Upper Mississippi River Restoration Program Coordinating Committee Quarterly Meeting

May 22, 2024

Highlights and Action Items

Vanessa Perry announced that she accepted a position as Mississippi River Coordinator with the Wisconsin Department of Natural Resources. She will start her new role in mid-June.

Chad Craycraft announced that he has accepted a position with the Illinois Department of Corrections.

Program Management

- UMRR received $55 million in FY 24 appropriations and has obligated $22,683,924 to date.
- **The FY 25 President's Budget includes $55 million for UMRR. The draft FY 25 plan of work for UMRR at $55 million is largely consistent with the FY 24 plan of work with an increase in Regional Program Management.**
- The President's Budget includes over $630 million for six ecosystem projects and programs as follows:
  - South Florida Ecosystem Restoration, FL $443,725,000
  - Columbia River Fish Mitigation $ 75,200,000
  - **Upper Mississippi River Restoration $ 55,000,000**
  - Missouri River Fish and Wildlife Recovery $ 26,950,000
  - Louisiana Coastal Area Ecosystem Recovery $ 10,000,000
- **The Senate's draft WRDA 2024 language includes two sections relevant to UMRR:**
  - **Sec. 334 – increases the annual authorization for LTRM from $15 million to $25 million. If passed, UMRR's total annual authorized funding level would be $100 million.**
  - **Sec. 223 – Directs the Government Accountability Office (GAO) to investigate questions related to Project Partnership Agreements. If passed, within one year, the GAO would have to report on its analysis and any recommendations for changes to law or policy.**

  The full draft Senate WRDA language is available at the following link: https://www.epw.senate.gov/public/_cache/files/b/1/b167600c-12de-4692-9ee6-4f250c749547/C56598E039ECB7FC664532AD3C332761.carper-capito-ans.pdf

HREP Selection

- River Teams have held workshops to identify future HREPs. On April 9-10, 2024, the FWIC and RRAT jointly convened an Illinois River-specific subgroup workshop.
- **In June, the Program Planning Team (PPT) anticipates convening virtually to review progress on the HREP Selection process.** The PPT includes the UMRR Coordinating Committee, District HREP-Managers, and District-based River Team Chairs. **Marshall Plumley will send an availability request to PPT members.**

Strategic Planning

- On February 28, 2024, Chrissa Waite led the UMRR Coordinating Committee and quarterly meeting attendees through an initial Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis.

- **On April 29, 2024, Marshall Plumley distributed an email to UMRR partners, river communities, and stakeholders requesting existing documents and resources addressing opportunities, challenges, and perspectives pertaining to the river and floodplain.** Resources might include organizational strategic plans, comprehensive plans or economic development plans with a UMRS focus, or reports and studies on community perspectives, among others. **The Strategic Planning Team will review and analyze provided resources for alignment with the UMRR authorization. Plumey reported that nearly 20 resources have been received to date. He requested additional resources be provided to himself and Andrew Stephenson by May 27, 2024.**

- **Participants at the May 7-9, 2024 UMRR Workshop reviewed the initial SWOT analysis results and identified the following critical issues facing UMRR over the next 10 years:**
  - **Capacity: partner staff, USACE staff, contractors** to support the growing program to most effectively address environmental needs, maintain quality and retention
  - **Increasing resiliency of projects** to better combat climate change threats/invasives/watershed influences
  - **Data collection and analysis** prior to projects

- **Chrissa Waite led the UMRR Coordinating Committee and quarterly meeting attendees through a breakout group discussion of how UMRR strengths may help to address the critical issues facing UMRR over the next 10 years. Exercise outcomes will be incorporated into the strategic planning process.**

- **The Strategic Planning Team is scheduled to meet July 23-25, 2024 in the St. Paul – Minneapolis Metro area. The Team will review input from the quarterly meetings, workshop, existing resources request and 2015-2025 Strategic Plan review to develop draft goals and objectives for the next strategic plan.**

Workshop

- On May 7-9, 2024 UMRR held a workshop in Bettendorf, IA. **The goals of the workshop were to transfer knowledge and connect UMRR partners. The workshop had 105 in-person participants and 15-20 virtual participants representing 16 agencies and organizations. This workshop had more NGO participants than the 2019 workshop.** The workshop agenda allowed for many breakout sessions and small group discussions. PollEverywhere was used to promote input on many issues. **Important items not addressed at the workshop will be addressed through program-wide webinars or other efforts.**

Report to Congress

- In November 2022, the UMRR 2022 Report to Congress (RTC) was submitted to the ASA(CW)'s office for review. **The ASA(CW)'s office transmitted the report to Congress in late-March 2024. Marshall Plumley will send the final approved report as a PDF to Coordinating Committee members this week. Rock Island District Public Affairs will post the report to the UMRR website in the coming weeks and issue a press release and post on social media. Plumley will distribute the link to the online version when it is available with a request to Coordinating Committee members for the desired number of hard copies for each agency.**

- **The UMRR Communications and Outreach Team is helping to develop a four-page flier for the RTC. The Previous RTC's flier was used extensively for communication efforts. Development of a communications toolkit for the RTC, like for the Status and Trends Report, with geographically specific talking points, will be considered as well.**

- Plumley will adjust planning and tracking processes for the next Report to Congress.

Communications

- The UMRR Communications and Outreach Team (COT) participated in World Migratory Bird Day on May 11, 2024, with a coordinated social media post.

- The COT held initial discussions regarding updating UMRR outreach materials and kiosks at interpretive centers along the river.

- The COT will review communication needs and priorities identified by UMRR workshop participants.

- **The COT is finalizing plans for its inaugural UMRR photo contest. Contributed photos will bolster UMRR's program materials and communication efforts. The photo contest will be open to all UMRR partners. The photo submission period will be August 1 to October 31, 2024; however, photos can be from any season or taken during prior years. Photos can be submitted under one of the following categories:**
  - **Before/After, Construction, or Benefits of HREPs**
  - **Connecting People with Nature, Human Use, or Public Interaction**
  - **Natural Features, Scenic Views, or Landscapes**
  - **Cultural or Historic Features**
  - **LTRM – Monitoring in Action**

  Winners will be featured in the Spring 2025 edition of "Our Mississippi" magazine and may potentially receive UMRR gear or a framed copy of their photo.

- **Rachel Perrine will distribute an explanation of the photo contest to UMRR Coordinating Committee members to share with their agency staff.**

External Communications:

- Events celebrating the Upper Mississippi River National Wildlife and Fish Refuge 100th anniversary will be held on the June 7, 8, 22, 2024

- On May 22, 2024, the Mississippi River Traveler podcast released an episode focused on the refuge.

- On June 13, 2024, Jeff Houser and Ed Britton will present webinars on UMRR as part of the Mississippi River Network's River Days of Action.

Habitat Restoration

- MVP's Big Lake Pool 4 HREP was featured in a presentation at the UMRR workshop and represents a great example of the benefits of HREP and LTRM integration. The presentation may be considered for a recorded webinar later this year.

- **MVR anticipates holding a ribbon cutting for Beaver Island HREP in late-summer 2024.**

- Minor flooding in MVS is impacting some HREPs.

Long Term Resource Monitoring and Science

- The LTRM FY 2024 budget allocation is $7 million ($5.5 million for base monitoring and $1.5 million for analysis under base) with an additional $6.85 million available for "science in support of restoration and management." **LTRM has allocated over $6.6 million for science in support of restoration and management to fund macroinvertebrate sampling, two years of chloride monitoring, three additional years of resilience work, and one year of landscape pattern analysis. Funding will also support an expansion of the topobathy pilot studies to Lower Pool 13, advancing the next priorities identified through LTRM implementation planning, and includes approximately $2 million in funding for eight science proposals.**

- **Large-scale systemic topobathy acquisition in Pools 24, 25, 26 and the Open River is being closely coordinated with the Navigation and Ecosystem Sustainability Program, which may contribute $10 million toward acquisition.**

- Accomplishments of the second quarter of FY 24 include publication of the following manuscripts:
  - *Network Connectivity Contributes to native small-bodied fish assemblages in the Upper Mississippi River System*
  - *Influence of Sediment Oxygen Demand on Winter Hypoxia in Ice-Covered Backwater Lakes of the Upper Mississippi River*
  - *Flowering Rush Mapping, Treatment, and Treatment Effectiveness monitoring on the Upper Mississippi River National Wildlife and Fish Refuge.*

- Land Cover Land Use (LCU) updates are anticipated to be completed in FY 26. **Completed areas include Pools 1-4, 7-13, 26, St. Croix, Alton, La Grange, and Open River South. Pools 6 and 22 are in review. Efforts in FY 24 will focus on Pools 5, 5a, 24, and 25.** Efforts in FY 25 will focus on Pools 14, 18-21, Peoria. The area from Lockport to Starved Rock will be completed in FY 26.

Implementation Planning

- Two information needs, "Geomorphic Trends in the UMRS" and "River Gradients from Pool 14 to Pool 25" were funded in FY 23. **Two additional information needs, "Floodplain Vegetation Change Across the System" and "Lower Trophic Contributions (zooplankton and phytoplankton)," were identified for funding in FY 24.** Turtle bycatch scute marking is one aspect of the "Terrestrial and Aquatic Herpetofauna" that will be explored more this year for implementation in FY 25.

Science Proposals

- The A-Team met on April 16, 2024, in La Crosse, with principal investigators to discuss thirteen science proposals identified during the January Science Meeting. A-Team members submitted proposal rankings by April 23, 2024. On April 25, 2024, the A-Team convened virtually to discuss rankings and unanimously approved a final project rankings list. **On May 2, 2024, Matt O'Hara, A-Team Chair, met with the UMRR LTRM Management Team, to discuss final funding recommendations for science proposals. They agreed to fund eight proposals** (seven fully and one partially) based on available funding**.** The decision included delaying full funding for one project to support another high-priority project. **Projects that were not funded in FY 24 can be considered for funding in FY 25. O'Hara recommended endorsement of the eight science proposals to the UMRR Coordinating Committee.**

- **The UMRR Coordinating Committee endorsed the following Science Proposals for FY24 funding at approximately $2 million:**

- Associations among hydrogeomorphology, water chemistry, and the distribution and abundance of biota in the Upper Mississippi River under climate change.
- Generating future hydrology and water temperature projections for the UMRS using hybrid deep learning (FY 25 only)
- Submersed plant responses to wind, waves, water velocity, and shear stress
- In-depth characterization of phytoplankton communities and toxicity across connectivity gradients along 450 miles of the Upper Mississippi River System
- Hindcasting and forecasting abiotic drivers of the UMRS fish populations and advancing management and research tools for non-game fishes
- Using sUAS to monitor and survey regeneration and recruitment in areas of forest canopy loss
- Understanding the role of sub-surface hydrology and soil characteristics on floodplain vegetation in the UMRS through space and time
- Strategic approach to identify HREP features that promote dense and diverse mussel assemblages

Science Proposals were regarded as the most comprehensive and highest quality set of science proposals reviewed to date.

Showcases:

- Steve Gustafson presented on the Beaver Island HREP located in Pool 14. Beaver Island is one of the largest islands on the Upper Mississippi River. Project Goals are to restore and protect off-channel aquatic and wetland habitat and restore floodplain forest habitat. Project features include backwater dredging, water control structure and fish structures, topographic diversity and timber stand improvement, as well as island stabilization and rock substrate to support mussels. The project came in under budget due to contractor ingenuity including sinking barges to temporarily store dredge material for later placement. **A ribbon cutting for the project is anticipated for late-summer 2024.**

- Shaley Valentine presented on research to determine the origins of small-bodied fish in the UMRS. Tributaries are important physical features, nodes of connectivity, and habitat in the UMRS and differ in temperature, substrates, chemistry and other characteristics. Trace elements such as Strontium and Calcium can be measured in otoliths that record environmental history of water bodies. Results show that about twenty-five percent of all fish originated from tributary or other river reaches.

Lower Mississippi River Comprehensive Study

- Cherie Price provided an overview of the Lower Mississippi River Comprehensive Management Study (LMRCMS), authorized in WRDA 2020, Section 213. The purpose of the Study is to identify recommendations of actions to be undertaken under existing authorities or after congressional authorization for the comprehensive management of the basin for multiple purposes. The Study area includes portions of seven states and six USACE districts. A series of scoping meetings with federal and state agencies, Tribal Nations, NGOs, academics, and the public identified 137 problems, 146 opportunities, and over 400 potential measures to consider in developing alternatives. Price presented a summary of the results pertaining to flood risk management, navigation, ecosystem restoration, and recreation from the public scoping meeting in Cape Girardeau, MO and Cairo, IL. Next steps are to develop a public scoping report and conduct additional public engagement as well as screen measures and develop a list of alternatives. The study will produce a 1D system-wide hydraulic model to test different operational scenarios along the river and a sediment transport model to evaluate operational scenarios and determine long term geomorphic changes in the channel bed.

Other Business

Upcoming quarterly meetings are as follows:

- **August 2024 – Minneapolis-St. Paul Metro**
  - UMRBA quarterly meeting – August 6
  - **UMRR Coordinating Committee quarterly meeting – August 7**
- **November 2024 – St. Louis**
  - UMRBA quarterly meeting – November 19
  - **UMRR Coordinating Committee quarterly meeting – November 20**
- **February 2025 – Virtual**
  - UMRBA quarterly meeting – February 25
  - **UMRR Coordinating Committee quarterly meeting – February 26**

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REGIONAL MANAGEMENT AND PARTNERSHIP COLLABORATION

- FY 2024 Fiscal Update and FY 25 Outlook
- HREP Selection
- UMRR Strategic Plan
- UMRR Workshop
- UMRR 2022 Report to Congress

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FY 2024 FISCAL UPDATE AND FY 2025 OUTLOOK

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FINANCIAL REPORTING 2ND QTR. FY 24

UMRR Quarterly Budget Report: St. Paul District
FY2024 Q2; Report Date: Thu May 02 2024

Habitat Projects

Project Name	Cost Estimates Non-Federal	Cost Estimates Federal	Cost Estimates Total	FY2024 Financials Carry In	FY2024 Financials Allocation	FY2024 Financials Funds Available	FY2024 Financials Actual Obligations
Lower Pool 10 Island and Backwater Complex	-	$32,428,000	$32,428,000	$78,068	$5,000,000	$5,078,068	$268,953
Lower Pool 4, Big Lake	-	$18,000,000	$18,000,000	$29,071	$250,000	$279,071	$155,026
Lower Pool 4, Robinson Lake, MN	-	$12,000,000	$12,000,000	$29,061	$550,000	$579,061	$158,163
McGregor Lake	-	$23,550,000	$23,550,000	$60,065	$350,000	$410,065	$98,035
Reno Bottoms	-	$38,965,000	$38,965,000	$21,379	$5,000,000	$5,021,379	$1,036,536
Total	-	$124,943,000	$124,943,000	$217,644	$11,150,000	$11,367,644	$1,716,713

Habitat Rehabilitation

Subcategory	FY2024 Financials Carry In	Allocation	Funds Available	Obligations
District Program Management	-	-	-	$195,637
Total	-	-	-	$195,637

Regional Program Administration

Subcategory	FY2024 Financials Carry In	Allocation	Funds Available	Obligations
Habitat Eval/Monitoring	-	$425,000	$425,000	$182,661
Total	-	$425,000	$425,000	$182,661

	Carry In	Allocation	Funds Available	Actual Obligations
St. Paul Total	$217,644	$11,575,000	$11,792,644	$2,095,011

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FINANCIAL REPORTING 2ND QTR. FY 24

UMRR Quarterly Budget Report: Rock Island District
FY2024 Q2; Report Date: Thu May 02 2024

Habitat Projects

Project Name	Cost Estimates Non-Federal	Cost Estimates Federal	Cost Estimates Total	FY2024 Financials Carry In	FY2024 Financials Allocation	FY2024 Financials Funds Available	FY2024 Financials Actual Obligations
Beaver Island	-	$25,288,000	$25,288,000				$48,846
Green Island, IA	-	$16,600,000	$16,600,000	$131,858	$1,900,000	$2,031,858	$591,076
Huron Island	-	$15,773,000	$15,773,000	$2,383	-	$2,383	$1,936
Keithsburg Refuge	-	$29,643,000	$29,643,000	$78,794	$500,000	$578,794	$206,687
Lower Pool 13	-	$25,288,000	$25,288,000	-	$550,000	$550,000	$12,240
Lower Pool 13 Phase II	-	-	-	$8,035	$600,000	$608,035	$172,606
Pool 12 (Cassidy)	-	$9,000,000	$9,000,000	$45,550	$600,000	$645,550	$303,881
Pool 19 Islands	-	$4,000,000	$4,000,000	-	$600,000	$600,000	$107,370
Quincy Bay, IL	-	$25,000,000	$25,000,000	$68,096	$700,000	$768,096	$349,817
Steamboat Island	-	$41,977,000	$41,977,000	$54,700	$8,200,000	$8,254,700	$6,490,769
Total	-	$217,569,000	$217,569,000	$389,416	$13,700,000	$14,089,416	$7,991,235

Habitat Rehabilitation

Subcategory	FY2024 Financials Carry In	Allocation	Funds Available	Obligations
District Program Management			-	$80,493
Total			-	$80,493

Regional Program Administration

Subcategory	FY2024 Financials Carry In	Allocation	Funds Available	Obligations
Adaptive Management	$2,839	$280,000	$282,839	$92,124
Habitat Eval/Monitoring	$119,857	$425,000	$543,857	$95,087
Model Certification/Regional HREP	-	$100,000	$100,000	$25,067
Public Outreach		$60,000	$60,000	$3,225
Regional Program Management	$162,211	$1,080,000	$1,242,211	$750,827
Regional Project Sequencing		$125,000	$125,000	$48,190
Total	$283,896	$2,400,000	$2,683,896	$965,460

Regional Science and Monitoring

Subcategory	FY2024 Financials Carry In	Allocation	Funds Available	Obligations
Long Term Resource Monitoring	$174	$5,580,000	$5,580,174	$4,944,050
Science in Support of Restoration/Management		$8,260,000	$8,260,000	$1,030,391
Total	$174	$13,840,000	$13,840,174	$5,974,443

	Carry In	Allocation	Funds Available	Actual Obligations
Rock Island Total	$673,486	$29,950,000	$30,623,486	$15,011,591

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FINANCIAL REPORTING 2ND QTR. FY 24

UMRR Quarterly Budget Report: St. Louis District
FY2024 Q2; Report Date: Thu May 02 2024

Habitat Projects

Project Name	Cost Estimates Non-Federal	Cost Estimates Federal	Cost Estimates Total	FY2024 Financials Carry In	FY2024 Financials Allocation	FY2024 Financials Funds Available	FY2024 Financials Actual Obligations
Clarence Cannon	-	$29,800,000	$29,800,000	$51,513	$650,000	$701,513	$167,419
Crains Island	-	$36,562,000	$36,562,000	$3,340	$4,825,000	$4,828,340	$1,623,323
Gilead Slough	-	$11,000,000	$11,000,000	$2,454	$550,000	$552,454	$135,025
Harlow Island	-	$37,971,000	$37,971,000	-	$925,000	$925,000	$66,671
Oakwood Bottoms	-	$34,200,000	$34,200,000	-	$525,000	$525,000	$76,407
Piasa - Eagle's Nest Islands	-	$26,746,000	$26,746,000	-	$3,950,000	$3,950,000	$676,111
Red's Landing Wetlands	-	$16,573,680	$16,573,680	-	$475,000	$475,000	$146,115
West Alton Missouri Islands	-	$14,500,000	$14,500,000	-	$400,000	$400,000	$212,694
Yorkinut Slough, IL	-	$8,500,000	$8,500,000	$5,721	$750,000	$755,721	$208,055
Total	-	$215,852,680	$215,852,680	$63,028	$13,050,000	$13,113,028	$3,311,820

Habitat Rehabilitation

Subcategory	FY2024 Financials Carry In	Allocation	Funds Available	Obligations
District Program Management	$46,864		$46,864	$261,653
Total	$46,864		$46,864	$261,653

Regional Program Administration

Subcategory	FY2024 Financials Carry In	Allocation	Funds Available	Obligations
Habitat Eval/Monitoring		$425,000	$425,000	$85,380
Total	-	$425,000	$425,000	$85,380

	Carry In	Allocation	Funds Available	Actual Obligations
St. Louis Total	$109,892	$13,475,000	$13,584,892	$3,658,853

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FY24 PLAN OF WORK

	Budget	Obligations as of 1 May
TOTAL FY24 Program	**$55,000,000**	**$22,683,924**
Regional Administration and Program Efforts	**$ 1,675,000**	**$ 954,082**
Regional Management	$ 1,260,000	
Program Database	$ 100,000	
Program Support Contract (UMRBA)	$ 140,000	
Public Outreach	$ 50,000	
Regional Project Sequencing	$ 125,000	
Regional Science and Monitoring	**$15,325,000**	**$ 6,521,605**
LTRM (Base Monitoring)	$ 5,500,000	
UMRR Regional Science In Support Rehabilitation/Mgmt. (MIPR's, Contracts, and Labor)	$ 8,350,000	
UMRR Regional (Integration, Adapt. Mgmt.)	$ 200,000	
Habitat Evaluation (split between MVS,MVR,MVP)	$ 1,275,000	
District Habitat Rehabilitation Efforts (Planning and Construction)	**$38,000,000**	**$15,208,237**
St. Paul District	$11,150,000	
Rock Island District	$13,700,000	
St. Louis District	$13,050,000	41.2%
Model Cert.	$ 100,000	

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FY 24 APPROPRIATIONS

President's Budget	$55,000,000
House	$55,000,000
Senate	$55,000,000
FINAL APPROPRIATION	$55,000,000

FY 25 APPROPRIATIONS

President's Budget	$55,000,000

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FY 25 PRESIDENTS BUDGET

South Florida Ecosystem Restoration, FL	$443,725,000
Columbia River Fish Mitigation	$ 75,200,000
Upper Mississippi River Restoration	$ 55,000,000
Missouri River Fish and Wildlife Recovery	$ 26,950,000
Louisiana Coastal Area Ecosystem Restoration	$ 19,973,000
Poplar Island, MD	$ 10,000,000
Total	$630,848,000

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FY25 DRAFT PLAN OF WORK

	Budget
TOTAL FY25 Program	**$55,000,000**
Regional Administration and Program Efforts	**$ 2,225,000**
Regional Management	$ 1,735,000
Program Database	$ 120,000
Program Support Contract (UMRBA)	$ 145,000
Public Outreach	$ 100,000
Regional Project Sequencing	$ 125,000
Regional Science and Monitoring	**$15,925,000**
LTRM (Base Monitoring)	$ 6,500,000
UMRR Regional Science In Support Rehabilitation/Mgmt. (MIPR's, Contracts, and Labor)	$ 7,950,000
UMRR Regional (Integration, Adapt. Mgmt.)	$ 200,000
Habitat Evaluation (split between MVS,MVR,MVP)	$ 1,275,000
District Habitat Rehabilitation Efforts (Planning and Construction)	**$36,850,000**
St. Paul District	$ 9,900,000
Rock Island District	$13,925,000
St. Louis District	$12,925,000
Model Cert.	$ 100,000

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FY 25 PRESIDENTS BUDGET

HREP Feasibility

- TBD MVP
- Robinson Lake, MN
- Lower Pool 13 Phase II
- Lower Pool 11
- Pool 18 Forestry
- TBD 4th Qtr FY 24
- Gilead Slough, IL
- Reds Landing, IL
- Meredosia Island, IL

HREP Design & Construction

- McGregor Lake, WI
- Lower Pool 10 Islands, IA
- Reno Bottoms, MN
- Pool 12 Forestry, IL
- Quincy Bay, IL
- Keithsburg Division, IL
- Steamboat Island, IA
- Lower Pool 13, IA
- Green Island, IA
- Yorkinut Slough, IL
- West Alton Islands, MO
- Clarence Cannon, MO
- Crains Island, IL
- Piasa and Eagles Nest Islands, IL
- Harlow Island, MO
- Oakwood Bottoms, IL

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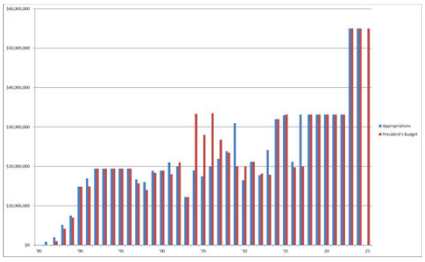
UMRR FUNDING

- From 2018-2022, Congress has funded the program to levels matching UMRR's full authorized annual amount of $33.17 million
- WRDA 2020 increased Authorization $55M (HREP = $40M / LTRM = $15M)
- FY 23 & FY 24 $55M Appropriation
- FY 25 PBUD $55M
- WRDA 2022 Authorization $90M (HREP = $75M / LTRM = $15M)



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SUPPORT FOR UMRR

United States Senate
WASHINGTON, DC 20510

January 31, 2024

The Honorable Shalanda Young
Director
Office of Management and Budget
725 17th Street, NW
Washington, DC 20503

The Honorable Michael L. Connor
Assistant Secretary of the Army - Civil Works
Department of the Army
108 Army Pentagon
Washington, DC 20310

Dear Director Young and Assistant Secretary Connor:

We write in continued support of the Army Corps of Engineers' (Corps) Upper Mississippi River Restoration (UMRR) program. The program has demonstrated its success in reversing trends of degradation of the Mississippi River ecosystem and increasing the abundance and quality of fish and wildlife habitat. Indeed, UMRR has proven that investing in the Upper Mississippi River ecosystem strengthens the nation's economy and quality of life for over 30 years. Therefore, we respectfully request that you include $55 million for UMRR in the President's Fiscal Year 2025 budget.

The UMRR program plays a critical role in habitat restoration to help ensure important ecological services and uses are sustained for future generations, such as clean water benefitting municipalities, manufacturers, and agricultural and energy producers. The Upper Mississippi is a major tourism and recreation hub, generating over $24.6 billion annually, with UMRR's habitat projects expanding the draw of visitors. UMRR restoration projects are tested and proven to address the most significant degrading influences to the ecosystem. UMRR invests significantly in data research of the habitats to better understand and improve the resiliency of the Upper Mississippi River.

The program helps ensure thousands of species of birds, fish, and other wildlife continue to thrive in their natural habitats in and along the Mississippi River. UMRR projects protect wetlands and lakes from fluctuating water levels and high sedimentation, recreate islands to provide refuge and food for many species of fish and wildlife, and restore natural diversity of water velocities and depths to improve fish habitat. Projects help protect against threats from invasive species, including Asian carp, that outcompete native fish and wildlife for food sources and limited habitat. Still more projects restore forest health and diversity.

It is imperative to build on the progress of the UMRR program to ensure it can continue to advance its mission and goals. FY 2025 promises to be another extraordinary year for UMRR with several high-profile projects planned for implementation, and more in the pipeline, provided the program continues to receive sufficient funding.

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UMRR has broad, bipartisan support across Illinois, Iowa, Minnesota, Missouri and Wisconsin, as well as support of the navigation industry and conservation interests. As you finalize the Army Corps of Engineers Fiscal Year 2025 budget, we encourage you to recommend $55 million for UMRR to continue to ensure this program has the resources needed to protect the river's integrity and wildlife for generations to come.

Thank you for your consideration of our request.

Sincerely,

Tammy Baldwin
United States Senator

Tammy Duckworth
United States Senator

Richard J. Durbin
United States Senator

Tina Smith
United States Senator

Amy Klobuchar
United States Senator

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POTENTIAL WRDA 2024 CHANGES TO UMRR

Senate SEC. 334. UPPER MISSISSIPPI RIVER PLAN. Section 1103(e)(4) of the Water Resources Development Act of 1986 (33 U.S.C. 652(e)(4)) is amended by striking "$15,000,000" and inserting "$25,000,000".

HREP $75,000,000 + LTRM $25,000,000

$100,000,000

POTENTIAL WRDA 2024 LANGUAGE

Senate SEC. 233. GAO STUDIES.

(b) REPORT ON PROJECT LIFESPAN AND INDEMNIFICATION CLAUSE IN PROJECT PARTNERSHIP AGREEMENTS.—
(2) SENSE OF CONGRESS.—It is the sense of Congress that—
(A) there are significant concerns about whether—
(i) the indemnification clause, which was first applied in 1910 to flood control projects, should still be included in project partnership agreements prepared by the Corps of Engineers for water resources development projects; and
(ii) non-Federal interests for water resources development projects should be required to assume full responsibility for OMRR&R of water resources development projects in perpetuity;

POTENTIAL WRDA 2024 LANGUAGE

Senate SEC. 233. GAO STUDIES.

(B) non-Federal interests have reported that the indemnification clause and OMRR&R requirements are a barrier to entering into project partnership agreements with the Corps of Engineers;
(C) critical water resources development projects are being delayed by years, or not pursued at all, due to the barriers described in subparagraph (B); and
(D) legal structures have changed since the indemnification clause was first applied and there may be more suitable tools available to address risk and liability issues.

POTENTIAL WRDA 2024 LANGUAGE

Senate SEC. 233. GAO STUDIES.

(3) ANALYSIS.—Not later than 1 year after the date of enactment of this Act, the Comptroller General shall conduct an analysis…
(5) REPORT.—On completion of the analysis under paragraph (3), the Comptroller General shall submit to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report that includes— (A) the results of the analysis; and (B) any recommendations for changes needed to existing law or policy of the Corps of Engineers to address those results.

HREP SELECTION

FUTURE HREP SELECTION

BLUF: Approved Fact Sheets available to the Program by the 3rd quarter of FY 25 (Apr – Jun 2025) for use in the FY 26 - FY 30 timeframe.

- Updated guidance provided to River Teams (FWWG, FWIC, RRAT)
  - Physical overlap with completed restoration efforts
  - Environmental Justice
  - Previously endorsed fact sheets
  - Cost/Project Size/Scope
  - Project Sponsor Requirements
- Support to River Teams
  - Single GIS viewer to input information across the region
  - Staff to support Environmental Justice analysis
  - HNA II & Status and Trends Webinars
- River Teams have held workshops
  - Illinois River workshop (FWIC & RRAT)

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SCHEDULE

- FWWG (St. Paul AOR)
  - 10 August Initial request
  - 9 January Pre-workshop meeting
  - 2 February Workshop
- FWIC (Rock Island AOR)
  - 26 October Pre-workshop meeting
  - 13 November Workshop
- RRAT Tech (St. Louis AOR)
  - 19 January Pre-workshop meeting
  - **7-8 March Workshop**
- Illinois River (FWIC & RRAT)
  - 22 February Pre-workshop meeting
  - **9-10 April Workshop**

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SCHEDULE

- May 2024 Program Planning Team (UMRR CC, River Team Chairs, Program Manager, & District HREP Managers) Meeting – **Request for availability this week.**
- August 2024 Program Planning Team Meeting – Draft Fact Sheets for River Team (RRF, RRCT, & RRAT Exec)
- February 2025 UMRR CC – Presentation by River Teams
- May 2025 UMRR CC – Endorsement of Fact Sheets by UMRR CC

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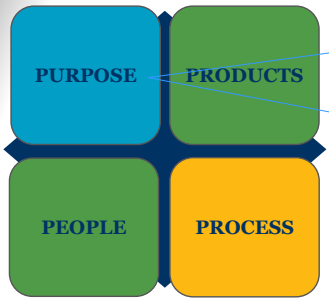
UMRR STRATEGIC PLANNING

22

UMRR STRATEGIC PLANNING

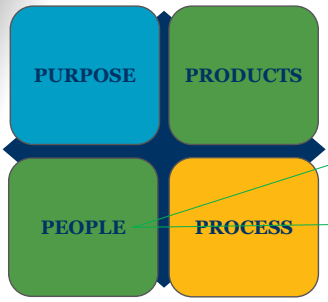


Support the strategic management of the UMRR Program

Enhance collaboration among the partnership

23

UMRR STRATEGIC PLANNING



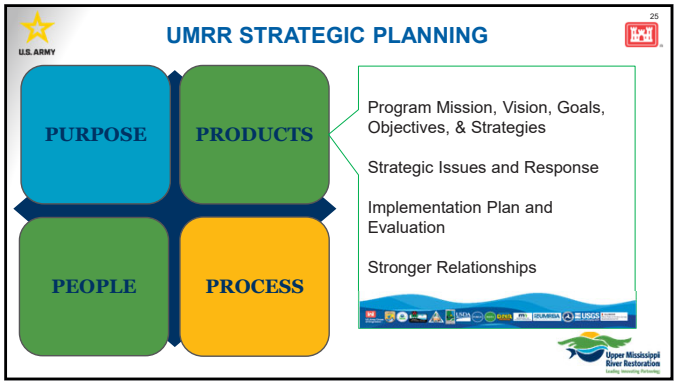
UMRR Coordinating Committee

Strategic Planning Team

Independent Facilitator

Stakeholders, individuals, and organizations

24



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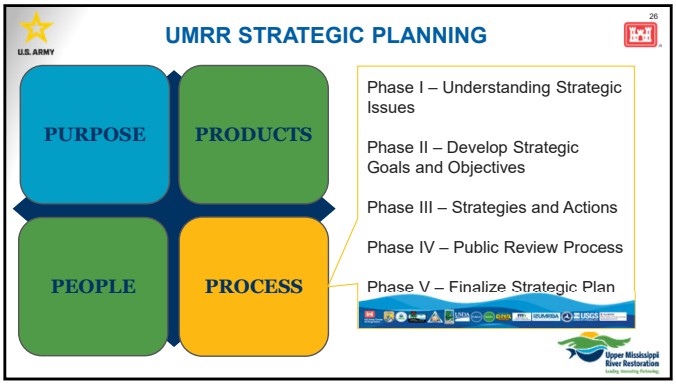

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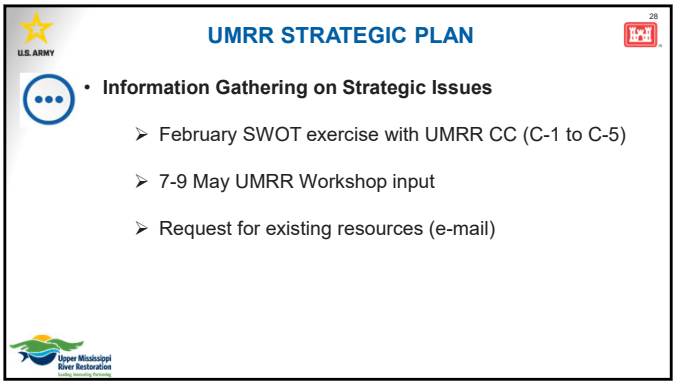

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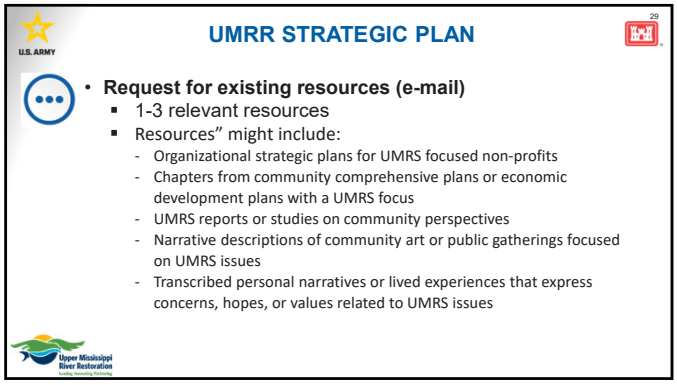

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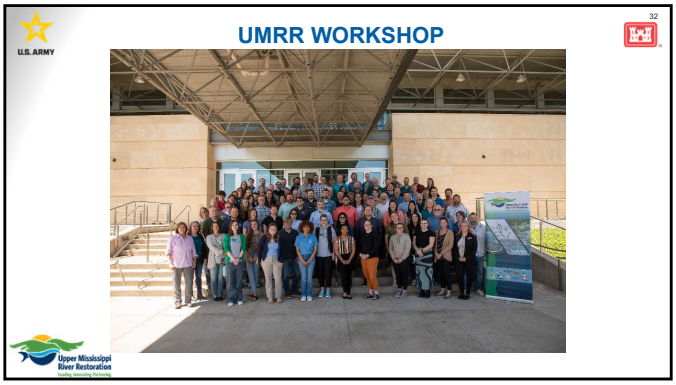

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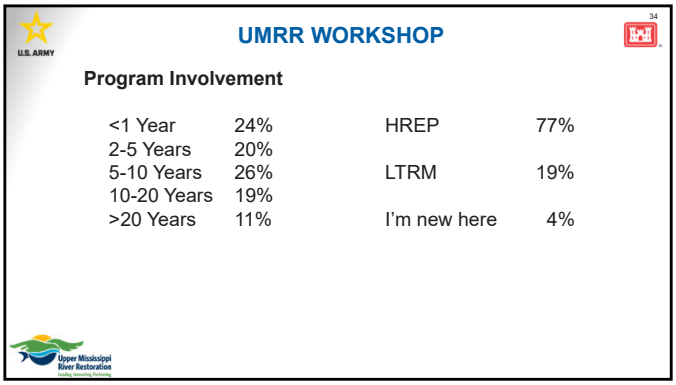

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UMRR WORKSHOP

- **UMRR Workshop Planning Group**

Agency	Staff
Iowa	Kirk Hansen & Ryan Hupfeld
Minnesota	Vanessa Perry & Nicole Ward
Missouri	Matt Vitello & Molly Sobotka
Wisconsin	Jeff Janvrin & Brenda Kelly
Illinois	Jim Lamer
U.S. F&WS	Sara Schmuecker & Sharonne Baylor
USGS	Jeff Houser & Jim Fisher
USACE	Kara Mitvalsky, Brain Markert, Lane Richter, Elisa Royce, Angela Deen, Kacie Grupa, Julie Millhollin, Davi Michl, Rachel Perrine, Marshall Plumley
UMRBA	Andrew Stephenson

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2022 REPORT TO CONGRESS

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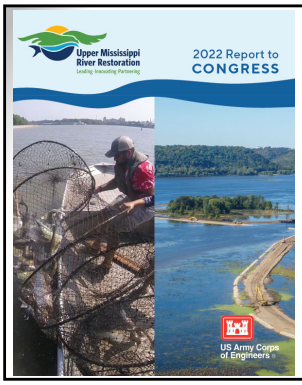

Leading

- Implemented the UMRR program as outlined in the adopted Joint Charter and the goals and objectives of the 2015-2025 Strategic Plan.
- Provided critical insight and understanding of the UMRS through monitoring, research, and modeling to inform management of the UMRS.
- Promoted a common vision, sense of purpose, transparency, and accountability among the program partners.

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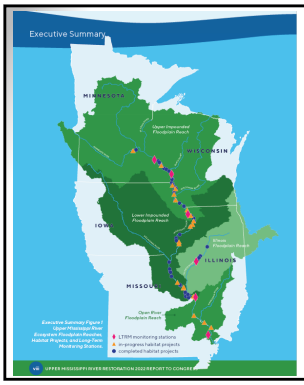

Innovating

- Assessed and detected changes in the fundamental health and resilience of the UMRS.
- Defined ecological resilience and appropriate indicators to measure status and trends in the UMRS.
- Renewed UMRR's Habitat Needs Assessment and identified the suite of habitat projects to improve UMRS ecosystem health and resilience.
- Addressed key ecological needs at various spatial scales.
- Formulated and constructed 7 habitat restoration projects benefiting approximately 15,400 acres of nationally significant aquatic, wetland, forest, island, side channel and backwater habitats.

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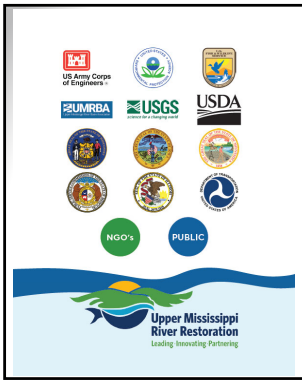

Partnering

- Actively exchanged information with UMRS watershed, national, and international partners.
- Evaluated and learned from constructed habitat restoration projects.
- Applied adaptive management principles to address risk and uncertainty.
- Collaborated with partners to further inform issues related to project partnership agreements.

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CONCLUSIONS AND RECOMENDATIONS

Recommendations in the 2022 RTC:

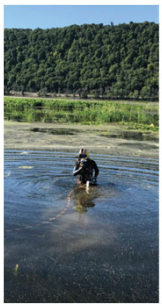
- Apply defined ecological resilience concepts.
- Apply the UMRR Habitat Needs Assessment II.
- Continue to identify and construct habitat projects that improve the Upper Mississippi River Systems ecosystem health and resilience.
- Evaluate and learn from constructed habitat projects to inform future restoration and management.
- Engage the partnership in 2024 in preparing the next UMRR Strategic Plan.

42

CONCLUSIONS AND RECOMENDATIONS

Recommendations in the 2022 RTC:

- Apply adaptive management principles to address risk and uncertainty.
- Assess, and detect changes in, the fundamental health and resilience of the Upper Mississippi River ecosystem by continuing to monitor and evaluate its key ecological components.
- Provide critical insights and understanding regarding a range of key ecological questions… in order to inform and improve management and restoration of the Upper Mississippi River ecosystem.



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CONCLUSIONS AND RECOMENDATIONS

Recommendations in the 2022 RTC:

- Work with key organizations and individuals in the Upper Mississippi River watershed.
- Provide information to organizations and individuals whose actions and decisions affect the Upper Mississippi River ecosystem.
- Promote a common vision and sense of purpose, transparency, and accountability among UMRR's implementing partner agencies.
- Implement UMRR as outlined in Joint Charter.
- The Corps and non-federal sponsors should continue to work together to further inform issues related to execution of PPA's.

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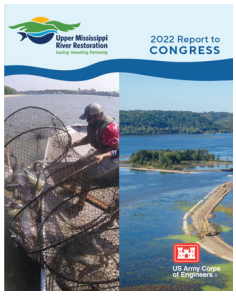
REPORT TO CONGRESS



Letters of Support

- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- U.S. Environmental Protection Agency
- Upper Mississippi River Basin Association
- Missouri Department of Conservation
- Iowa Department of Natural Resources
- Minnesota Department of Natural Resources
- Wisconsin Department of Natural Resources
- Illinois Department of Natural Resources
- The Nature Conservancy
- Audubon of Minnesota, Iowa & Missouri
- American Rivers
- Mississippi Interstate Cooperative Resource Association

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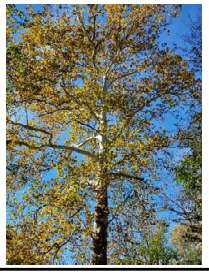
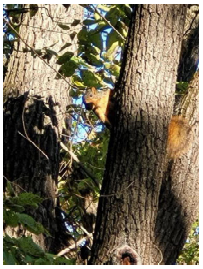
DISCUSSION





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UMRR Strategic Planning Process

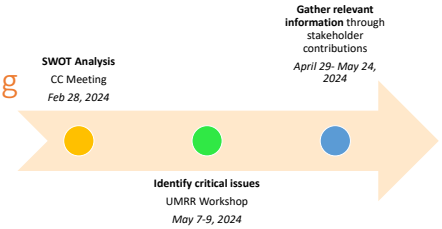
1

Communication plan goals/objectives

1. Gather data from stakeholders to inform the strategic plan
2. Gather feedback on draft goals and objectives from a wide variety of stakeholders
3. Gather feedback on the draft strategic plan from a wide variety of stakeholders

2

Phase 1: Understanding Strategic Issues



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Phase 1: Understanding Strategic Issues

THEMES

STRENGTHS	WEAKNESSES
Partnership Scale Long-term Consistently funded Programmatic approach	Resource constraints Communication challenges Lack of integration of 2 mission areas Organizational constraints
OPPORTUNITIES	**THREATS**
Better coordination with NESP Increased awareness of UMRR Connect to related efforts/priorities Community engagement Policies and priorities	Project cost Partner ability to support Funding Similar organizations Lacking relevancy Climate change Increased oversite, decreased efficiency Influences in surrounding watershed

4

Phase 1: Understanding Strategic Issues

UMRR Workshop Input

1. Discuss strengths/weaknesses of UMRR
2. Discuss opportunities and threats UMRR may face over the next 10 years
3. Discuss the most critical issues UMRR must address in the next 10 years
4. Choose 1 from your group to enter into PollEverywhere
5. Rank critical issues

5

UMRR Workshop Input

Strengths

STRENGTHS

Partnership
- Collaboration and partnership with agencies like USGS, Fish and wild life services, DNR's etc.

Scale
- Long term, spatially extensive monitoring, detailed biological monitoring of the UMRS. 6 study reaches spanning 1100 mi of Upper Miss and Il River. All data publicly available. Extensive analysis of this data has provided a diversity of insights into the structure and function of the UMRS that inform its restoration and management.

Long-term
- lessons from project implementation over 30 years

Consistently funded
- Consistent funding

Programmatic approach
- Blending of science and restoration; intentional pairing

6

UMRR Workshop Input

Weaknesses

WEAKNESSES

Resource constraints
- Staff turnover, loss of institutional knowledge

Communication challenges
- Data sharing across agencies with individual restrictions

Lack of integration of 2 mission areas
- Two elements were not always moving toward the same goals

Organizational constraints
- Aligning partner priorities

7

UMRR Workshop Input

Opportunities

OPPORTUNITIES

Better coordination with NESP
- Coordination/synergy with NESP and channel maintenance activities.

Increased awareness of UMRR
- Increasing interest in and awareness of the Mississippi and Illinois Rivers. Increasing press attention.

Connect to related efforts/priorities
- Interest in flood resilience planning (levee setbacks, wetland enhancements, etc)

Community engagement
- Community engagement throughout the watershed

Policies and priorities
- New Administrative priorities such as environmental justice, climate change.

8

UMRR Workshop Input

Threats

THREATS

Project cost
- Costs of Projects increasing at an alarming rate

Partner ability to support
- Hard for partners to expand capacity to keep up with expanding programs

Funding
- Continuing Resolution

Similar organizations
- Orgs with similar mission/geography

Lacking relevancy
- If we're not doing work that feels relevant to partners/congressional reps, they will not want to fund us

Climate change
- Climate change and not building resilient enough projects to withstand impacts.

Increased oversite, decreased efficiency
- We don't currently have oversight of HQ. They have not been involved in UMRR – delegated to MVD – but as projects increase in size, they may want to pay more attention to us. May create more challenges. Could impact some of our current efficiencies.

Influences in surrounding watershed
- UMRR's authority is bluff to bluff, so can't influence things outside that area of authority

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Phase 1: Understanding Strategic Issues

TOP CRITICAL ISSUES

1. **Capacity: partner staff, USACE staff, contractors.** to support the growing program in order to most effectively address environmental needs, maintain quality and retention
2. **Increasing resiliency of projects** to better combat climate change threats/ invasives/ watershed influences
3. **Data collection & analysis** prior to projects

10

Phase 1: Understanding Strategic Issues

RELEVANT INFORMATION

Potential Resources
- Organizational strategic plans for UMRS focused non-profits
- Chapters from community comprehensive plans or economic development plans with a UMRS focus
- UMRS reports or studies on community perspectives
- Narrative descriptions of community art or public gatherings focused on UMRS issues
- Transcribed personal narratives or lived experiences that express concerns, hopes, or values related to UMRS issues

Will be analyzed to identify themes

11

Discussion! In breakout groups, discuss how UMRR strengths could help address these 3 critical issues over the next 10 years

Group #1: Capacity: partner staff, USACE staff, contractors. to support the growing program in order to most effectively address environmental needs, maintain quality and retention

Group #2: Increasing resiliency of projects to better combat climate change threats/ invasives/ watershed influences

Group #3: Data collection & analysis prior to projects

STRENGTHS
Partnership
Scale
Long-term
Consistently funded
Programmatic approach

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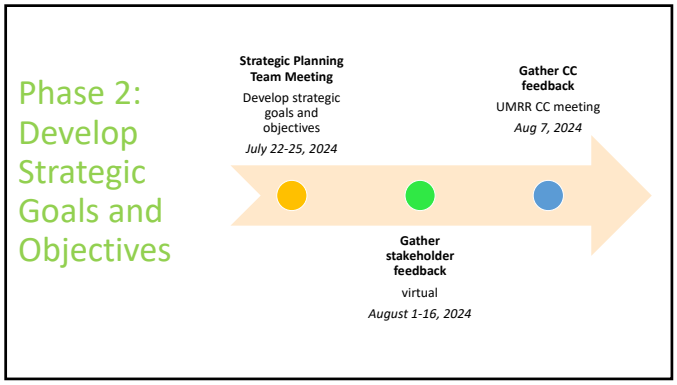

Phase 2: Develop Strategic Goals and Objectives
Strategic Planning Team Meeting
Develop strategic goals and objectives
July 22-25, 2024
Gather stakeholder feedback
virtual
August 1-16, 2024
Gather CC feedback
UMRR CC meeting
Aug 7, 2024

13

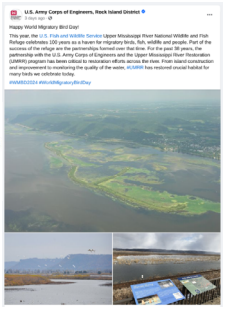
UMRR COMMUNICATION AND OUTREACH TEAM
Update

Rachel Perrine
- *Water Resource Planner*
- *Rock Island District Plan Formulation Section Chief*
- *UMRR Communication and Outreach Team Lead*

1

Where We've Been …

- Ongoing support for 2022 UMRR Report to Congress
- Inaugural UMRR photo contest planning
- World Migratory Bird Day social media post
- Initial discussions regarding potential updates to UMRR outreach materials, kiosks, and interpretive stations



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Where We're Going …

- Ongoing support for 2022 UMRR Report to Congress
- Potential updates to UMRR outreach materials, kiosks, and interpretive stations
- Social media engagements
- Synthesizing, discussing, and prioritizing input from the May 7-9 UMRR Workshop
- Inaugural UMRR Photo Contest!

3

UMRR COMMUNICATION AND OUTREACH TEAM – UMRR PHOTO CONTEST

"Empowering Conservation Through Vision: Capturing the Upper Mississippi River's Essence"

Who: UMRR partners
When: Photo submission period is August 1 – October 31, 2024; photos can be from any season or taken during prior years.
Why: To bolster UMRR's program materials and communication efforts.

Email announcement on August 1 will kick off the submission process

Categories:
- Before/After, Construction, or Benefits of HREPs (Before/After photos not subject to resolution restrictions)
- Connecting People with Nature, Human Use, or Public Interaction
- Natural Features, Scenic Views, or Landscapes
- Cultural or Historic Features
- LTRM – Monitoring in Action

4

UMRR COMMUNICATION AND OUTREACH TEAM – UMRR PHOTO CONTEST

"Empowering Conservation Through Vision: Capturing the Upper Mississippi River's Essence"

Prizes:
- Your contribution to:
  - bolstering the UMRR program's materials and communication efforts
  - amplified awareness and fostered appreciation for this vital ecosystem restoration and monitoring program
  - Celebration of the Upper Mississippi and Illinois Rivers through the lens of your creativity
- *Potentially* UMRR gear and/or framed photo
- "Our Mississippi" highlight in Spring 2025

5

6


7
UMRR Communication and Outreach Team
Points of Contact:
Rachel Perrine
USACE-RPEDN-PD-F @ MVR
Rachel.E.Perrine@usace.army.mil
Anne Wurtenberger
USACE-RPEDN-PD-F @ MVR
Anne.C.Wurtenberger@usace.army.mil
Upper Mississippi River Restoration

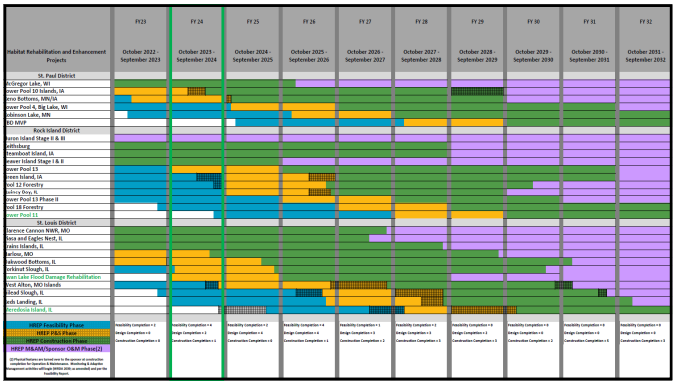
7

U.S. ARMY

HABITAT RESTORATION - DISTRICT REPORTS

Upper Mississippi River Restoration

1



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U.S. ARMY

ST. PAUL DISTRICT PROJECT UPDATE

Upper Mississippi River Restoration

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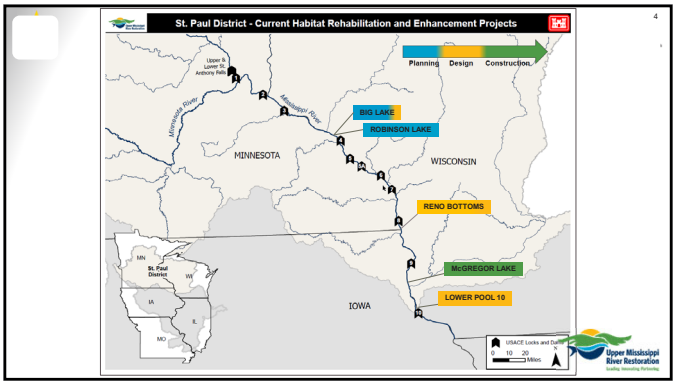

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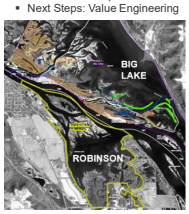
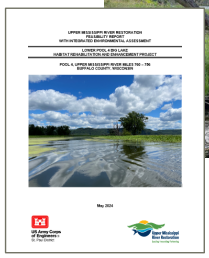
U.S. ARMY

PLANNING

- **Robinson Lake – Pool 4, MN**
  - Final array of alternatives
  - Quantities, cost, HEP underway
- **Big Lake – Pool 4, WI**
  - Submitted Final Report to MVD
  - UMRR Workshop Panel
  - Next Steps: Value Engineering





Big Lake – Catfish Slough

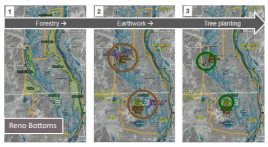
Upper Mississippi River Restoration

5

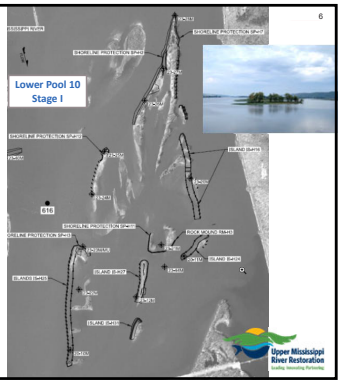
U.S. ARMY

DESIGN

- **Reno Bottoms HREP – Pool 9, MN/IA**
  - A/E Design of Stage 2
  - Preparing for 65% Review
  - June Site Visit with A/E and Partners



- **Lower Pool 10 HREP – Pool 10, IA**
  - A/E Design of Stages 1-3
  - Stage 1 – BCOES backcheck & closeout
    - ✓ May-June: Advertise
    - ✓ Aug-Sept: Award
  - Stages 2 & 3 – in review
  - June Site Visit with A/E and Partners

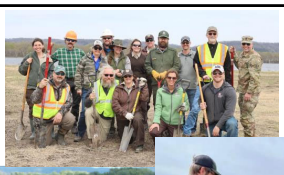


Upper Mississippi River Restoration

6

CONSTRUCTION

- **McGregor Lake HREP – Pool 10, WI**
  - Earth Day Tree Planting
  - Public Open House, Prairie du Chien
  - Stage I: 100% Complete
  - Stage II: 60% Complete
    - Completing fines placement & berm mixing
    - Final grading & seeding 2025

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ROCK ISLAND DISTRICT PROJECT UPDATE

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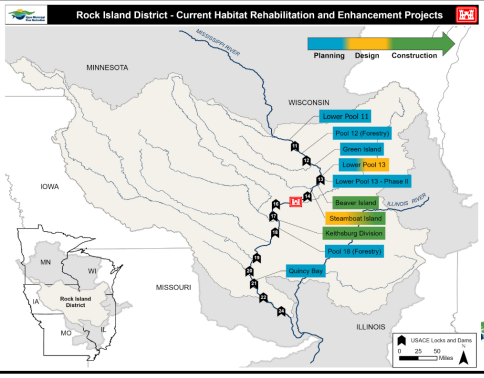

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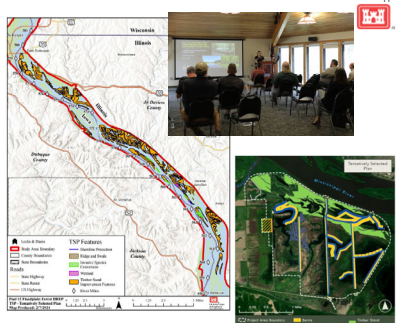
PLANNING

- **Pool 12 Forestry – Pool 12, IA/IL/WI**
  - PDT completed the DQC on the draft report
  - Public meeting held May 1st
  - ATR started on April 25
  - Next step: MVD policy and legal review
- **Green Island – Pool 13, IA**
  - PDT is finishing final DQC review
  - Next step: Final ATR review
- **Lower Pool 13 – Pool 13, IA/IL**
  - MOA was signed on February 29th
  - Next step: Design of Stage I



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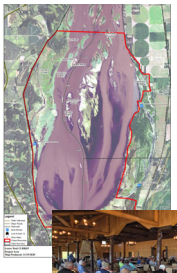
PLANNING

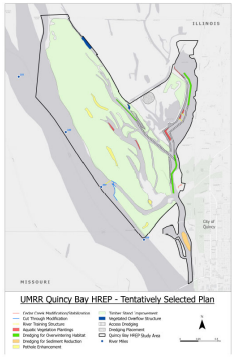
- **Lower Pool 13 Phase II – Pool 13, IA/IL**
  - Public scoping meeting held on April 30th
  - Next step: PDT working on writing the report and finalizing the alternatives
- **Pool 18 Forestry – Pool 18, IA**
  - Finalized measures
  - Next step: Start alternative formulation



12

PLANNING

- **Quincy Bay – Pool 21, IL**
  - Completed ATR, Public and MVD Policy and Legal reviews
  - PDT finishing the final DQC review
  - Next step: Final ATR review



UMRR Quincy Bay HREP - Tentatively Selected Plan

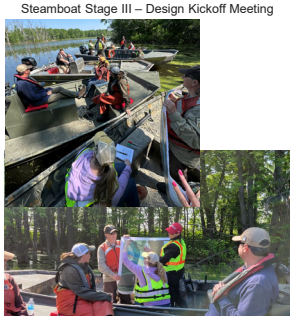
13

13

DESIGN

- **Steamboat Island Stage II – Pool 14, IA/IL**
  - Awarded contract March 3rd
  - Next step: Construction
- **Steamboat Island Stage III – Pool 14, IA/IL**
  - Design kickoff meeting held on May 15th.
  - Next step: 35% design
- **Lower Pool 13 Stage I – Pool 13, IA/IL**
  - VE scan completed on May 14th
  - Design kickoff meeting is scheduled for May 30th
  - Next step: 35% design

Steamboat Stage III – Design Kickoff Meeting



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CONSTRUCTION

- **Beaver Island Stage IB, Pool 14, IA/IL**
  - Construction is working on closing out the contract
  - Ribbon cutting ceremony being planned for late summer
- **Steamboat Island Stage I – Pool 14, IA/IL**
  - Contractor has completed all riprap placement
  - Engineering is reviewing the final survey
- **Steamboat Island Stage II, Pool 14, IA/IL**
  - Contractor is dredging and placing material
  - Protest – on-going

Steamboat Stage I Photo – Head of the Island and Bankline

Steamboat Stage II Photo – Dredging and placing material

15

15

CONSTRUCTION

- **Keithsburg Division Stage I, Pool 18, IL**
  - Contractor is on-site placing washed stone on the ACM
- **Keithsburg Division Stage II, Pool 18, IL**
  - Contractor is not onsite
- **Huron Island, Stage III - ERDC, Pool 18, IA**
  - Spring growth assessment is scheduled for June 4th
  - Supplemental plantings is scheduled for the week of July 15th
  - Survival survey is scheduled for September 17th

Keithsburg Division Stage I – Placing washed stone on the ACM

16

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OTHER ACTIVITIES

- **Forestry Multiple Award Task Order Contract (MATOC)**
  - FY24 SOW:
    - Steamboat
    - Lower Pool 13
    - Spring Lake
- **PER Site Visits**
  - Scheduling the following site visit this FY:
    - Rice Lake – June 7th
    - Princeton – June 28th
    - Pool 11 Islands – July 11th
    - Lake Odessa – Aug 15th

17

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ST. LOUIS DISTRICT PROJECT UPDATE

18

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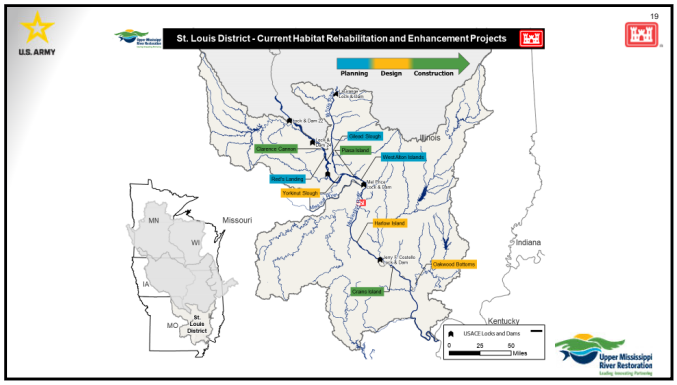

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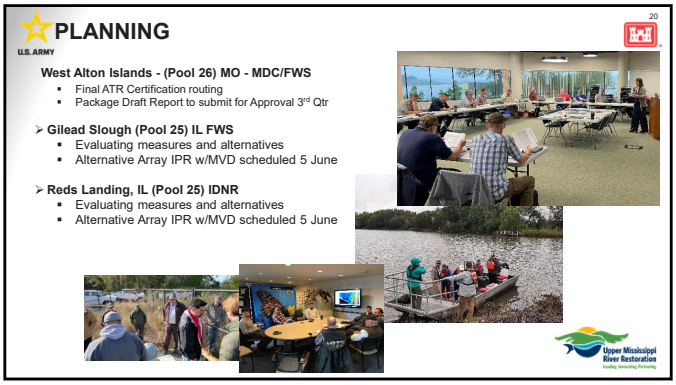

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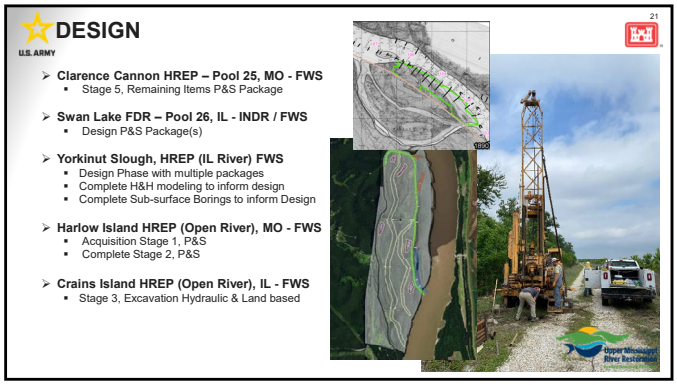

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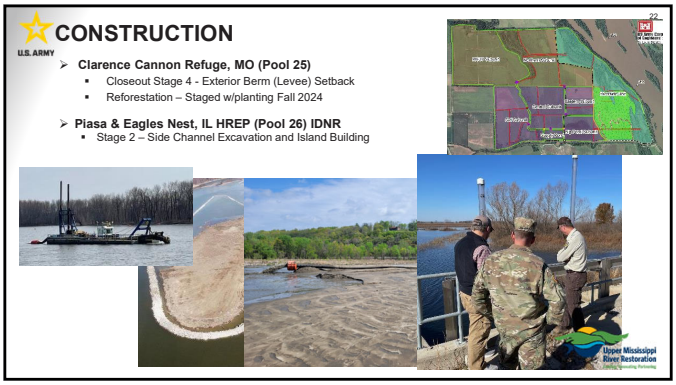

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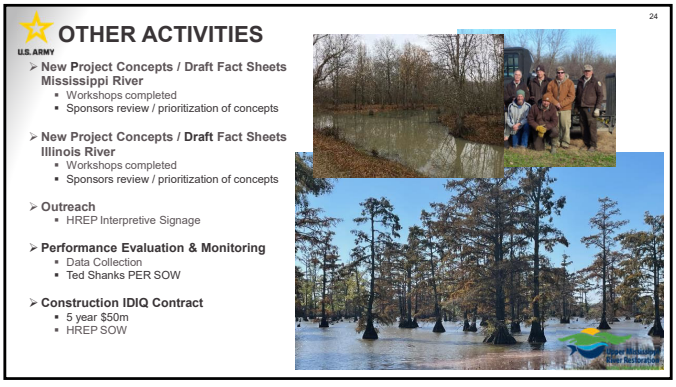
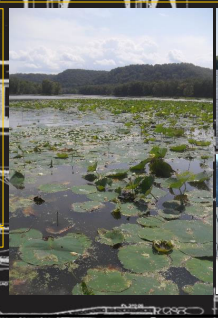


24

UMRR-LTRM MONITORING AND SCIENCE UPDATE

Davi Michl
Rock Island District
UMRR CC
22 May 2024



US Army Corps of Engineers

1

UMRR MONITORING & SCIENCE FY24

$55 Million UMRR Program

2 SOWs in FY24

SOW for LTRM base monitoring
$5.5M

SOW for science in support (analysis under base)
$1.5M

Both SOWs <u>together</u> are equivalent to a fully funded UMRR LTRM element $7.0M

Science in Support of Restoration & Management
(combined with analysis under base into 1 SOW)
$6.85M

TOTAL: $13.85M

2

UMRR MONITORING & SCIENCE FY24

LTRM

	Budget (gross)
MN	$960,408
WI	$808,323
IA	$553,442
Great Rivers (IL)	$576,343
Big Rivers & Wetlands (MO)	$616,632
IRBS (IL)	$634,892
Equipment	$225,840
Science meeting	$ 10,483
STATES TOTAL (-carry-in)	**$4,160,377***
UMESC TOTAL (-carry-in)	**$3,545,194**
Corps tech/science reps	$ 77,000
TOTAL FY24 LTRM BUDGET	**$7,782,571**

3

UMRR MONITORING & SCIENCE FY24

Science in Support of Restoration and Management

A. LTRM balance	$ 782,571
B. River Gradients – IRBS	$ 5,052
C. Macroinvertebrates	$ 199,982
D. Resilience FY25-27	$ 907,731
E. Chloride Monitoring FY24-25	$ 93,456
F. Landscape Patterns	$ 428,911
G. Topobathy UMESC support	$ 200,419
H. Implementation Planning INs	$ 2,009,024
I. Science Proposals	$ 1,990,400
Subtotal	**$ 6,617,546***
Remaining	**$ 230,000***

4

FY24 SCIENCE PROPOSALS

Understanding, quantifying and forecasting associations among hydrogeomorphology, water chemistry, and the distribution and abundance of biota in the upper Mississippi river under climate change	Kaemingk, Hampton, De Jager, Chick, De Boer	$247,403
Generating future hydrology and water temperature projections for the UMRS using hybrid deep learning (Funding for FY2025 only)	Delaney, Trumper, Sawyer	$221,510
Submersed plant responses to physical forces of wind, waves, velocity, and shear stress	D. Larson, Hanson	$267,822
In-depth characterization of phytoplankton communities and toxicity across connectivity gradients along 450 miles of the Upper Mississippi River System	Loken, Kreiling, Jankowski, J. Larson	$236,310

5

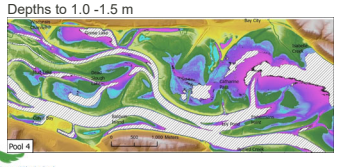
FY24 SCIENCE PROPOSALS – CONT

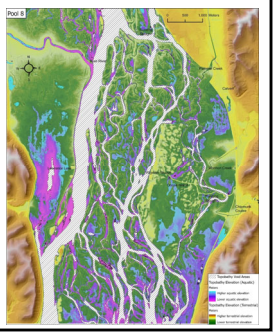
Hindcasting and forecasting abiotic drivers of UMRS fish populations and advancing management and research tools for non-game fishes	Ickes, J. Lamer	$258,126
Using sUAS to monitor and survey regeneration and recruitment in areas of forest canopy loss	Strassman, Guyon	$307,035
Understanding the role of surface-subsurface hydrology and soil characteristics on floodplain vegetation in the Upper Mississippi River System through space and time	Windmuller-Campione, Guyon, Arenas, Van Appledorn	$386,194
Strategic approach to identify HREP features that promote dense and diverse mussel assemblages	Bouska, Newton	$66,000
	Total	**$1,990,400**

6

TOPOBATHY UPDATES

- FY23 Pilot Study (Pools 4 & 8)
  - Bathymetric LiDAR acquisition – Nov 2023
  - Hydrosurvey acquisition – 8 Apr 2024, ongoing
- Deliverables to date:
  - Classified point clouds
  - Images are derived DEMs with 0.5m resolution
  - Depths to 1.0 -1.5 m





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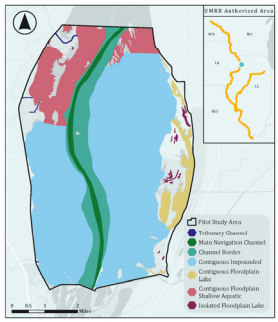
TOPOBATHY UPDATES

- Proposed FY24 Topobathy Acquisition
  - Lower Pool 13 pilot study expansion
    - Support Lower Pool 13 HREP/HARP
    - Use best-of-FY23 Pilot sensors
    - Test additional sensor capabilities/efficiencies



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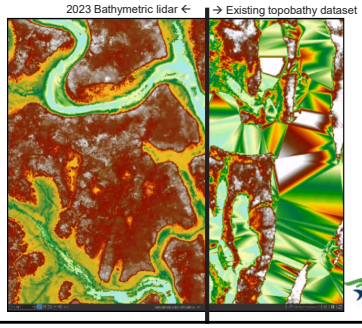
TOPOBATHY UPDATES

- Proposed FY24 Topobathy Acquisition
  - Systemic Topobathy Acquisition
    - Open River
    - Pool 26
    - Pool 25
    - Pool 24

9

QUESTIONS?



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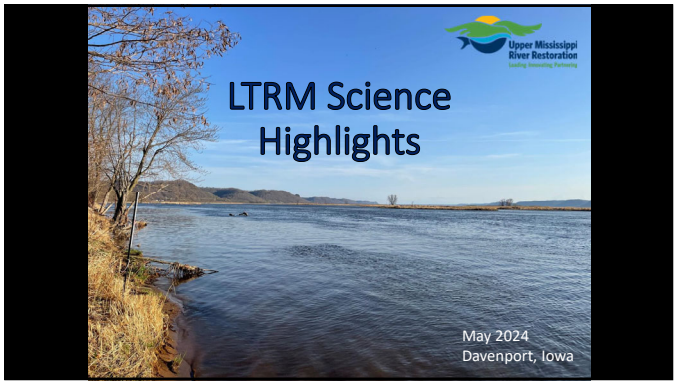
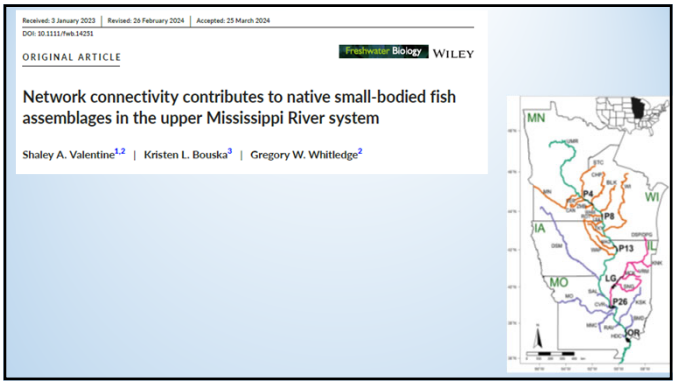

Upper Mississippi River Restoration
LTRM Science Highlights
May 2024
Davenport, Iowa

1


Received: 3 January 2023 | Revised: 26 February 2024 | Accepted: 25 March 2024
DOI: 10.1111/fwb.14251
ORIGINAL ARTICLE
Freshwater Biology WILEY
Network connectivity contributes to native small-bodied fish assemblages in the upper Mississippi River system
Shaley A. Valentine[1,2] | Kristen L. Bouska[3] | Gregory W. Whitledge[2]
MN
WI
IA
MO
P4
P8
P13
LG
P26
OR

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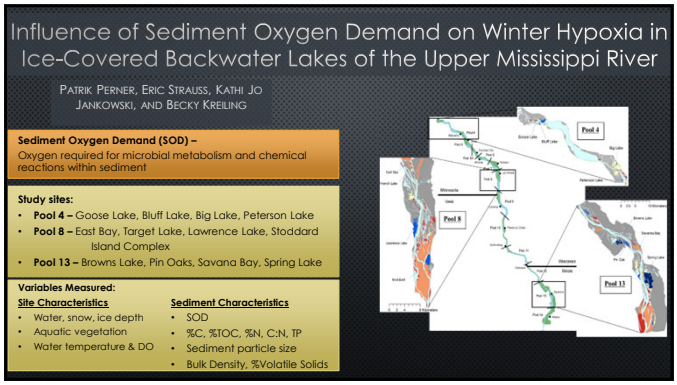
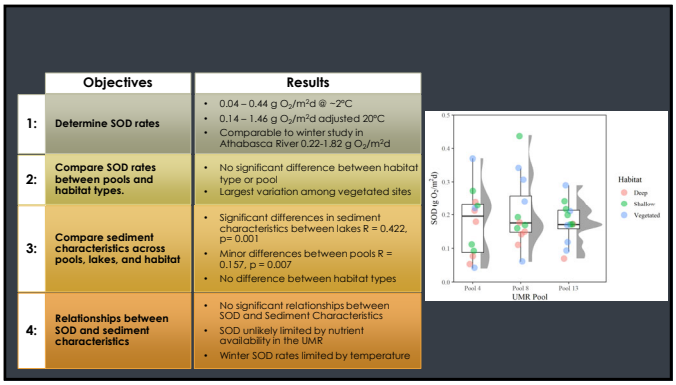
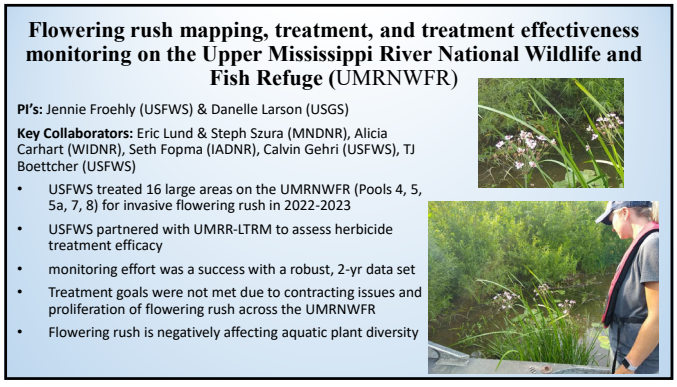

Influence of Sediment Oxygen Demand on Winter Hypoxia in Ice-Covered Backwater Lakes of the Upper Mississippi River
Patrik Perner, Eric Strauss, Kathi Jo Jankowski, and Becky Kreiling
Sediment Oxygen Demand (SOD) –
Oxygen required for microbial metabolism and chemical reactions within sediment
Study sites:
Pool 4 – Goose Lake, Bluff Lake, Big Lake, Peterson Lake
Pool 8 – East Bay, Target Lake, Lawrence Lake, Stoddard Island Complex
Pool 13 – Browns Lake, Pin Oaks, Savana Bay, Spring Lake
Variables Measured:
Site Characteristics
Water, snow, ice depth
Aquatic vegetation
Water temperature & DO
Sediment Characteristics
SOD
%C, %TOC, %N, C:N, TP
Sediment particle size
Bulk Density, %Volatile Solids
Pool 4
Pool 8
Pool 13

3


Objectives
Results
1: Determine SOD rates
0.04 – 0.44 g O2/m2d @ ~2°C
0.14 – 1.46 g O2/m2d adjusted 20°C
Comparable to winter study in Athabasca River 0.22-1.82 g O2/m2d
2: Compare SOD rates between pools and habitat types.
No significant difference between habitat type or pool
Largest variation among vegetated sites
3: Compare sediment characteristics across pools, lakes, and habitat
Significant differences in sediment characteristics between lakes R = 0.422, p= 0.001
Minor differences between pools R = 0.157, p = 0.007
No difference between habitat types
4: Relationships between SOD and sediment characteristics
No significant relationships between SOD and Sediment Characteristics
SOD unlikely limited by nutrient availability in the UMR
Winter SOD rates limited by temperature
Habitat
Deep
Shallow
Vegetated
Pool 4
Pool 8
Pool 13
UMR Pool

4


Flowering rush mapping, treatment, and treatment effectiveness monitoring on the Upper Mississippi River National Wildlife and Fish Refuge (UMRNWFR)
PI's: Jennie Froehly (USFWS) & Danelle Larson (USGS)
Key Collaborators: Eric Lund & Steph Szura (MNDNR), Alicia Carhart (WIDNR), Seth Fopma (IADNR), Calvin Gehri (USFWS), TJ Boettcher (USFWS)
USFWS treated 16 large areas on the UMRNWFR (Pools 4, 5, 5a, 7, 8) for invasive flowering rush in 2022-2023
USFWS partnered with UMRR-LTRM to assess herbicide treatment efficacy
monitoring effort was a success with a robust, 2-yr data set
Treatment goals were not met due to contracting issues and proliferation of flowering rush across the UMRNWFR
Flowering rush is negatively affecting aquatic plant diversity

5

LTRM Implementation Planning

6

LTRM Implementation Planning

- Kirk Hansen IADNR
- Jim Lamer IRBS
- Molly Sobotka MDC
- Matt Vitello MDC
- Rob Burdis MDNR
- Nick Schlesser MDNR
- Neil Rude MDNR
- Andrew Stephenson UMRBA
- Davi Michl USACE
- Rob Cosgriff USACE

Facilitators:
David Smith (USGS, retired)
Max Post van der Burg (USGS)

- Karen Hagerty USACE (retired)
- Matt Mangan USFWS
- Steve Winter USFWS
- Kristen Bouska USGS
- Nate De Jager USGS
- Jeff Houser USGS
- Jennie Sauer USGS (retired)
- Robb Jacobson USGS
- Jim Fischer WDNR
- Madeline Magee WDNR

Additional expertise:
Danelle Larson (USGS)
Teresa Newton (USGS)

7

LTRM Implementation Planning Recommended Information Needs

- Geomorphic trends in the UMRS
- River gradients from Pool 14 to Pool 25
- Floodplain vegetation change across system
- Lower trophic contribution (zooplankton and phytoplankton
- Terrestrial and aquatic herpetofauna (amphibians and reptiles)
- Aquatic plant distribution
- Freshwater mussels
- Learning from HREPs
- Macroinvertebrates*

8

LTRM Implementation Planning Recommended Information Needs

- Geomorphic trends in the UMRS
- River gradients from Pool 14 to Pool 25

FY2023

- Floodplain vegetation change across system
- Lower trophic contribution (zooplankton and phytoplankton
- Terrestrial and aquatic herpetofauna (amphibians and reptiles)
- Aquatic plant distribution
- Freshwater mussels
- Learning from HREPs
- Macroinvertebrates*

9

LTRM Implementation Planning Recommended Information Needs

- Geomorphic trends in the UMRS
- River gradients from Pool 14 to Pool 25

FY2023

- Floodplain vegetation change across system
- Lower trophic contribution (zooplankton and phytoplankton

FY2024 recommendation

- Terrestrial and aquatic herpetofauna (amphibians and reptiles)
- Aquatic plant distribution
- Freshwater mussels
- Learning from HREPs
- Macroinvertebrates*

10

Floodplain vegetation change across the system

- **Goal**: A quantitative understanding of how the vegetation of the entire UMRS has changed since historical conditions (pre-lock and dam) as well as over the past 30 to 40 years.
- **Approach**: Use existing data sets and tools to better understand and quantify long-term changes in plant communities, especially floodplain forest.
- **How results will be used**: Understanding how and why the floodplain vegetation communities have changed can identify effective management and restoration actions to sustain floodplain ecosystems of the UMRS

11

Aquatic ecology: Lower trophic contribution (phytoplankton and zooplankton)

- **Goal**: Establish baseline conditions in the UMRS and investigate relationships between plankton and environmental conditions. That is, what are the abundance, distribution, and status of phytoplankton and zooplankton in the UMRS?

- **How the results will be used**:
  - Indicators of the health and resilience of the UMRR
  - Assessing ecological response to ongoing environmental changes

12

LTRM Implementation Planning Recommended Information Needs

- Geomorphic trends in the UMRS
- River gradients from Pool 14 to Pool 25

FY2023

- Floodplain vegetation change across system
- Lower trophic contribution (zooplankton and phytoplankton

FY2024 recommendation

- Terrestrial and aquatic herpetofauna (amphibians and reptiles)
- Aquatic plant distribution
- Freshwater mussels
- Learning from HREPs
- Macroinvertebrates*

13

2024 UMRR Science Proposals

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2024 UMRR Science Meeting Working Groups

- WG1: Modeling physical and biological components of the UMRS under different environmental and management actions
- WG2: Effects of aquatic vegetation on:
  - Nutrient and carbon retention, processing and export;
  - Sediment retention and hydrogeomorphology
  - Oxygen dynamics and ecosystem metabolism
- WG3: Quantifying spatial and temporal patterns in temperature in the UMRS and implications for biota [*joint mtg of WG1 and WG2*]
- WG4: Fisheries: Enhanced understanding of UMRS upper aquatic trophics
- WG5: Floodplain ecology
- WG6: Linking restoration actions and ecological responses

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Proposal Title	Recommendation
Using sUAS to monitor and survey regeneration and recruitment in areas of forest canopy loss	Fund FY24
Hindcasting and forecasting abiotic drivers of UMRS fish populations and advancing management and research tools for non-game fishes	Fund FY24
Strategic approach to identify HREP features that promote dense and diverse mussel assemblages	Fund FY24
Understanding the role of surface-subsurface hydrology and soil characteristics on floodplain vegetation in the Upper Mississippi River System through space and time	Fund FY24
Submersed plant responses to physical forces of wind, waves, velocity, and shear stress	Fund FY24
Understanding, quantifying and forecasting associations among hydrogeomorphology, water chemistry, and the distribution and abundance of biota in the upper Mississippi river under climate change	Fund FY24
Understanding ice cover and its effects on habitat conditions along the Upper Mississippi River via satellite imagery, trail cameras, and deep learning	Priority for FY25
Generating future hydrology and water temperature projections for the UMRS using hybrid deep learning	One year of funding in FY24; remainder a priority in FY25
In-depth characterization of phytoplankton communities and toxicity across connectivity gradients along 450 miles of the Upper Mississippi River System	Fund FY24
Quantifying available energy for foraging waterfowl provided by several aquatic and floodplain plant communities over 4 decades	Reconsider in FY25
Side channel connectivity and physical habitats at UMRR rehabilitation project sites	Reconsider in FY25
Harmonization and spatial mapping of temperature across all LTRM reaches and DO in Pool 8	Reconsider in FY25
How does restoration affect the carbon cycle? Exploring carbon cycling along environmental gradients in the UMRS	Reconsider in FY25

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Recommended for funding during FY2024 (E-23)

- Associations among hydrogeomorphology, water chemistry, and the distribution and abundance of biota in the upper Mississippi river under climate change
- Generating future hydrology and water temperature projections for the UMRS using hybrid deep learning (*Funding for FY2025 only*)
- Submersed plant responses to wind, waves, water velocity, and shear stress
- In-depth characterization of phytoplankton communities and toxicity across connectivity gradients along 450 miles of the Upper Mississippi River System
- Hindcasting and forecasting abiotic drivers of UMRS fish populations and advancing management and research tools for non-game fishes
- Using sUAS to monitor and survey regeneration and recruitment in areas of forest canopy loss
- Understanding the role of surface-subsurface hydrology and soil characteristics on floodplain vegetation in the UMRS through space and time
- Strategic approach to identify HREP features that promote dense and diverse mussel assemblages

17

Understanding, quantifying and forecasting associations among hydrogeomorphology, water chemistry, and the distribution and abundance of biota in the upper Mississippi river under climate change

Principal Investigators:

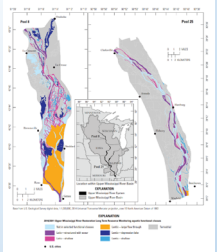
Mark A. Kaemingk and Julia Hampton, University of North Dakota

Nathan R. De Jager, USGS

John C. Chick, Great Rivers Field Station, Illinois Natural History Survey, Prairie Research Institute, University of Urbana-Champaign, chick@illinois.edu

Jason A. DeBoer, Illinois River Biological Station, Illinois Natural History Survey, Prairie Research Institute, University of Urbana-Champaign,

Collaborators:
Kathi Jo Jankowski, Brian Ickes, Teresa Newton, Danelle Larson, USGS-UMESC



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Understanding, quantifying and forecasting associations among hydrogeomorphology, water chemistry, and the distribution and abundance of biota in the upper Mississippi river under climate change

Primary goals:

1) Develop a quantitative understanding of how **water quality attributes, aquatic vegetation, mussel, and fish communities** are structured spatially and temporally across the UMRS and over time;

2) Quantify associations with mappable, landscape-scale physical attributes (i.e., aquatic areas).

Secondary goal:

Use the above information, along with outputs from Delaney et al. (future predictions of river discharge under climate change) to make informed predictions about the likely future distribution and abundance of aquatic areas and associated water quality and biotic community distributions.

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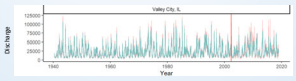
Generating future hydrology and water temperature projections for the UMRS using hybrid deep learning (*initial year of funding*)

(John Delaney [USGS]; Matthew Trumper [USGS])



- Objective:
  - Use AI/ML and hybrid modeling techniques to predict discharge and water surface elevation (WSE) for USGS gage locations and USACE points of interest throughout the UMRS over the observed record.
  - Develop a database of historic and contemporary water temperature that approximates the extent and resolution of the existing WSE database through collaboration between the USGS and USACE.

20

Generating future hydrology and water temperature projections for the UMRS using hybrid deep learning (FY2025 only)

(John Delaney [USGS]; Matthew Trumper [USGS])

- Approach
  - Train model using observed discharge/WSE, air temperature, and precipitation;
  - identify key processes to include in the model;
  - evaluate performance on observed record and on extreme (air temp. and precip.) years.
  - Compile water temperature records;
  - update web application developed for WSE to include water temperature;
  - implement semi-automated scripted process to keep database current; perform historical trends analysis.
- Outcome
  - A deep learning model that accurately replicates observed discharge and WSE that could be applied to downscaled climate model outputs in the future.
  - A water temperature database that could be integrated into the deep learning model in the future and an analysis of historical trends.

21

Submersed plant responses to physical forces of wind, waves, velocity, and shear stress

PI's: Danelle Larson & Jenny Hanson (USGS)

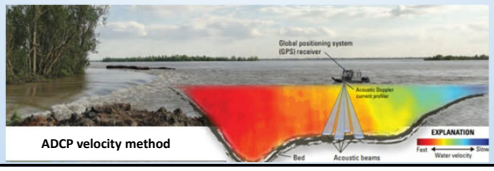
Key Collaborators: Angus Vaughan, Jason Rohweder, Colleen Anderson, Julia Cogan, John Delaney, & Kristen Bouska (USGS), Nicole Manesco (USACE), Eric Lund & Steph Szura (MNDNR), Alicia Carhart (WIDNR), Seth Fopma (IADNR)

We do not currently have quantitative understanding of how physical forces like velocity, wind, waves, and shear stress affect SAV (esp. wild celery) abundance and resilience.

22

Submersed plant responses to physical forces of wind, waves, velocity, and shear stress

1. Main objectives: (1) identify responses of SAV to wind, waves, velocity, and shear stress; (2) Better understand how manipulating these drivers can restore submersed plants like wild celery
2. Basic approaches: (1) update wind and wave models; (2) collect velocity data using ACDP technology, interpolation, and HEC-RAS models, and then compare velocity methods; (4) sample plants and habitats; (5) use community analyses for relationships of plants and physical forces.
3. Main expected outcomes: (1) new spatial data for wind, waves, and velocity and understanding of their effects on SAV



ADCP velocity method

23

In-depth characterization of phytoplankton communities and toxicity across connectivity gradients along 450 miles of the Upper Mississippi River System

(Kathi Jo Jankowski, James Larson, Becky Kreiling, and Kenna Gierke; Luke Loken, Sophia Lafond-Hudson, Carrie Givens, Hayley Olds, and Leon Katona)

- Objectives and Outcomes
  - **Objective 1**: Determine phytoplankton community composition and toxin-production potential in under-sampled areas of the river
  - **Outcome**: Understand toxin-production potential of phytoplankton communities across important environmental gradients in the UMR
  - **Objective 2**: Determine utility of data generated from multiple methods of phytoplankton characterization (chlorophyll, microscopy, qPCR, FlowCam, and cyanotoxin analysis)
  - **Outcome**: Inform future decisions on design and analysis for characterizing UMRS phytoplankton communities

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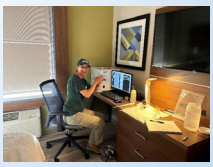
In-depth characterization of phytoplankton communities and toxicity across connectivity gradients along 450 miles of the Upper Mississippi River System

(Kathi Jo Jankowski, James Larson, Becky Kreiling, and Kenna Gierke [USGS-UMESC]; Luke Loken, Sophia Lafond-Hudson, Carrie Givens, Hayley Olds, and Leon Katona [USGS-UMidWSC])

- Approach:
  - Add-on to previously funded UMRR proposal being conducted during Summer 2024
  - During 2-week longitudinal survey in August 2024, collect samples across connectivity gradients in Pools 10, 13, and 18-21 and in main channel locations in Pools 10-26 (~76 samples total)
  - Analyze samples for chlorophyll-a, microscopy, FlowCam, qPCR (toxin production potential), SPATT samplers (toxins), and ELISA (toxins)



25

Hindcasting and forecasting abiotic drivers of UMRS fish populations and advancing management and research tools for non-game fishes

(Brian S. Ickes [USGS/LTRM]; James Lamer [INHS])

- Objectives:
  - Model past population dynamics for a select set of fish species with the benefit of a new historic abiotic drivers database, vital rates data, and past LTRM observations
  - Identify and evaluate likely drivers of population dynamics in the future
  - Develop tools for managers to consider nongame species in their management plans using novel data visualization techniques

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Hindcasting and forecasting abiotic drivers of UMRS fish populations and advancing management and research tools for non-game fishes

(Brian S. Ickes [USGS/LTRM]; James Lamer [INHS])

- Approach
  - Auto-regressive time series models for hindcasting objectives
  - Evaluate prospective forecasting modeling approaches (Markov chain, ARIMA, Machine learning approaches)
  - R-Shiny app will be developed for nongame species to plot occurrence, habitat selection attributes, population demographics, and species co-occurrences.
  - Additionally, a GAP analysis will be performed to identify poorly known or unknown life history attributes for this class of species to prioritize work in out-years.

27

Using sUAS to monitor and survey regeneration and recruitment in areas of forest canopy loss

(Andrew Strassman [USGS]; Dr. Lyle Guyon [NGRREC])

- Objective: Address three main topics
  - Are floodplain forests that recently experienced heavy canopy mortality regenerating?
  - What successional pathways are regenerating forests following?
  - Can sUAS supplement or supplant on-the-ground vegetation data collection?

Standing dead floodplain forest, upper Pool 13

28

Using sUAS to monitor and survey regeneration and recruitment in areas of forest canopy loss

(Andrew Strassman [USGS]; Dr. Lyle Guyon [NGRREC])

- Proposed Approach:
  - Collect imagery with UAS, and ground data with field crews
  - Map evidence of forest regeneration in UAS imagery
  - Assess field data for evidence of forest regeneration
  - Compare different forest regeneration assessments and relative accuracy and efficiency of each method
  - Compile and compare respective costs of each method
  - Analyze regeneration data for trends supporting and inhibiting floodplain forest regeneration
  - Report on floodplain forest regeneration metrics and on the different assessment methods

Wingtra One Gen II training flight with USGS UMESC and Necedah NWR Staff

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Using sUAS to monitor and survey regeneration and recruitment in areas of forest canopy loss

(Andrew Strassman [USGS]; Dr. Lyle Guyon [NGRREC])

- Expected Outcomes:
  - High resolution imagery of forest loss areas
  - Characteristics that distinguish areas with and without floodplain forest regeneration
  - Data on the efficiency and cost effectiveness of each collection method
  - USGS publication detailing project

Regenerating floodplain forest in upper Pool 02

30

Understanding the role of surface-subsurface hydrology and soil characteristics on floodplain vegetation in the Upper Mississippi River System through space and time

Marcella Windmuller-Campione [U. of MN]; Lyle Guyon [NGRREC], Antonio Arenas [Iowa St Univ.], Molly Van Appledorn [USGS])

- Objective:
  - Primary: Describe the linkages among surface-subsurface hydrology, hydrogeomorphic features, soils, and floodplain vegetation dynamics.
  - Secondary: assess the ability of the UMRS Floodplain Inundation Model to estimate groundwater dynamics.

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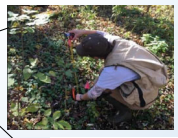
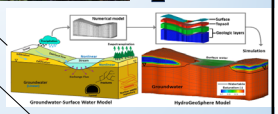
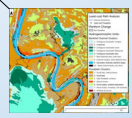
- Approach
  - We will couple **field sampling efforts** with integrated surface-subsurface **hydraulic models**
  - Sampling design will capitalize on the **natural physical gradients** within the UMRS to generate process-based knowledge at a few locations that can be translated to other locations
  - Sampling along **longitudinal gradients** (1 representative site per USACE district - 3 total) and **lateral gradients** (hydro-geomorphic units at each site)







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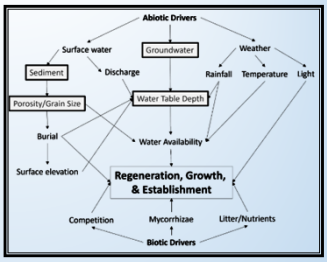
- Main expected outcome
  - Detailed description of forest dynamics, water availability, and soil characteristics as context for inferring biophysical relationships on landform features outside the study areas
  - Development of a conceptual model of biophysical processes in the UMRS floodplain
  - Assessment of UMRS floodplain inundation model performance in groundwater applications



33

Strategic approach to identify HREP features that promote dense and diverse mussel assemblages

USGS: Kristen Bouska, Traci DuBose, Teresa Newton
USACE: Davi Michl, Dan Kelner, Luci Sawyer, Trevor Cyphers, Mike Dougherty, Kara Mitvalski
USFWS: Sara Schmuecker
State Representatives: TBD
NGO Representatives: TBD

Objective	Approach
Develop a conceptual model that describes suitable habitat for mussels in the UMRS	Convene a workshop with state, federal, and NGO partners to capture data needs to conserve and manage mussels in the UMRS with an emphasis on those habitat features that can be manipulated in HREPs
Summarize existing data on mussels and HREPs, identify physical habitat variables that drive dense and diverse mussel assemblages, and identify those response metrics most suited to evaluate the success of a given HREP	Synthesize the literature to (1) identify habitat variables that contribute to dense and diverse mussel assemblages, (2) assess if features added to existing HREPs (i.e., rock size, placement) enhanced mussel assemblages, and (3) identify response metrics that could be incorporated into future monitoring
A guidance document that describes a conceptual approach for how to incorporate mussel features into HREPs	Summarize the results into a guidance document for best management practices for incorporating mussel features into HREPs

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Main Expected Outcome

Best Management Practices for Incorporating Mussel Features into Habitat Restoration and Enhancement Projects

Chapter 1: Identifies habitat features likely to support dense and diverse mussel assemblages in the UMRS

Chapter 2: Summarizes prior HREPs where mussel features have been incorporated and synthesizes lessons learned

Chapter 3: Summarizes the ranges of habitat variables that support dense and diverse mussel assemblages in the UMRS

Chapter 4: Identifies which response metrics in mussels are best suited to evaluate HREPs

Chapter 5: Identifies the frequency and duration of needed monitoring

Chapter 6: Outlines information gaps needed to refine design criteria for incorporating mussel features into future HREPs

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Recommended for funding during FY2024

- Associations among hydrogeomorphology, water chemistry, and the distribution and abundance of biota in the upper Mississippi river under climate change
- Generating future hydrology and water temperature projections for the UMRS using hybrid deep learning (*Funding for FY2025 only*)
- Submersed plant responses to wind, waves, water velocity, and shear stress
- In-depth characterization of phytoplankton communities and toxicity across connectivity gradients along 450 miles of the Upper Mississippi River System
- Hindcasting and forecasting abiotic drivers of UMRS fish populations and advancing management and research tools for non-game fishes
- Using sUAS to monitor and survey regeneration and recruitment in areas of forest canopy loss
- Understanding the role of surface-subsurface hydrology and soil characteristics on floodplain vegetation in the UMRS through space and time
- Strategic approach to identify HREP features that promote dense and diverse mussel assemblages

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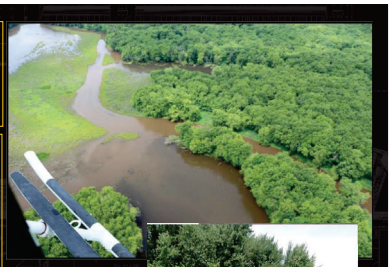
UMRR HREP
BEAVER ISLAND

Steve Gustafson, PG, IGCP
Civil & Environmental Engineering
US Army Corps of Engineers
Rock Island District

May 2024

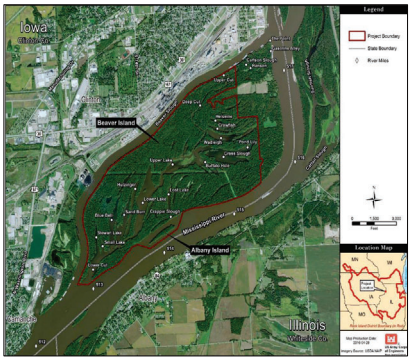


U.S. ARMY

US Army Corps of Engineers

PROJECT LOCATION

Pool 14, UMR Miles 513-517
Clinton County, IA
Upper Mississippi River National Wildlife & Fish Refuge (Corps and FWS owned, U/S end is privately owned)
One of the largest islands on the Mississippi River
Mississippi Flyway
Pool 14 has a high abundance of mussels
1,635 Acres
- Interconnected waters
- Secondary channels
- Wetlands
- Floodplain



TIMELINE

• Factsheet	April 2006
• Feasibility and EA Approval	August 2017
• Stage I Award Contract	July 2018
• Stage IB Award Contract	December 2018
• Forestry TSI/Planting Award Contracts	August 2020
• Forestry TSI/Planting Completion	Ongoing (Dec 2024)
• Stage I/IB Construction Complete • Actual cost to date: $17,110,155	February 2024
• Ribbon Cutting	Late Summer 2024

PROBLEMS & OPPORTUNITIES

Problems:
Sedimentation –
- Sediment entering interior lakes
- Loss of aquatic habitat diversity due to shallow backwater lakes

Floodplain forest is dominant monotypic (maple)
Erosion at the bankline and islands

Opportunities:

- Improve the quality and diversity of aquatic habitat
- Create and restore deep water habitat,
- Improve and increase habitat quality and diversity of floodplain forest
- Address future sedimentation

GOALS, OBJECTIVES AND MEASURES

Goals	Objectives	Potential Enhancement Measures
Restore and Protect Off-Channel Aquatic and Wetland Habitat	Increase year-round aquatic habitat diversity, as measured by acres and native fish use of spawning, rearing and overwintering habitat Increase structure and function of side channel habitat, as measured by native freshwater mussel use	Excavate backwater areas to ensure a depth and velocity appropriate for year round fish use Construct water control structures and/or river training structures to protect existing islands and provide appropriate velocities for fisheries and mussels. Install rock substrate at the appropriate depth and location for freshwater mussel use
Restore Floodplain Forest Habitat	Diversify floodplain forest habitat on Beaver Island, as measured in acres of elevated topography and number of hard mast tree species present in Project area	Increase elevation of existing topography to obtain optimum heights for tree survivability Plant native bottomland forest species in sufficient density to diversify tree species present in Project area

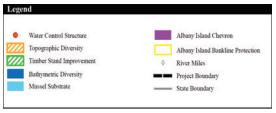
HABITAT FEATURES

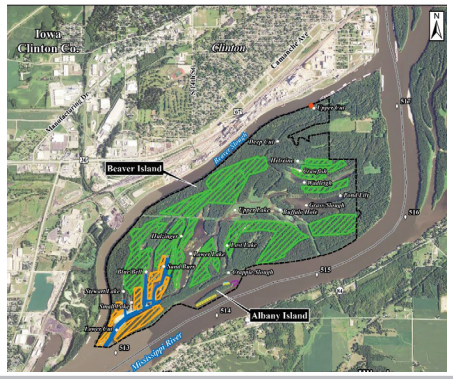
Increase year-round aquatic habitat diversity
- Excavate backwater areas (depth, velocity)
- Construct water control structures
- Lower Cut, Stewart Lake, Blue Bell, Sand Burr, Blue Bell to Sand Burr, Sand Burr to Hulziger
- Incorporate Fisheries Structures

Diversify Floodplain Forest Habitat
- Increase elevation of existing topography to obtain optimum heights for tree survivability
- Plant native bottomland species to diversity species in project area
- Timber Stand Improvements

Increase Structure and Function of Side Channel Habitat for freshwater mussel use
- Protect backwater channel through stabilizing existing island
- Install rock substrate for mussel use

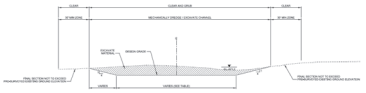
BEAVER ISLAND HREP FEATURES



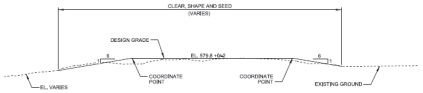


Aquatic & Topographic Diversity

Overwintering habitat dredging
- 8 feet below flat pool
- 4H:1V slopes
- Anchored logs
- 453,513 cubic yards dredged
- Approximately 31 acres @ 8 ft

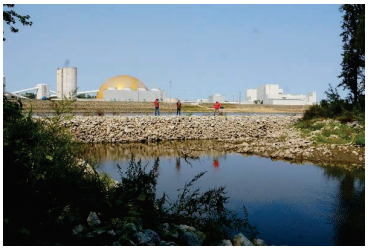


Constructed berms
- 1 to 10 feet above existing ground (8 ft above flat pool)
- 6H:1V slopes



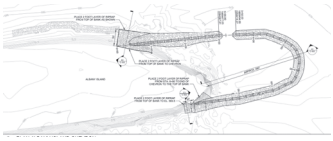
KEEPING SEDIMENT OUT – CLOSURE STRUCTURE

- Upstream end of Upper Cut/Deep Cut and is adjacent to Beaver Slough.
- Significant sediment transport entered this channel and was filling backwater lakes and channels.
- Structure was conducted prior to dredging to increase the life of the dredge cuts for long term habitat benefits
- Constructed to reduce sedimentation into the site.



MUSSEL HABITAT PROTECTION

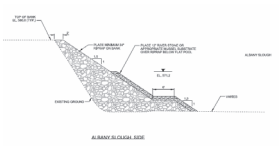
Albany Island
- Island degradation over time
- Protect adjacent mussel beds by protecting the island
- Chevron constructed on the upstream end.
- Bankline Protection constructed along navigation side of channel to reduce erosion.



PLACING MUSSEL SUBSTRATE

River stone sized for mussel habitat added along chevron and Albany Island

Mussels discovered in stone following construction



POST CONSTRUCTION MUSSEL SURVEY

- Post-construction mussel monitoring event 31 July to 3 August 2023 (end of the third growing season post-construction).
- Both quantitative and qualitative timed search survey methods were used to evaluate mussel colonization of the placed substrate and mussel bed characteristics.
- Native mussels successfully colonized the three mussel substrate sites three years post-construction.
- It may be too early to determine whether the substrate areas observed are in the process of early mussel bed establishment or are serving as a "sink" where mussels drop off host fish or wash into the sites and persist at a short time (three-years post-construction) without mussel bed formation or a shift to more equilibrium life history strategy dominated species.

Albany Slough Mussel Substrate Site 3 mussels – from timed search.

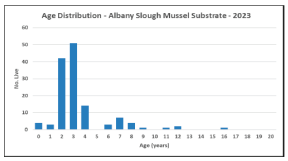
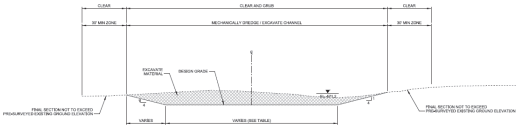


Figure 7. Mussel Age Class Distribution from Quantitative and Timed Searches at the Albany Slough Mussel Substrate Sites, 2023.

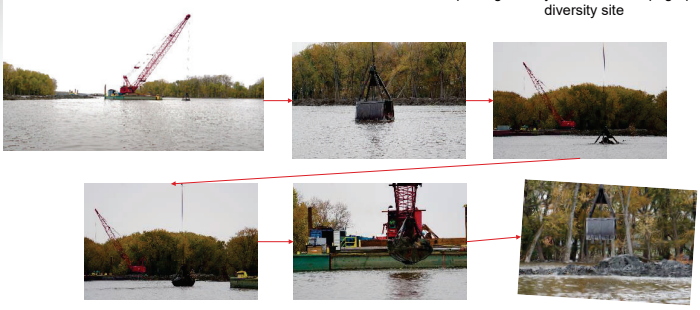
ECOSYSTEM DREDGING/EXCAVATION

- Very shallow backwater lakes prior to excavation
- Material was removed from backwater channels and lakes
- Material was sidecast or transported to topographic diversity sites
- Anchored logs were added to the channels to promote diversity for aquatic habitat



Side Cast Material

Barge mounted crane reaches bucket into river and captures material, swinging around and placing directly at the future topographic diversity site



FILLING A HOPPER BARGE

DOUBLE HANDLED MATERIAL

Hopper barge is transported to final placement site

Crane lifts material from hopper barge and places at future topographic diversity site

ANCHORED LOGS

BUILDING SUSTAINABLE FORESTS

- Sites selected for topographic diversity are lower elevation and are not supporting forest regeneration at this time.
- Photos were taken on the same day of higher elevation ground supporting diverse age and species outside of the proposed project area, as opposed to even aged stand, laden with sediment and no regeneration within the proposed areas.
- Widths and lengths vary
- Several locations
- Follows Natural Contours
- Height selected to maximize survivability (EFM), but no impact floodplain or wetlands
- Detailed planting methods for forested wetland trees, shrubs and seeding

Upstream Healthy Forest

Downstream Stressed Forest

TOPOGRAPHIC DIVERSITY – MATERIAL PLACED

TOPOGRAPHIC DIVERSITY - SHAPING

FLOOD LINE MATCHING SURVIVING TREE LINE AND TOP OF BERM SEPTEMBER 2021

TOPOGRAPHIC DIVERSITY - REGENERATION

TREE PLANTINGS

Forested Wetland Trees	
Common Name	**Scientific Name**
#3 RPM (108 trees per acre)	
River Birch	*Betula nigra*
Northern Pecan	*Carya illinoinensis*
Shellbark Hickory	*Carya laciniosa*
Common Hackberry	*Celtis occidentalis*
Common Persimmon	*Diospyros virginiana*
Honey Locust	*Gleditsia triacanthos*
Kentucky Coffeetree	*Gymnocladus dioicus*
American Sycamore	*Platanus occidentalis*
Swamp White Oak	*Quercus bicolor*
Bur Oak	*Quercus macrocarpa*
Pin Oak	*Quercus palustris*
Overcup Oak	*Quercus lyrata*
#5 RPM (48 trees per acre)	
River Birch	*Betula nigra*
Northern Pecan	*Carya illinoinensis*
Shellbark Hickory	*Carya laciniosa*
Common Hackberry	*Celtis occidentalis*
Common Persimmon	*Diospyros virginiana*
Honey Locust	*Gleditsia triacanthos*
Kentucky Coffeetree	*Gymnocladus dioicus*
American Sycamore	*Platanus occidentalis*
Swamp White Oak	*Quercus bicolor*
Bur Oak	*Quercus macrocarpa*
Pin Oak	*Quercus palustris*
Overcup Oak	*Quercus lyrata*
#15 RPM (27 trees per acre)	
River Birch	*Betula nigra*
Northern Pecan	*Carya illinoinensis*
Shellbark Hickory	*Carya laciniosa*
Common Hackberry	*Celtis occidentalis*
Common Persimmon	*Diospyros virginiana*
Honey Locust	*Gleditsia triacanthos*
Kentucky Coffeetree	*Gymnocladus dioicus*
American Sycamore	*Platanus occidentalis*
Swamp White Oak	*Quercus bicolor*
Bur Oak	*Quercus macrocarpa*
Pin Oak	*Quercus palustris*
Overcup Oak	*Quercus lyrata*
MISCELLANEOUS	
TREE WRAPS (#3/#5 Trees)	
TREE WRAPS (#15 Trees)	

SHRUBS

Forested Wetland Shrubs	
#3 RPM (60 plants per acre)	
Common Name	**Scientific Name**
Common Buttonbush	*Cephalanthus occidentalis*
Red-Osier Dogwood	*Cornus stolonifera*
Silky Dogwood	*Cornus amomum*
American Elderberry	*Sambucus canadensis*
Northern Spicebush	*Lindera benzoin*
American Bladdernut	*Staphylea trifolia*

SEEDING AND PLANTING CUTTINGS

Buffer Seed and Cutting		
Common Name	**Scientific Name**	**Application Rate**
Black Willow	*Salix nigra*	500 cuttings per acre
Cottonwood	*Populus deltoids*	500 cuttings per acre
River Birch	*Betula nigra*	60,000 seeds per acre
Buttonbush	*Cephalanthus occidentalis*	60,000 seeds per acre

Understory Seed 125,000 seeds per acre		
Common Name	**Scientific Name**	**Percentage of Mixture**
Virginia Wild Rye	*Elymus virginicus*	12.5%
Canada Wild Rye	*Elymus canadensis*	12.5%
Partridge Pea	*Chamaechrista fasciculata*	12.5%
Buttonbush	*Cephalanthus occidentalis*	12.5%
Rice Cut Grass	*Leersia oryzoides*	12.5%
Cardinal Flower	*Lobelia cardinalis*	12.5%
Sneezeweed	*Helenium autumnale*	12.5%
Swamp Milkweed	*Asclepias incarnata*	12.5%

TIMBER STAND IMPROVEMENT - CROP TREE RELEASE

TIMBER STAND IMPROVEMENT - THINNING

Tree Thinning

Stump Sprout

TIMBER STAND IMPROVEMENT – CLEARING TO ALLOW LIGHT

QUESTIONS?

Where do small fish originate from in the Upper Mississippi River System?

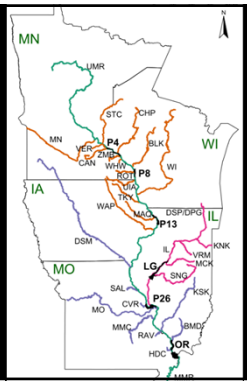
Shaley Valentine
UMRR-Coordinating Committee
5/22/24


ORIGINAL ARTICLE
Freshwater Biology WILEY
Network connectivity contributes to native small-bodied fish assemblages in the upper Mississippi River system
Shaley A. Valentine | Kristen L. Bouska | Gregory W. Whitledge

Valentine et al. 2024 Freshwater Biology

1

Tributaries are important physical features, nodes of connectivity, and habitat



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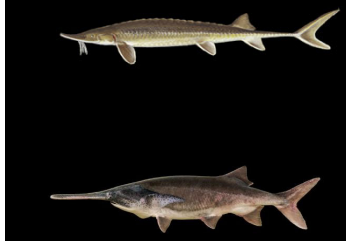

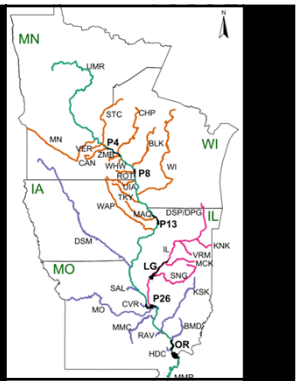

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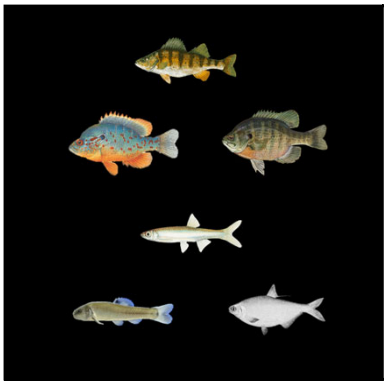
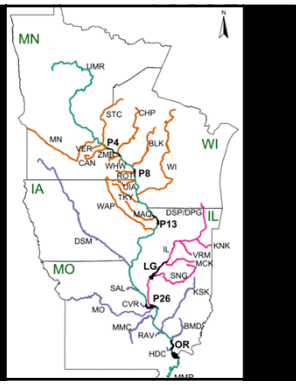
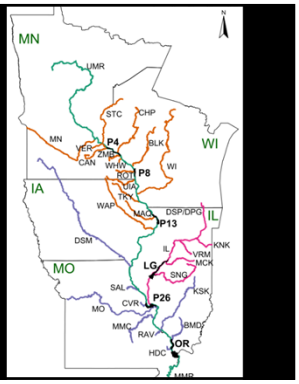




4

How do tributaries and network connectivity contribute to native fish origins?

- Where are fish originating?
- Does origin vary across species and spatially?



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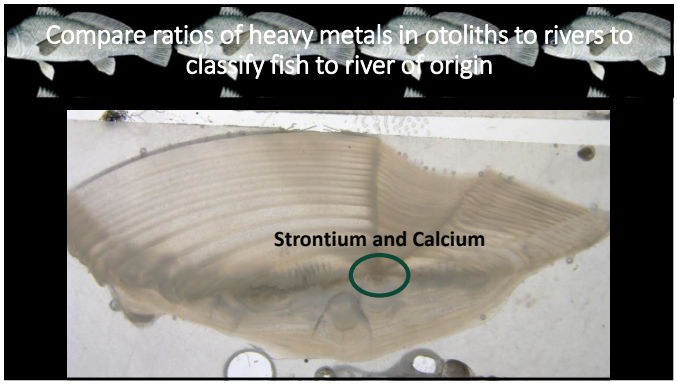
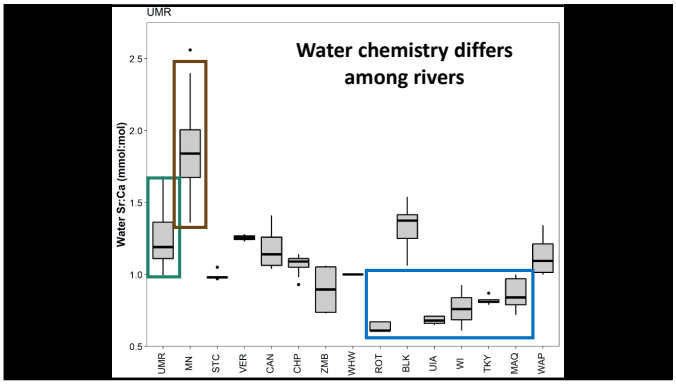
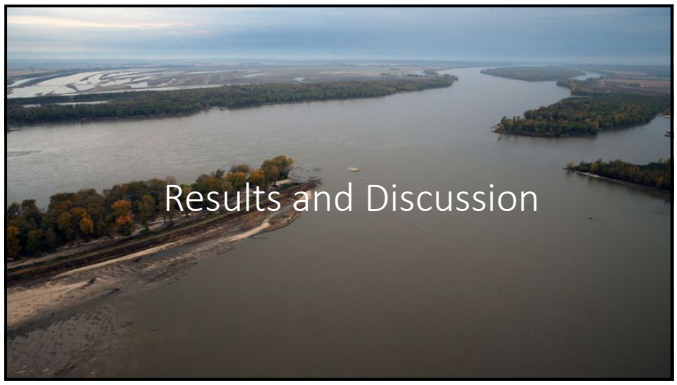

Compare ratios of heavy metals in otoliths to rivers to classify fish to river of origin
Strontium and Calcium

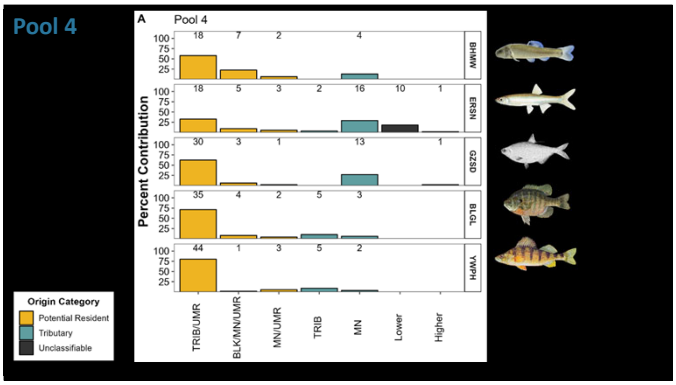
7


Water chemistry differs among rivers
Water Sr:Ca (mmol:mol)
UMR
MN
STC
VER
CAN
CHP
ZMB
WHW
ROT
BLK
UIA
WI
TKY
MAQ
WAP

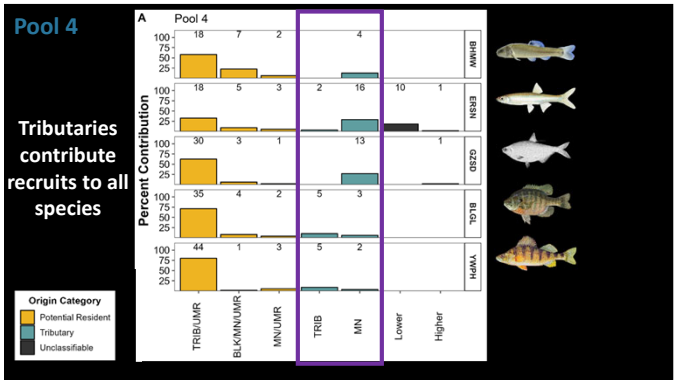
8


Results and Discussion

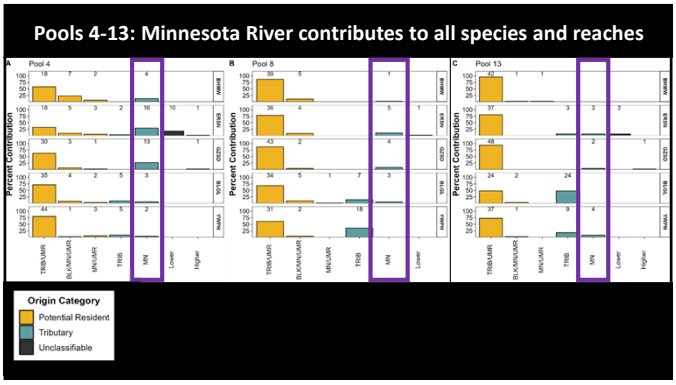
9


Pool 4
Percent Contribution
Origin Category
Potential Resident
Tributary
Unclassifiable
TRIB/UMR
BLK/MN/UMR
MN/UMR
TRIB
MN
Lower
Higher

10

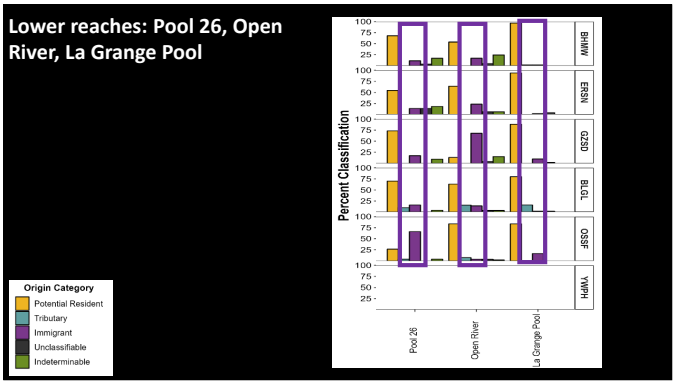

Pool 4
Tributaries contribute recruits to all species
Percent Contribution
Origin Category
Potential Resident
Tributary
Unclassifiable

11


Pools 4-13: Minnesota River contributes to all species and reaches
Origin Category
Potential Resident
Tributary
Unclassifiable

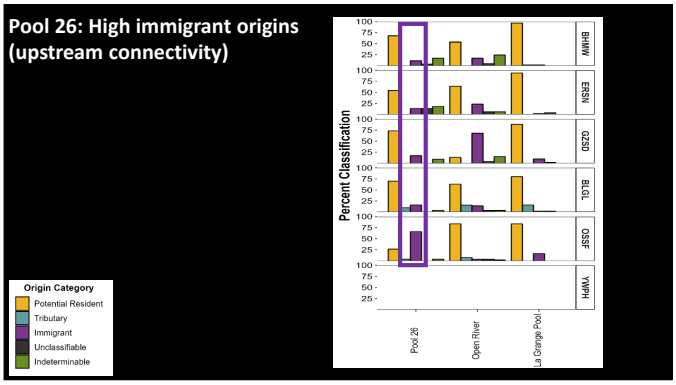
12

Lower reaches: Pool 26, Open River, La Grange Pool



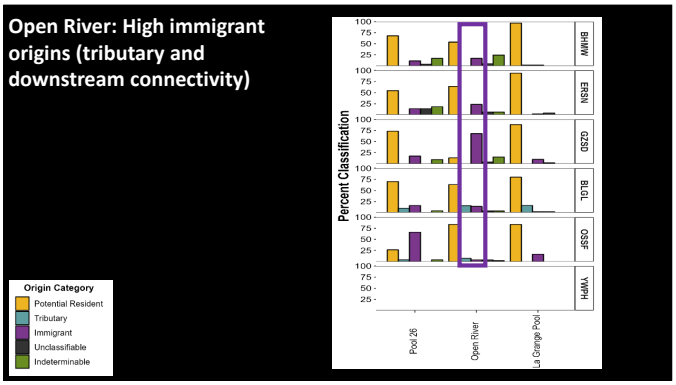
13

Pool 26: High immigrant origins (upstream connectivity)



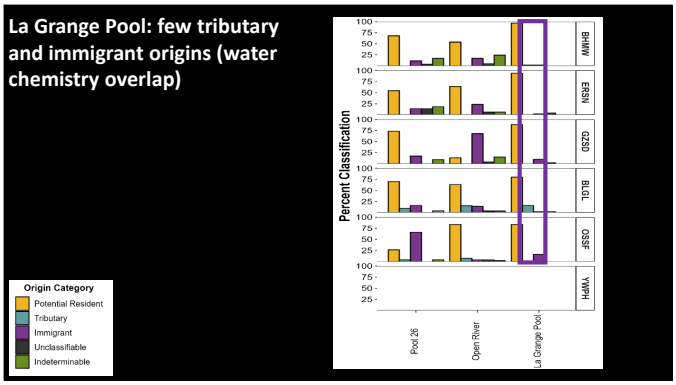
14

Open River: High immigrant origins (tributary and downstream connectivity)



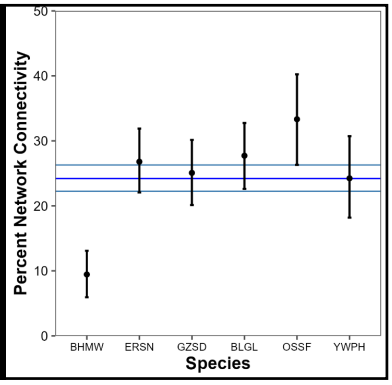
15

La Grange Pool: few tributary and immigrant origins (water chemistry overlap)



16

Network Connectivity: Percent of individuals with tributary, immigrant, and unclassifiable origins



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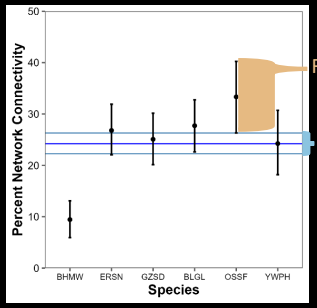
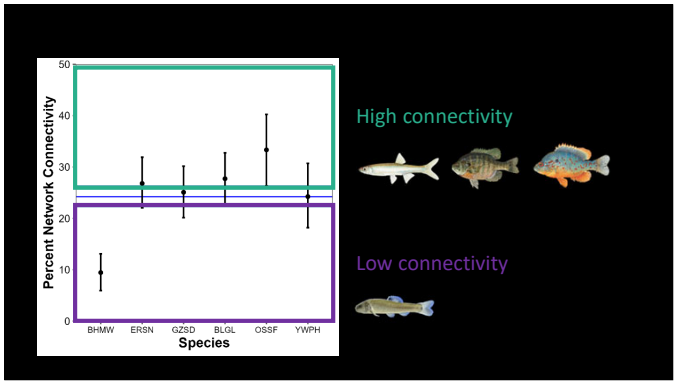


Resampled distribution from one species

Resampled distribution from across all species

24% of all fish originated from tributaries or other reaches

18



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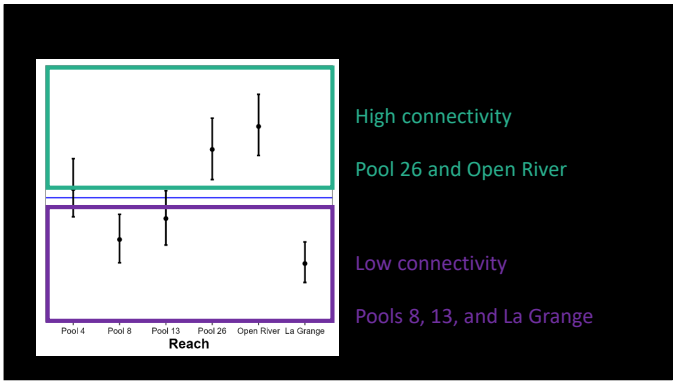

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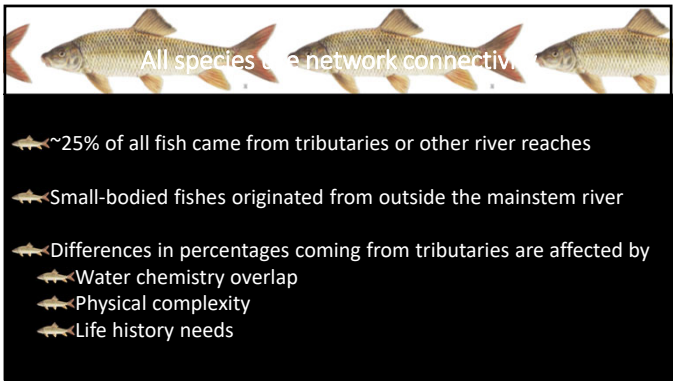

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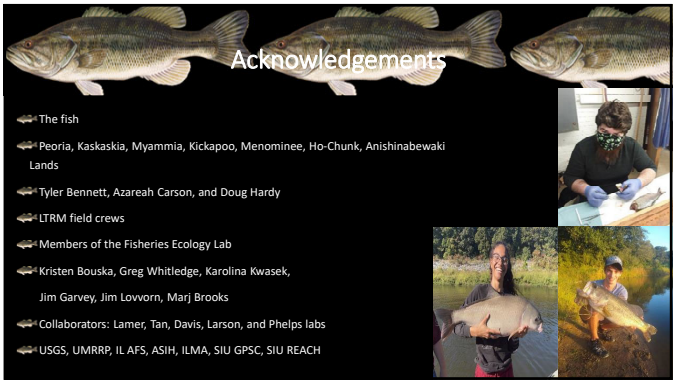

24

Thank you!

Shaley Valentine

shvalent@illinois.edu

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LOWER MISSISSIPPI RIVER COMPREHENSIVE MANAGEMENT STUDY (LMRCMS)

UPPER MISSISSIPPI RIVER RESTORATION PROGRAM COMMITTEE MEETING
22 MAY 2024

Cherie Price
Senior Plan Formulator
Regional Planning and Environment Division South
USACE New Orleans District

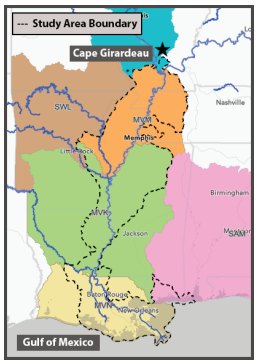
U.S. ARMY
US Army Corps of Engineers

AUTHORITY & PLANNING REGIONS

Lower Mississippi River Comprehensive Management Study
Authorization: Water Resources Development Act of 2020, Section 213

(1) PURPOSE – The Secretary, in collaboration with the heads of other Federal agencies and pursuant to subsection (d)(1)(A), shall conduct a comprehensive study of the Lower Mississippi River basin from Cape Girardeau, Missouri, to the Gulf of Mexico. The study will identify recommendations of actions to be undertaken by the Secretary, under existing authorities or after congressional authorization, for the comprehensive management of the basin for multiple purposes:

A. Hurricane and storm damage reduction, flood risk management, structural and nonstructural flood control, and floodplain management strategies; (*Priority Missions*)
B. Navigation (*Priority Mission*)
C. Ecosystem and environmental restoration (*Priority Mission*)
D. Water supply (*Explore when Compatible*)
E. Hydropower production (*Explore when Compatible*)
F. Recreation (*Explore when Compatible*)
G. Other purposes as determined by the Secretary



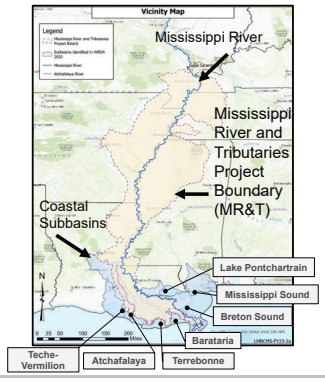
STUDY AREA BOUNDARY

The Lower Mississippi River Basin, from Cape Girardeau, Missouri, to the Gulf of Mexico

Includes portions of 7 states: Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, & Tennessee

6 USACE districts: New Orleans, Vicksburg, Memphis, St. Louis, Little Rock, & Mobile

Incorporates the Mississippi River and Tributaries (MR&T) Project Area as well as the coastal subbasins mentioned in WRDA 2020.

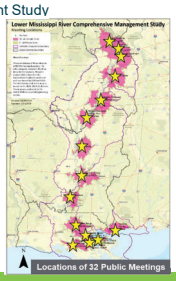


SCOPING EFFORTS

Lower Mississippi River Comprehensive Management Study

Problems, Opportunities, Constraints and Measures solicited from:

- **Phase 0**
  - Regional USACE (all Disciplines), ERDC, Technical Team
- **Charrettes -- 6-meeting series + 3 regional technical meetings**
  - USACE, ERDC, Federal & State Agencies, Tribal Nations, Target Academia
- **Interagency Meetings** (Next one in June)
  - Federal & State Agencies
- **NGO & Academia Engagements** (Next one planned for July)
- **30 Public Meetings**
  - Comments received through 02 April, currently processing input
- **Tribal Nations Meeting** (16 April)
  - Comments received through 16 May, scheduling one on one meetings



Where we started:

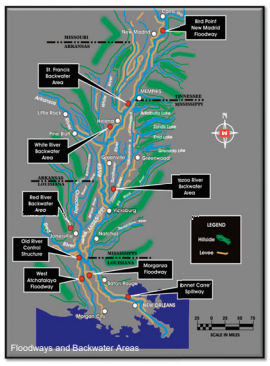
- **387 Problems**
- **147 Opportunities**
- **400 + Measures**

WHAT RECOMMENDATIONS MAY COME FROM THE STUDY?

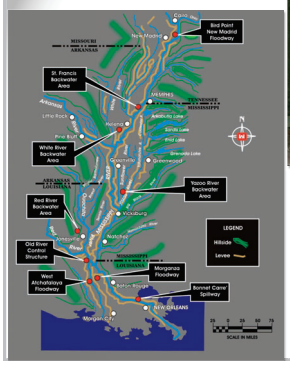
1. Construction of new projects
2. Modifications to existing projects (structurally or operationally)
3. Monitoring of or adaptive management measures for existing projects to respond to changing conditions
4. Improving the efficiency of operational and maintenance dredging within the study area;
5. Whether changes are necessary to the Mississippi River and Tributaries (MR&T) Project within the Study area;
6. Other Federal and non-Federal action, where appropriate
7. Follow-up studies and data collection and monitoring to be carried out by the relevant Federal or State agency

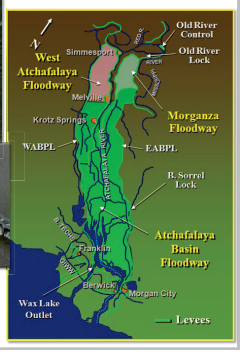

Levee Setback (Source:TNC)


Old River Control Structure


Floodways and Backwater Areas

EXISTING SYSTEM





FOUNDATIONAL STUDIES

Hydro Delta Management Study, 2019

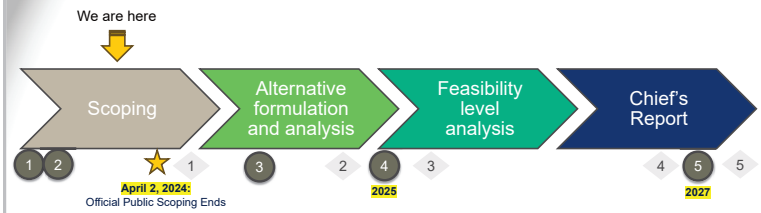
LMRRA, 2015

Flowline Assessment, 2018

OMAR Report, 2022

2011 Post Flood Report, 2017

HOW ARE WE CONDUCTING THE STUDY?



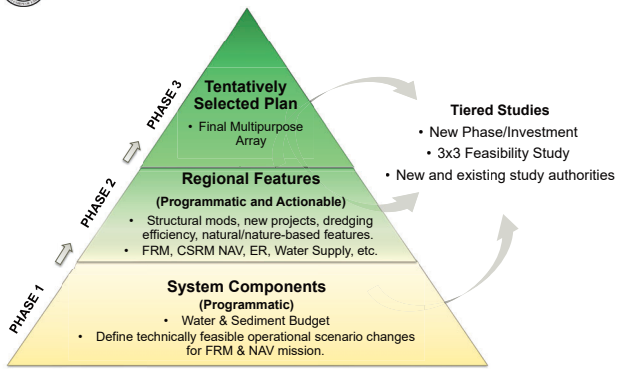
Feasibility Study Process

1. Alternatives Milestone
2. Tentatively Selected Plan Milestone
3. Agency Decision Milestone
4. State and Agency Review
5. Chief of Engineer's Report with Final NEPA Documentation

NEPA Process During Feasibility

1. Identify Need for Action
2. Begin Scoping
3. Begin Drafting NEPA documentation
4. Release Draft NEPA documentation for Public, Technical & Policy Review
5. Publish and Distribute Final NEPA documentation

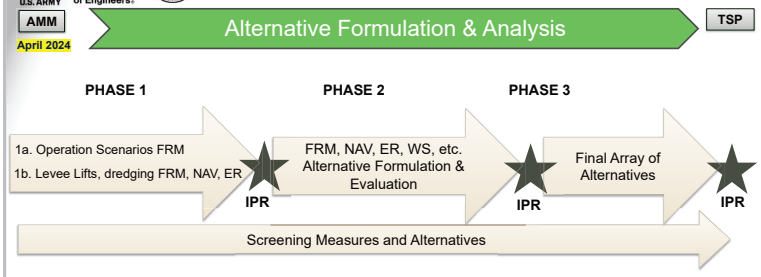
PLAN FORMULATION FRAMEWORK



Tiered Studies

- New Phase/Investment
- 3x3 Feasibility Study
- New and existing study authorities

PHASED APPROACH TO TSP



WHAT WE HEARD DURING PUBLIC SCOPING

Illinois

Flood Risk Management
- Expand the footprint of the MR&T levee system to include local levee systems, like Len Small
- Concerns about interior drainage issues and associated damages
- Concerns about operation & maintenance of existing floodwalls and pump stations
- Local infrastructure resiliency post flooding

Ecosystem Restoration
- Concerns about habitat degradation due to operations & maintenance of existing structures

Recreation
- Improve recreation associated with levee/floodwall footprints

Missouri

Flood Risk Management
- Concern that ecosystem measures could reduce level of flood protection

Recreation
- Improve river recreation between Cape Girardeau & Cairo

Kentucky

Recreation
- Improve river recreation between Cape Girardeau & Cairo

Tennessee

Navigation
- Continue to alleviate impacts to Navigation from extreme low water events

Water Supply
- Groundwater

Arkansas

Navigation
- Continue to alleviate impacts to Navigation from extreme low water events

Recreation
- Improve recreation associated with levee/floodwall footprints

Water Supply
- Groundwater

Communication
- State Partnering Group – does it represent all state agencies and concerns

Unfiltered Public Comments Received as of 18-March-24

Common Feedback

Navigation
- Maintain a 12' navigation channel in the MS River including the harbors
- Reoccurring port access issues from sedimentation
- Keep focus on completing MR&T, Flood Risk Management and Navigation

Flood Risk Management
- Reassess storage opportunities
- Re-evaluate management of reservoirs like the Kentucky and Barkley.
- Maintain levees & structures and replace older structures and dams.

Ecosystem Restoration
- Concerns about habitat degradation from operations and maintenance of existing structures

Water Supply
- Water quality, pollution and sedimentation issues in the lower river.
- Identify where groundwater is depleted and implement groundwater projects

Programmatic Comments
- Expand USACE authorization beyond the MS River.
- Consider upstream influences (i.e. Ohio River) on the lower river
- Consider impacts to industry, agriculture and water supply
- How will LMRCMS affect existing federal projects and vice versa
- "Do no harm" to the MR&T System
- Improve outreach to the public, increase public awareness

Mississippi

Flood Risk Management
- Maintain levees & structures and replace older structures and dams. Keep flood control and navigation as the top priority.
- Reconnection of the Floodplain: what does it mean to the people and businesses of the Mississippi Valley, need to ensure Flood Risk Management is a priority

Water Supply
- A USACE water supply mission is essential to the future of the nation and would prevent other agencies such as the Bureau of Reclamation from dictating our water utilization.

Louisiana

Navigation
- Navigation impacts on Gulf Intracoastal Waterway (GIWW) when the Atchafalaya River is too high
- Replace and maintain navigation markers on the river
- Evaluate closing side channels (Mardi Gras & Neptune pass), to keep more water in the MS River and reduce maintenance in navigation channels.

Flood Risk Management
- Review 70/30 split at Old River Control, Atchafalaya flowline study, alternate sequencing of structure operations during Project Design Flood (PDF) and addressing flooding concerns with operations.
- Stabilize tributaries of the Miss. River for sediment management and maintenance of current federal levees.

Ecosystem Restoration
- Utilizing Beneficial Use of Dredge Material (BUDMAT) to restore coastal environments due to storm degradation.
- New structures/maintenance of existing structures needed on channels that have been cut off from the river to handle flooding that never used to happen.
- Complete extensive ecosystem restoration plan in the Atchafalaya Basin and prioritize implementation.
- Lower river productivity affected by reduced biomass due to dams.

Recreation
- Need to expand non-motorized trails in the Atchafalaya River.

Mississippi & Louisiana

Flood Risk Management
- Evaluate dredging at South Pass as an alternative to opening Bonnet Carre

Ecosystem Restoration
- Utilizing BUDMAT to restore coastal environments due to storm degradation.
- Change in Bonnet Carre operations to stop severe negative affects along the MS Coast to fisheries resources, local economics and tourism
- Effects of Mississippi River water on Mississippi Sound and the Gulf of Mexico and living resources.

Communication
- Public Hearings in Mississippi and other states semi-annually to allow more engagement with the Corps

PUBLIC SCOPING CAPE GIRARDEAU, MO AND CAIRO, IL

Flood Risk Management

- Expand MR&T footprint to include local levees such as Len Small and include other communities
- Concerns with interior drainage in communities including needing additional pump stations
- Operations of existing floodwalls and pump stations
- Local infrastructure resiliency post flooding
- Birds Point New Madrid – impacts of opening
- Ecosystem Measures can potentially reduce Flood Risk Management features

PUBLIC SCOPING CAPE GIRARDEAU, MO AND CAIRO, IL

Navigation, Ecosystem Restoration and Recreation

- Continue to alleviate impacts to navigation due to extreme low water events
- Habitat Degradation due to Operations and Maintenance of existing structures
- Improve River recreation at Cape Girardeau riverfront and between Cairo and Cape Girardeau
- Improve recreation associated with levee/floodwall footprints

ABBREVIATED MEASURE EXAMPLES - BY MISSION

Lower Mississippi River Comprehensive Management Study

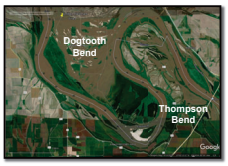
Flood Risk Management
- "Turn the knobs" to optimize water and sediment systemwide.
- Change the operational trigger for Morganza Floodway.

Navigation
- 12' Channel systemwide
- Lock in river geometries (including stabilizing cutoffs) to sustain navigation.
- Stabilize the Hickman Hardpoint to facilitate navigation.

Ecosystem Restoration
- Reconnect the river to the floodplain where possible.
- Restore and improve gravel bars for ecosystem restoration purposes.
- Vegetate new and existing levee setbacks with native rivercane as a primary species.

Water Supply
- Divert water to abandoned meanders and oxbow lakes to recharge groundwater levels for ecosystem restoration and water supply.
- Construct groundwater wells to restore baseflow to streams.

Recreation
- Add public river access for recreation, emergency ops, and river monitoring.



LOWER MISSISSIPPI RIVER RESOURCE ASSESSMENT LESSONS LEARNED

Ecosystem Restoration Alternatives

Potential Actionable Alternatives under LMR Comp

- Focus on Critical Habitats
- Oxbow lakes, meander scarps and gravel bars - less connected due to aggradation and degradation in the river
- Assess connectivity thresholds – how river connects to floodplain habitat
- Potential tiered (under new authority) study recommendation can be to implement long term data collection and habitat mapping and classification of lower river

WHERE DO WE GO FROM HERE

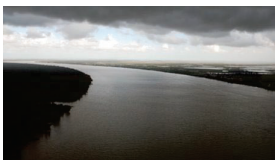
- ❑ Developing Public Scoping Report
- ❑ Public Engagement Meeting – 20 June 2024
- ❑ Interagency Coordination Meeting – TBD June 2024
- ❑ Running 1D system wide Hydraulic models to test different operational scenarios along the river
- ❑ Developing sediment transport model to evaluate operational scenarios from previous step and to determine long term geomorphic changes in the channel bed
- ❑ Screening measures and developing a list of alternatives

Alternatives provide solutions to identified problems and meet study objectives while avoiding constraints.

CONTACT

Website: https://www.mvn.usace.army.mil/About/LMRComp/

E-mail: lmrcomp@usace.army.mil



THANK YOU