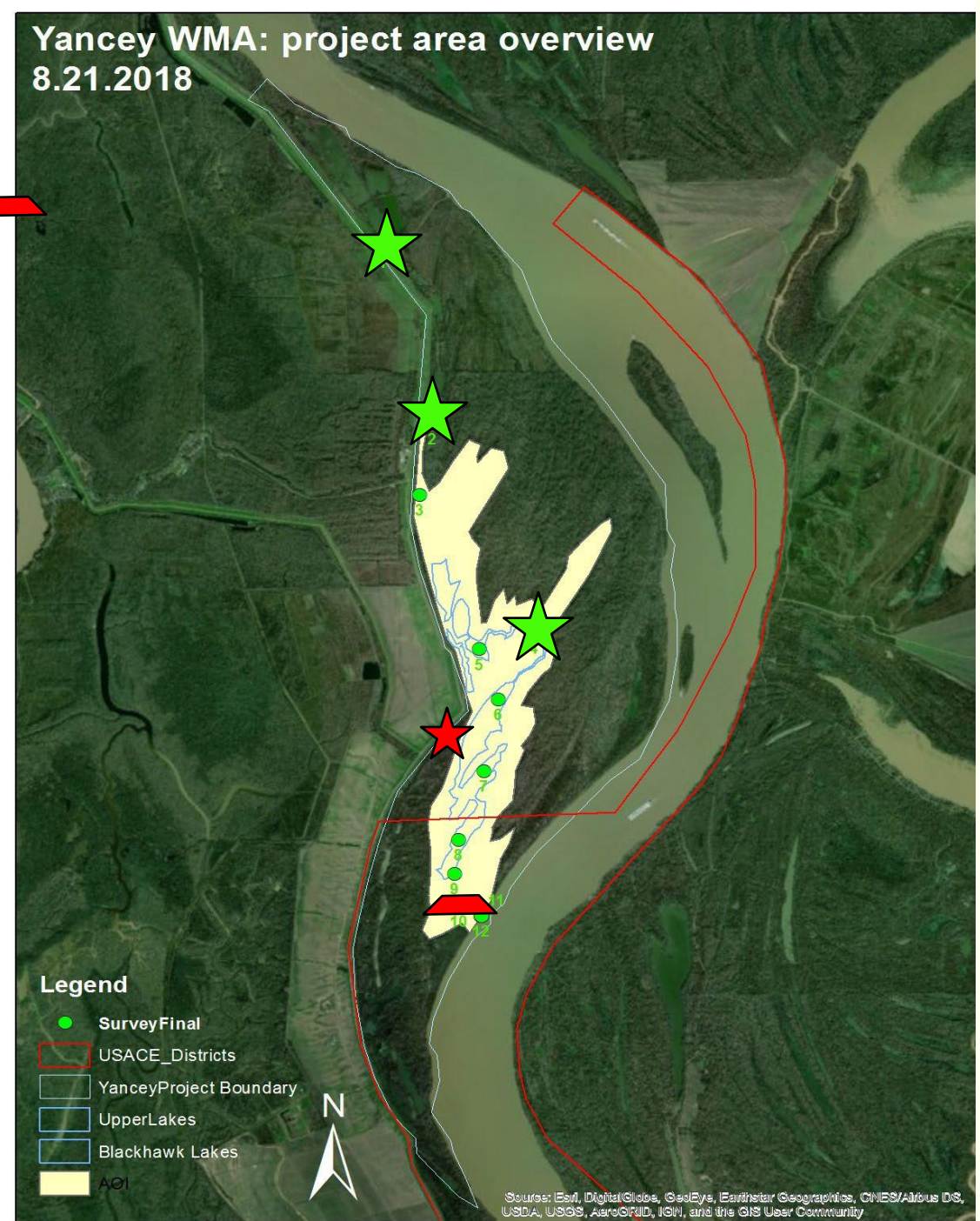
R.K. Yancey Blackhawk Scar Lakes Ecosystem Restoration and Monitoring

- 700 acres – restored floodplain hydrology – weir replacement 
- 5 miles – stream reconnection – 3 culvert replacements 
- Improve boat launch access 
- Habitat use, abundance, life history of Alligator gar and changes in trophic ecology associated with gar floodplain use in restored areas
- Provide management recommendations to the general public based on lessons learned

 Floodplain changes through time



Yancey WMA: project area overview
8.21.2018



Batture Reforestation

- 32,000+ acres enrolled or pending enrollment through Wetland Reserve Enhancement Partnership (WREP).
- Targeting the most flood-prone and marginal farmland in the active floodplain, or "batture."
- Converting flooded farmland to forest can save taxpayers hundreds of dollars or more per acre in avoided costs.



Nutrient and carbon sequestration rates



United States Department of Agriculture
Natural Resources Conservation Service



Recreation

★ Boat ramps/Access, Trails, Outfitters, Riverfront Parks





Lower Mississippi River Resource Assessment -Authorization-

Section 402 of WRDA 2000:

The Secretary, in cooperation with the Secretary of the Interior and the States of Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee, shall undertake for the Lower Mississippi River system:

- (1) an assessment of information needed for river-related management;
- (2) an assessment of natural resource habitat needs;
- (3) an assessment of the need for river-related recreation and access.

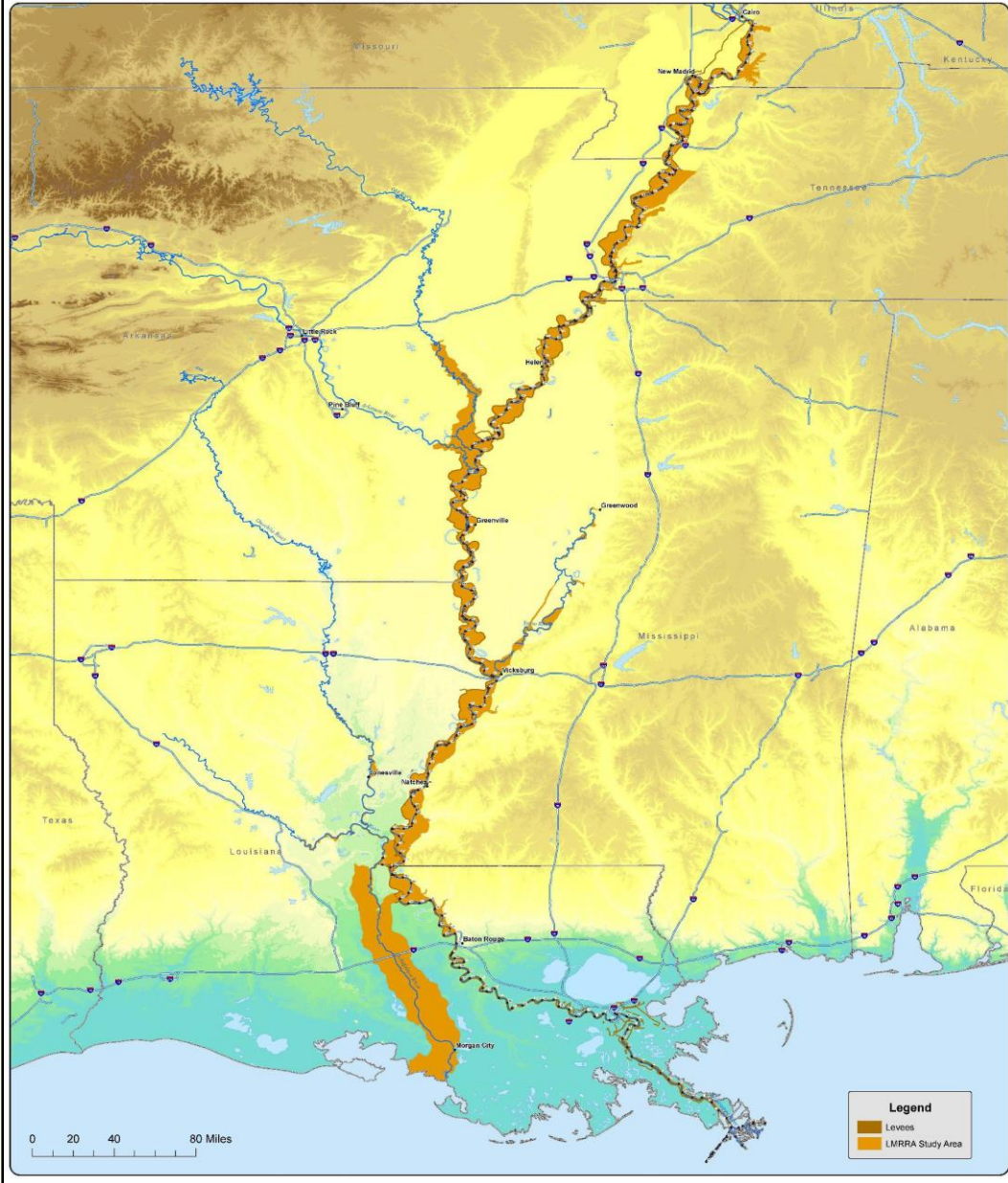
Cost:

\$1.67 Million

- \$1.25M Federal
- \$416,000 non-Federal



LOWER MISSISSIPPI RIVER RESOURCE ASSESSMENT STUDY - OVERVIEW



Lower Mississippi River Resource Assessment

2012 - 2016

Assessments of:

- (1) **Information** needed for river-related management;
- (2) Natural resource **habitat** needs;
- (3) Need for river-related **recreation** and **access**.



LMRRA Recommendations



Data Science and Communications Program



Habitat Restoration and Management Program



Recreation Program



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 & LMVJV	\$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.

CONSERVATION REACHES

Priority Conservation Reach Studies

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.)

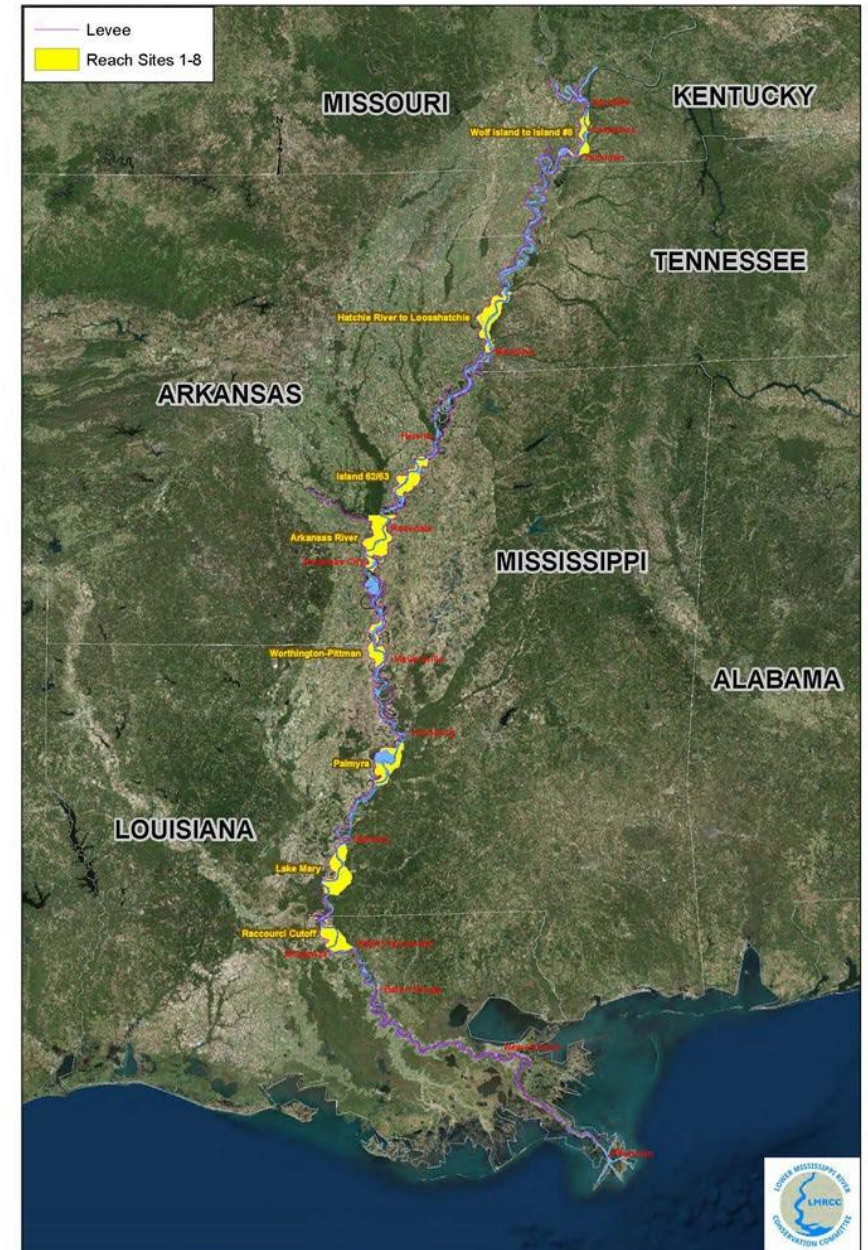
Possum (Worthington-Pittman) Reach
RM 524 – 490 (34 mi.)

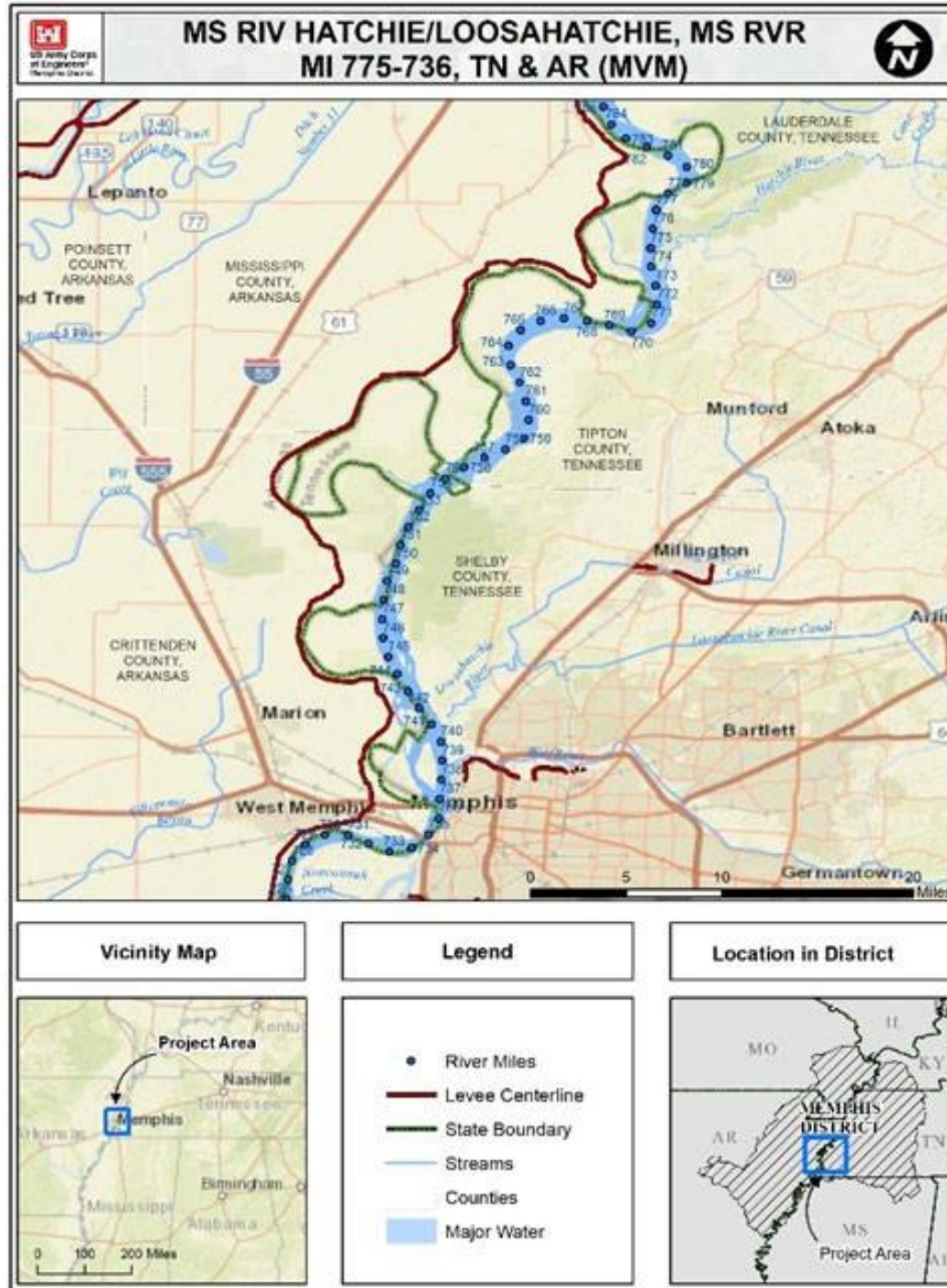
Palmyra River Reach
RM 431 – 398 (33 mi.)

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

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

LMRRA Conservation Reach Study Restoration Site Reaches 1-8





HATCHIE/LOOSAHATCHIE - GEOGRAPHIC COMPLEXES

Sunrise-Island 34

Island 35-Dean Island

Brandywine

Island 40/41

Redman Point-
Loosahatchie Bar

Hopefield Point-Big
River Park

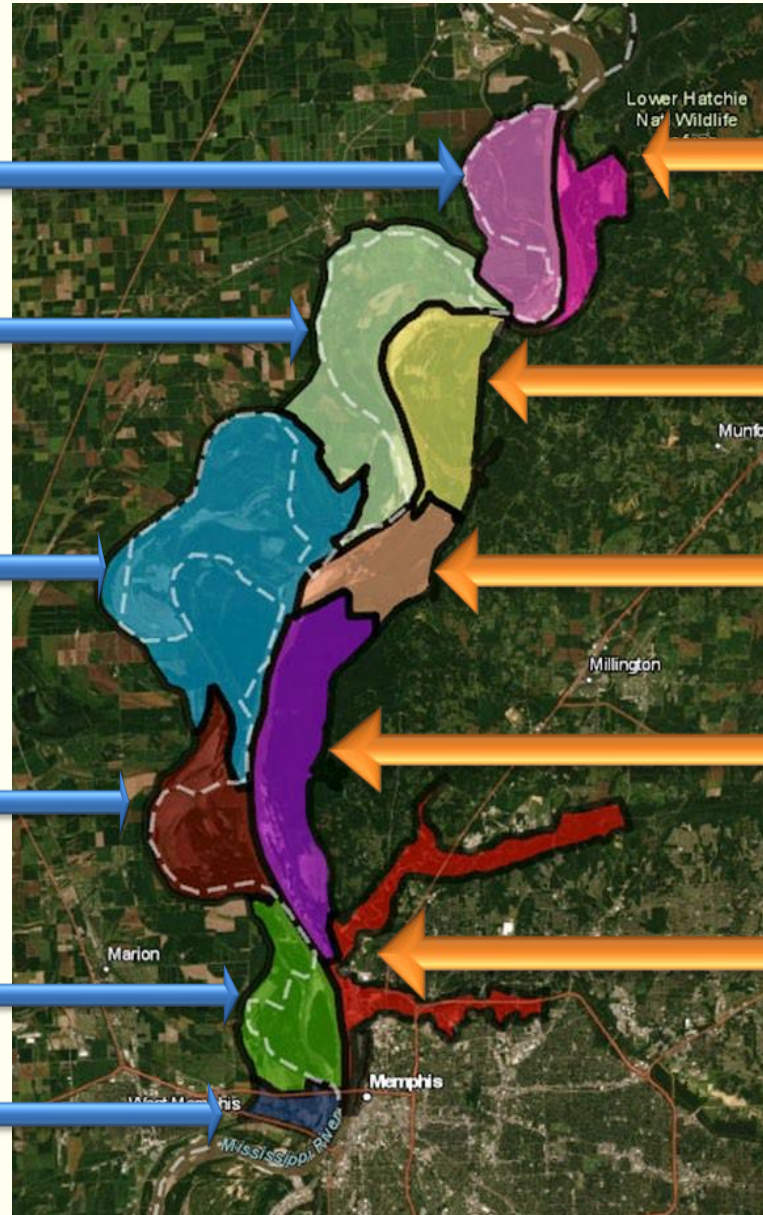
Hatchie Towhead Randolph

Richardson Cedar Point

Densford

Meeman Shelby Forest-Eagle Lake

Loosahatchie River-Wolf River



Study Goal and Objectives

GOAL: To restore ecological structure and function to the mosaic of habitats along the Mississippi River including secondary channels and other aquatic habitat; floodplain forests; and several scarce vegetative communities such as wetlands, rivercane, 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.

- Metric to measure performance: % increase mast production BLH, % increase in Cypress/Tupelo, % seasonal herbaceous wetland species, % increase in rivercane, % increase riparian buffer.

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

- Metric to measure performance: Increased connectivity from bathymetric surveys, increase of large woody debris in secondary channels

OBJECTIVE 3: Increase quality of the diverse mosaic of floodplain waterbodies (including but not limited to meander scarps, sloughs, crevasses, and borrow pits) and optimize their aquatic connectivity with the Mississippi River to support critical life history requirements of priority species.

- Metric to measure performance: Increased connectivity from bathymetric and LIDAR surveys; increased habitat complexity of floodplain waterbodies (depths, shoreline sinuosity, riparian vegetation.)

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

- Metric to measure performance: usage

Ecological Models

<u>Model</u>	<u>Habitat Addressed</u>	<u>Associated Objective</u>	<u>Units of Model Output</u>	<u>Certified Model Status</u>
Borrow Area HSI Fish Diversity Model	Borrow Areas and small floodplain lakes	3-Floodplain waterbodies	Habitat Units	Certified for Regional Use
HGM - regional guidebook for the MS Alluvial Valley	Vegetated Wetlands (BLH, Seasonally herbaceous wetlands, riparian, cypress tupelo, moist soil,	1-Vegetative Mosaic	Functional Capacity Units	Certified for Regional Use
LMR Floodplain Waterbody Bidirectional Connectivity Model	Parapotamal and Plesiopotamal Floodplain waterbodies (slackwater fish guild)- Slough (lentic aquatic), secondary channels (lotic aquatic)	3-Floodplain waterbodies	Habitat Units	Certification underway with PCX
LMR Floodplain Waterbody Wetland Isolation model	Plesiopotamal Floodplain waterbodies (wetland fish guild) - Borrow and slough	3-Floodplain waterbodies	Habitat Units	Certification underway with PCX
LMR Unidirectional Channel Connectivity Model	Eupotamal secondary channels and meander scarps (benthic aquatic invertebrates and rheophilic fish guild)	2-Large River	Habitat Units	Certification underway with PCX
LMR Aquatic Invertebrate Substrate model	Large River Substrates (e.g., large woody debris) -Main Channel, Secondary Channels	2-Large River	Habitat Units	Certification underway with PCX
LMR River Training Structure Riverine Eddy Model	Large river eddy, scour hole, and bank scallop habitats around river training structures	2-Large River	Habitat Units	Certification underway with PCX

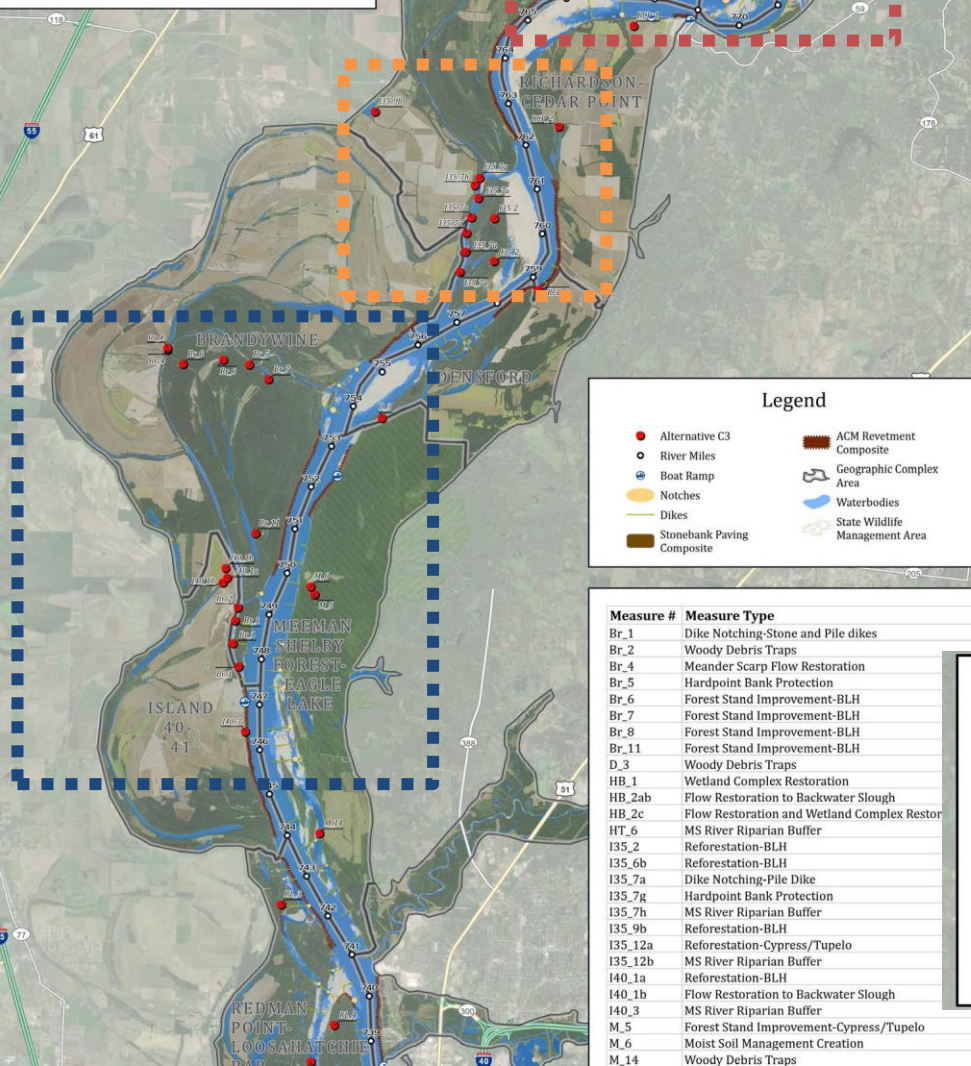
Summary of Alternative C3 TSP Features

Feature	Habitat	Total # measures	Complexes
Reforestation/Forest Stand Improvements	BLH	5	Brandywine, Redman Point Loosahatchie Bar
Woody Debris Traps	Secondary Channels	5	Brandywine, Densford, Meeman Shelby, Loosahatchie Bar, Sunrise Island 34
Dike Notching	Secondary Channels	4	Brandywine, Island 35, Redman Point Loosahatchie Bar, Sunrise Island 34
Flow Restoration	Meander Scarp	2	Brandywine, Sunrise Island 34
Flow Restoration	Slough	2	Hopefield Point Big River, Island 40/41
Reforestation/Forest Stand Improvement	Cypress Tupelo	4	Island 35, Meeman Shelby, Richardson Cedar Point, Sunrise Island 34
Reforestation/Forest Stand Improvement	Riverfront Forest/Riparian Buffer	10	Island 35, Island 40/41, Richardson Cedar Point
Wetland Complex Restoration	Seasonally Herbaceous Wetland/ River Cane	3	Hopefield Point Big River, Richardson Cedar Point
Moist Soil Management	Moist Soil	1	Meeman Shelby
Bank Protection	BLH/Secondary Channels	2	Brandywine, Island 35
		38 Total Measures	

TENTATIVELY SELECTED PLAN

Hatchie - Loosahatchie Ecosystem Restoration Study

ALTERNATIVE C3



Legend

- Alternative C3
- River Miles
- ⚓ Boat Ramp
- Notches
- Dikes
- Stonebank Paving Composite
- ACM Revetment Composite
- ⬜ Geographic Complex Area
- Waterbodies
- State Wildlife Management Area

Measure #	Measure Type
Br_1	Dike Notching-Stone and Pile dikes
Br_2	Woody Debris Traps
Br_4	Meander Scarp Flow Restoration
Br_5	Hardpoint Bank Protection
Br_6	Forest Stand Improvement-BLH
Br_7	Forest Stand Improvement-BLH
Br_8	Forest Stand Improvement-BLH
Br_11	Forest Stand Improvement-BLH
D_3	Woody Debris Traps
HB_1	Wetland Complex Restoration
HB_2ab	Flow Restoration to Backwater Slough
HB_2c	Flow Restoration and Wetland Complex Restor
HT_6	MS River Riparian Buffer
I35_2	Reforestation-BLH
I35_6b	Reforestation-BLH
I35_7a	Dike Notching-Pile Dike
I35_7g	Hardpoint Bank Protection
I35_7h	MS River Riparian Buffer
I35_9b	Reforestation-BLH
I35_12a	Reforestation-Cypress/Tupelo
I35_12b	MS River Riparian Buffer
I40_1a	Reforestation-BLH
I40_1b	Flow Restoration to Backwater Slough
I40_3	MS River Riparian Buffer
M_5	Forest Stand Improvement-Cypress/Tupelo
M_6	Moist Soil Management Creation
M_14	Woody Debris Traps



Legend

- Alternative C3
- River Miles
- ⚓ Boat Ramp
- Notches
- Dikes
- Stonebank Paving Composite
- ACM Revetment Composite
- ⬜ Geographic Complex Area
- Waterbodies
- State Wildlife Management Area





Lower Mississippi River / Batture Needs

Data Science and Communications Program

Interdisciplinary Communication and Coordination
Sedimentation Rates
Nutrient and Carbon Sequestration

Habitat Restoration and Management Program

Habitat Mapping
Habitat Loss
Floodplain Changes
Structural Diversity
Floodplain Features - Flowlines / Obstructions
Ecological Responses

Recreation Program

Boat ramps/ Access
Trails
Outfitters
Riverfront Parks

****Sustainable
Monitoring and
Restoration Program****

QUESTIONS?

Angeline Rodgers
angeline_rodgers@fws.gov
(601) 618-6034

<http://www.lmrcc.org>

<https://www.youtube.com/user/LMRCCvideos>

<https://www.fws.gov/office/lower-mississippi-river-fish-and-wildlife-conservation>

