

**Hampton Inn Gateway Arch  
St. Louis, Missouri**

**Upper Mississippi River Restoration Program  
Coordinating Committee**

**Quarterly Meeting**

**May 25, 2022**

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**Agenda  
with  
Background  
and  
Supporting Materials**

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**UPPER MISSISSIPPI RIVER RESTORATION PROGRAM  
COORDINATING COMMITTEE**

**May 24-25, 2022  
8:00 a.m. – 2:45 p.m. CST**

**Agenda**

**Tuesday May 24 Partner Quarterly Pre-Meetings**

- 3:45 – 5:00 p.m. Corps of Engineers
- 3:45 – 5:00 p.m. Department of the Interior
- 3:45 – 5:00 p.m. States

**Wednesday, May 25 UMRR Coordinating Committee Quarterly Meeting**

Time	Attachment	Topic	Presenter
8:00 a.m.		<b>Welcome and Introductions</b>	<i>Sabrina Chandler, USFWS</i>
8:05	A1-A15	<b>Approval of Minutes of February 23, 2022 Meeting</b>	
8:10		<b>Regional Management and Partnership Collaboration</b> <ul style="list-style-type: none"><li>▪ FY 2022 Fiscal Update and FY 2023 Outlook</li><li>▪ 2022 Report to Congress</li><li>▪ Status and Trends Report Release</li></ul>	<i>Marshall Plumley, USACE</i>
9:00		<b>2015-2025 Strategic and Operational Plan Review</b>	<i>Andrew Stephenson, UMRBA</i>
9:30		<b>Break</b>	
9:45		<b>Communications</b> <ul style="list-style-type: none"><li>▪ UMRR Communications Team</li><li>▪ Status and Trends Report Long Rollout</li><li>▪ External Communications and Outreach Events</li></ul>	<i>Rachel Perrine and Jill Bathke, USACE</i> <i>Andrew Stephenson, UMRBA</i> <i>All</i>
10:20		<b>UMRR Showcase Presentations</b> <ul style="list-style-type: none"><li>▪ MVS HREP Construction Lessons Learned</li><li>▪ Ageing Fish: How the past can provide insights into the future of the Upper Miss and Illinois Rivers.</li></ul>	<i>Jasen Brown, USACE</i> <i>Hae Kim, Missouri State University</i>
11:00		<b>Program Reports</b>	
	B1-B12	<ul style="list-style-type: none"><li>▪ Long Term Resource Monitoring and Science<ul style="list-style-type: none"><li>– LTRM FY 2022 2<sup>nd</sup> Quarter Highlights</li><li>– Status and Trends Report</li><li>– USACE LTRM Update</li></ul></li></ul>	<i>Jeff Houser, USGS</i> <i>Karen Hagerty, USACE</i>
	B13-B15	<ul style="list-style-type: none"><li>– FY 2022 Science Proposals</li><li>– A-Team Report</li><li>– Consideration of Endorsement of Science Proposals</li><li>– LTRM Implementation Planning Update</li></ul>	<i>Jeff Houser, USGS</i> <i>Scott Gritters, IA DNR</i> <i>Jeff Houser, USGS and Karen Hagerty, USACE</i> <i>Jeff Houser and Jennie Sauer, USGS and Karen Hagerty, USACE</i>

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## **Wednesday, May 25 (CONTINUED)**

Time	Topic	Presenter
12:00 noon	Lunch	
1:00 p.m.	<b>Program Reports (Continued)</b> <ul style="list-style-type: none"><li>▪ Habitat Restoration</li><li>– District Reports</li></ul>	<i>District HREP Managers</i>
2:00 p.m.	NESP Update	<i>Andrew Goodall, USACE</i>
2:30	<b>Other Business</b> <ul style="list-style-type: none"><li>▪ Future Meeting Schedule</li></ul>	
2:45 p.m.	Adjourn	

[NOTE: The UMRR Coordinating Committee will meet from 3-4:30 to discuss next steps to address recommendations from the Strategic Plan Review Survey results.]

**ATTACHMENT A**

**Minutes of the February 23, 2022**  
**UMRR Coordinating Committee Quarterly Meeting**  
*(A-1 to A-15)*

**Minutes of the  
Upper Mississippi River Restoration Program  
Coordinating Committee**

**February 23, 2022  
Quarterly Meeting**

**Virtual Meeting**

Brian Chewning of the U.S. Army Corps of Engineers called the meeting to order at 8:00 a.m. on February 23, 2022. UMRR Coordinating Committee representatives on the virtual meeting were Sabrina Chandler (USFWS), Mark Gaikowski (USGS), Chad Craycraft (IL DNR), Randy Schultz (IA DNR), Megan Moore (MN DNR), Matt Vitello (MO DoC), Jim Fischer (WI DNR), and Ken Westlake (USEPA). A complete list of attendees follows these minutes.

Andrew Stephenson said that Verlon Barnes retired from NRCS in October 2021. NRCS has not yet designated a new UMRR Coordinating Committee representative.

**Minutes of the November 17, 2021 Meeting**

Randy Schultz moved and Megan Moore seconded a motion to approve the draft minutes of the November 17, 2021 UMRR Coordinating Committee meeting as written. The motion carried unanimously.

**Regional Management and Partnership Collaboration**

Marshall Plumley said UMRR has several ongoing initiatives, including the 2022 Science Meeting, 2022 UMRR Report to Congress, project development teams (PDTs) working on multiple projects, and field staff work. Plumley expressed appreciation for the contributions and engagement from all partners.

*FY 2022 Fiscal Update*

Plumley reported that UMRR has obligated over \$9.5 million, or 28 percent, of its \$33.17 million FY 22 funds as of February 1, 2022. Awarding construction contracts in each district and funding science proposals developed during the 2022 science meeting will advance obligation through this fiscal year. On February 17, 2022, Congress passed a third continuing resolution authority (CRA) for FY 2022 extending current funding levels for the federal government until March 11, 2022. District staff are authorized to execute the program at \$33.17 million. The President's FY 22 budget includes \$33.17 million for UMRR. The House and Senate Appropriations Committees have both acted on appropriations bills for FY 2022 and concurred with the President's recommended amount for UMRR of \$33.17 million. The final FY 2022 appropriation is not yet known.

The plan of work for UMRR in FY 2022 at a \$33.17 million funding scenario is anticipated to be as follows:

- Regional Administration and Program Efforts – \$1,450,000
  - Regional management – \$1,180,000
  - Program database – \$100,000
  - Program Support Contract – \$120,000
  - Public Outreach – \$50,000
- Regional Science and Monitoring – \$10,250,000
  - Long term resource monitoring – \$5,000,000

- Regional science in support of restoration – \$3,800,000
- Regional science staff support – \$200,000
- Habitat evaluation (split across three districts) – \$1,125,000
- Report to Congress – \$125,000
- Habitat Restoration – \$21,470,000
  - Rock Island District – \$6,718,000
  - St. Louis District – \$7,502,000
  - St. Paul District – \$7,150,000
  - Model certification – \$100,000

Plumley said that, on November 15, 2021, the President signed the Infrastructure Investment and Jobs Act (IIJA). UMRR capabilities above a \$33.17 million annual execution capacity were submitted to the Administration for consideration in its work plan associated with implementing the IIJA funding. However, UMRR did not receive additional funding. Mississippi Valley Division received \$5.2 billion showing investment in the region. UMRR will continue to lean forward and look for opportunities to demonstrate capacity. The strong partnership, pipeline of projects, and ability to execute work will help UMRR compete. Multiple funding packages have been submitted for FY 2022 workplan funding. In response to a question from Megan Moore, Plumley said some of the recently identified HREPs are broader in scope and will require more resources than traditional HREPs and the partnership could discuss how to package them should additional opportunities for funding arise.

#### *UMRR Ten-Year Plan*

Plumley reported that the UMRR 10-year implementation plan was updated to reflect changes to project timelines. Feasibility was extended for the Lower Pool 10, Reno Bottoms, and Lower Pool 13 HREPs. Plumley noted that the Lower Pool 10 feasibility report received extensive comments. Ultimately, the Lower Pool 13 HREP was split into multiple phases. Design schedules for Harlow Island and Oakwood Bottoms HREPs were extended. Keithsburg construction is in progress, but the anticipated construction completion was extended to allow for additional real estate acquisition. Gilead Slough was identified as the next HREP to begin feasibility in MVS. The schedule will continue to be refined for outyears as more details and specificity on projects becomes available. Plumley also noted that colors on the chart were revised for increased legibility for individuals with color vision deficiencies.

In response to a question from Andrew Stephenson about the Lower Pool 10 HREP, Angela Deen said the comments were primarily from the agency technical review team and do not significantly change the selected plan but do take time to address. In response to a question from Stephenson, Plumley said recent funding levels have allowed UMRR to consider larger and more complex projects such as water level management, systemic forestry at a pool scale, and pool scale island protection. The complexity of planning for these projects is different than traditional HREPs and requires determining the right level of detail and suite of alternatives. Plumley added that, in efforts to prioritize projects in the future, UMRR will continue to maintain a mix of different size projects. In response to a question from Moore, Plumley said the TBDs on the 10-year plan represent anticipated projects to keep a healthy pipeline of projects but are funding dependent. Kirk Hansen noted that Lower Pool 13, Green Island, Pool 12 Forestry, and Quincy Bay HREPs are shown as beginning construction in MVR in the same fiscal year. Plumley acknowledged that was unlikely to occur and said the schedule will be refined as more detail and specificity on projects becomes available. Brian Chewning expressed appreciation for the balance of implementation across phases and districts.

#### *Acres Restored*

Plumley said the current schedule of HREP implementation would restore 76,110 acres between FY 2021 and FY 2031. This estimate assumes continued funding levels of \$33.17 million annually. Decreased funding levels would extend the end date for completing projects while increased appropriations could accelerate these restoration activities. The figure is an important communication tool for multiple audiences and will be included in the UMRR 2022 Report to Congress. Plumley said an alternate scenario based on full authorized funding of \$55 million is being developed.

### *Construction Completions*

Plumley reported that construction contracts on three projects, totaling 5,590 acres, were completed in calendar year 2021, increasing UMRR's total acres restored to approximately 112,000 acres through 59 completed projects. These projects include Conway Lake, Pool 12 Overwintering, and Ted Shanks. Some planting will be finalized in spring 2022. Another four projects are anticipated to be completed in 2022 that will collectively add 9,810 acres to UMRR's total restored or improved habitat. A table is being developed for the UMRR 2022 Report to Congress that lists the seven completed HREPs, seven HREPs in construction, and ten HREPs in feasibility across the program.

### *2015-2025 Strategic and Operational Plan Review*

Plumley reported that, on September 20, 2021, a survey was distributed to the UMRR partnership at-large regarding the 2015-2025 UMRR Strategic and Operational Plan. The purpose of the survey was to seek input regarding progress achieved since 2015, priorities for the next five years, and the issue areas to include in the 2022 Report to Congress. Plumley said preliminary results were shared at the UMRR Coordinating Committee's November 17, 2021 quarterly meeting. Primary successes of implementing the strategic plan and priority future actions for UMRR were incorporated into the draft 2022 UMRR Report to Congress. A finalized report on the survey results is anticipated to be submitted to the UMRR Coordinating Committee in March 2022 and a meeting will be convened to review and discuss the results.

### *2022 Report to Congress*

Plumley reported that, on January 24, 2022, a draft of the 2022 UMRR Report to Congress was submitted to UMRR Coordinating Committee members for initial review. Partner comments will be consolidated into one document and shared to ensure transparency in the report development. Plumley provided examples of comments received by the UMRR Coordinating Committee and proposed resolutions. He said there is a need to clarify restoration versus rehabilitation. Past reports have emphasized restoration, while rehabilitation is used specifically when we discuss HREPs and authority. Providing a definition of restoration for the report may help to address the issue. There is a need for additional detail on different groups that are discussed in the report, such as the river teams. Plumley said much of this information was recently assembled for the update to the UMRR Joint Charter and can be incorporated. Other recommended changes include identifying partners associated with case studies, adding context regarding how the system has changed, and developing a more complete history of influential legislation, coordination, and ecological events. Plumley said the report has been through initial technical editor review. Plumley reported that, on February 4, 2022, the first in-progress review (IPR) was held with MVD and USACE Headquarters (HQ). This provided an opportunity to engage with Headquarters reviewers early in the process. Partners will be asked to coordinate a more in-depth review within their respective agencies during March and April 2022 and to submit letters of support. In response to a question from Stephenson, Plumley said letters of support would be needed by August 2022 to be included in the package submitted to USACE HQ for review. In response to a question from Brian Chewning, Plumley said the first MVD and USACE HQ reviews are intended to be semi-formal to identify any red flags. There was also discussion of a second IPR with MVD and USACE HQ that has not yet been scheduled. Plumley said he would distribute letters of support from

past reports to Congress to UMRR Coordinating Committee members. Randy Schultz expressed appreciation to Marshall for offering to provide past letters of support. Hagerty said the 2016 Report to Congress is available on the UMRR website. Plumley expressed appreciation to the UMRR Coordinating Committee members for their review and to report authors and collaborators for developing the content, noting that it has been a collaborative and enjoyable experience pulling the document together.

Plumley said ten implementation issues were identified for issue paper development with some being geared internally toward program partners. Stephenson said draft implementation issue papers will be sent to the UMRR Coordinating Committee in two batches. The first batch will consist of issue papers addressing water level management, project partnership agreements, floodplain rise, and engaging non-traditional sponsors.

## **Communications**

### *UMRR Communications and Outreach Team*

Jill Bathke said the UMRR Communications and Outreach Team (COT) finalized the UMRR program flyer. The flyer was distributed electronically to COT members. COT members were asked to send requests for physical copies of the flyer to Jill Bathke and Rachel Perrine for a future print order. The COT also finalized a video highlighting UMRR history and partnership. The video is 508 compliant and the YouTube link (<https://www.youtube.com/watch?v=zy-40NiRuF8>) can be shared by partners on social media. The themes of the next three videos are:

1. Success of UMRR
2. Science on the river
3. Future of UMRR

In response to a question from Karen Hagerty, Bathke confirmed that both the history and partnership video and UMRR flyer can be posted to the UMRR website. Jennie Sauer applauded the COT for completing the video. Lauren Salvato and Kirsten Wallace echoed Sauer's comments on the quality of the video.

Rachel Perrine said that, to support the rollout of the Status & Trends Report 3rd Edition, COT members reviewed key messages and the report release strategy including a coordinated press release. COT members were asked to affirm their agency's ability to participate in the coordinated press release. COT members were also asked to identify their agency's events in 2022 that may relate to content included in the report (e.g., start of field station sampling, MUM activities) to inform additional engagement and communication opportunities this year. Perrine encouraged UMRR Coordinating Committee members and others to coordinate with their respective agency's COT member to ensure any opportunities and ideas can be incorporated into planning the long rollout. Wallace acknowledged the various related events or discussions that should be targeted for communications. For example, we can time communications of nutrient-related information to overlap with the annual announcement by NOAA of its Gulf Hypoxia prediction. Hagerty expressed appreciation for Bathke and Perrine's leadership of the COT.

Perrine said that other priority actions for the COT this year include completing the video series, updating the UMRR Communication and Outreach plan, and developing a communication and outreach materials inventory. Bathke said the updated plan will include goals, key messages, and talking points, clearly identify audiences, outreach tactics and spokespersons, and contain agency contacts, past actions, and schedules for future actions. Megan Moore expressed appreciation for the progress that has been made and asked how UMRBA would be involved in implementing the rollout for the Status and Trends report. Perrine said that UMRBA has taken the lead in developing the Status and Trends rollout and the COT is supporting the effort through discussion and review of materials. Stephenson said the COT will be integral to the integration of the rollout activities as well. In response to a question from Stephenson, Perrine did



receive confirmation from Susan Tesarik that Wisconsin DNR would participate in the coordinated press release and that a reminder will be sent to COT members reading due outs from the previous meeting.

#### *Status and Trends Report Strategic Rollout*

Stephenson provided an overview of the UMRR Status and Trends Report rollout strategy. The draft document is included in the meeting agenda packet as attachment C1-C10. The document outlines the purpose, goals, objectives, strategies and tactics, and key messages of the rollout including development of a coordinated press release. The draft press release information identifies common elements that all agencies could use in their communications. UMRR Coordinating Committee members were invited to provide feedback on the draft document and asked to affirm their agencies interest and ability to participate in the coordinated press release. A long rollout of the Status and Trends Report is in development. The purpose is to make the tremendous amount of information in the report accessible to key audiences as well as the interested public. UMRR Coordinating Committee members were asked to submit to Andrew Stephenson any anticipated or potential activities related to content in the report that their agencies may be involved with during 2022.

Hagerty suggested including key messages related to fish and aquatic vegetation. Brian Chewning noted that most of the FAQs are technical- or science-oriented and suggested including additional information about the “so what” or what it means to users. Stephenson agreed and said that will be a focus of the next step. Nat Miller said long-term wildlife and bird population trends help people better understand and connect with complex data around topics like vegetation quality and forest loss. Stephenson agreed and acknowledged the value in connecting to other information areas or sources. In response to a question from Randy Schultz, Stephenson said the purpose of an embargoed release is to allow information prior to an official release date for certain entities (e.g., media) to develop materials, with the understanding that the information must remain confidential until the official release. Houser expressed appreciation to Stephenson for his thought and effort into the release. Stephenson said, and Mark Gaikowski agreed, that it is good for the program to have this information in an accessible format. Gaikowski said he will need to confirm that an embargoed release is in compliance with USGS fundamental science practices, and he is also exploring a cooperator review process. Gaikowski said one key element of the report is a focus on increasing discharge, which was based on data collected by USGS stream gages. That key point could help highlight the interconnectedness of various data collection efforts in the basin and expand the relevance of LTRM data to other programs and efforts. Stephenson agreed and emphasized the potential to connect LTRM data to other efforts outside UMRR. Hagerty commended Stephenson for the work and Megan Moore agreed. Moore said she knows of a media source in Rochester, Minnesota who is eager to see the report. She added that Minnesota’s participation in the rollout would likely focus on the information specific to the state and that commitment beyond that would need review and approval by the Governor. Stephenson noted that it is helpful to understand the necessary approvals and potential restrictions across UMRR partner agencies to inform future partnership-wide communication efforts.

#### *External Communications and Outreach*

Wallace reported that the Hypoxia Task Force included a briefing from UMRR during its December 14, 2021 public meeting that was held virtually. KathiJo Jankowski and Lauren Salvato co-presented on nutrient-related information from the LTRM status and trends report. Wallace reported that she has had various follow up conversations with USEPA about the results as well as members of the HTF Coordinating Committee. Wallace said this connection to the Hypoxia Task Force has also provided a good opportunity to talk to USGS Headquarters and other staff about the LTRM dataset.

#### **UMRR Showcase Presentations**

*If You Restore It, Will They Come? Bluegill Status in Pool 12 Backwaters*

Seth Fopma, Iowa Department of Natural Resources (DNR) Bellevue field station, presented on the status of bluegill in Pool 12 backwaters. The Pool 12 Overwintering HREP was developed to address poor winter water quality conditions in Pool 12 backwaters. Winter water quality is primarily dictated by interactions amongst dissolved oxygen (DO), temperature, and flow. Management goals focus on ensuring adequate DO to sustain fish, but not too much to supersaturate the water. Different fish species and different size fish of the same species have different oxygen requirements. Pre-project telemetry showed distribution of crappie around the warmest water with sufficient oxygen while avoiding flow. One main project goal was to increase the diversity of depths in backwaters to provide more year-round fish habitat. Project features included dredging in four backwater lakes, increasing island topographic diversity and forest diversity, as well as managing backwater connectivity. To evaluate the project, the IA DNR has conducted annual sampling including pool-wide, day electrofishing in the fall and fyke netting in eight study backwaters once water temperatures fall below 10 degrees Celsius. Fyke net catch per unit effort (CPUE) from 2006 to 2020 includes nearly 29,000 fish from four dredged and four non-dredged backwaters. Approximately 8,500 aging structures have been sampled as well showing almost no fish older than five years of age. In Sunfish Lake, over twice as many fish have been captured in the five years of post-construction monitoring than in the nine years of pre-project monitoring. Comparisons of total fish lengths, show more even distribution of lengths after construction than before. Black crappie showed a similar trend with increased CPUE post-construction and a shift to larger size distribution after construction. Preliminary analysis is encouraging, but dredging was just recently completed in other project areas and it will take a few more years of monitoring work to conduct post-construction comparisons on all project areas. In response to a question from Kristen Bouska, Fopma said he has started to look at age distributions through time and that there are differences on 10 mm length-bands pre and post construction. Jordan Weeks commended Fopma and others for the work. Kirk Hansen said they will be comparing age distributions and annual mortality rates at each lake.

#### *Huron Island HREP*

Collin Moratz, USACE RPEDN, provided an overview of the Huron Island HREP in Pool 18. One main goal of the project is to improve both submerged and emergent aquatic vegetation. Most backwaters in the area do not have aquatic vegetation. Emergent vegetation was planted in 40 exclosures and submergent species were planted at two depths in exclosures with three different mesh sizes to assess herbivore impacts. Mortality of emergent plants ranged from zero to 100 percent mortality with most having less than fifty percent mortality. There was no mortality observed in 2021 of plants that had survived the first year and overwintered from 2020 to 2021. Despite extended high water in early 2020, white waterlily and longleaf pondweed survived. Wild celery was planted in 2021. Depth impacted survival of wild celery and shallow areas were more suitable for growth. All wild celery outside of the exclosures succumbed to herbivory. White waterlily and longleaf pondweed expanded outside the exclosures and survived through the growing season. Testing of “vegetative exclosures” by planting wild celery surrounded by waterlily or pondweed is underway. In 2021, volunteer patches of lotus were observed on a shallow shelf next to a dredge cut. Full-scale monitoring of initial plantings will conclude in 2022. In response to a question from Tim Yager, Moratz said plants were collected in 2019 from nearby areas including Lake Odessa and Cone Marsh and then cultivated by ERDC in Texas. The furthest plants collected were wild celery from Pool 13. In response to a question from Karen Hagerty, Moratz said that water quality data analysis will be incorporated in the final report to investigate potential growing season stressors (e.g., turbidity). In response to a question from Jeff Houser, Moratz explained that cage size did not appear to affect herbivory and the most likely herbivores include turtles or grass carp. If crayfish were the main herbivores, the exclosures would not have been effective. Kirk Hansen said commercial catch indicates carp have been present in the area for years. Hansen said it is especially hopeful to see volunteer beds of lotus. In response to a question from Matt Mangan, Moratz said larger exclosures could work, but may be more difficult to maintain. The

enclosures that were used were battered by ice and flooding and lids were not maintained on all of them. Larger enclosures would be similarly affected by natural forces and conditions.

### **Habitat Restoration**

Angela Deen said MVP's planning priorities include the Big Lake (Lower Pool 4), Reno Bottoms (Pool 9), and Lower Pool 10 HREPs. Feasibility planning continues for Big Lake and will focus on developing measures. Reno Bottoms is continuing in feasibility and is evaluating seven alternatives. Concurrent review was completed for Lower Pool 10 and a final report is anticipated to be submitted to MVD in the coming week. Plans and specs for the project will focus on the southern third of the project area first. MVP has four projects in construction across a wide range of sizes and cost estimates with the smallest project in construction at \$4 million and the largest at over \$17 million. McGregor Lake is sixty-five percent complete. Contract terms for the Option 2 expired; the team is working toward re-advertising the remainder of the project in summer 2022. Harpers Slough is eighty-five percent complete and low water is needed for final grading and seeding in the spring. Bass Ponds and Conway Lake are both over ninety percent complete. A ribbon cutting ceremony for Bass Ponds is anticipated in May 2022. All features are physically complete at Conway Lake and willows will be planted in the spring. MVP will hold an Earth Day event on April 22, 2022 at the Driftless Area Education and Visitors Center in Lansing, Iowa to celebrate and dedicate the completion of both Harpers Slough and Conway Lake. In response to a question from Andrew Stephenson, Deen said repairs on the Harpers Slough habitat project were completed on the same footprint as the original project but some extra rock was added to the stress point to increase resilience. In response to a question from Brian Chewning, Deen said there will be a 50-person limit at the in-person ribbon cutting or Harpers Slough, but that a virtual option to participate will be available via Facebook Live.

Julie Millhollin said MVR's planning priorities include Lower Pool 13, Green Island, Pool 12 Forestry, and Quincy Bay HREPs. Cost estimates for projects in feasibility range from \$10 million to \$40 million. The Lower Pool 13 PDT is working to finalize all costs and benefits for alternatives with an aggressive goal for a tentatively selected plan by the end of March. The Green Island PDT is working on costs, quantities, and benefits for alternatives. The Pool 12 Forestry PDT is addressing District Quality Control comments on chapters one to three and working to identify alternatives. The Quincy Bay PDT is working to schedule a measures workshop in the coming months. MVR's design priorities are Steamboat Island Stages I and II. Steamboat Stage I is a good fit should the program receive additional work plan funds. MVR has five projects in construction. Pool 12 Overwintering Stage II is complete, the contract is being closed out, and the PDT is working on a ribbon cutting video. The contractor at Keithsburg Division Stage II is clearing trees. Eagles are very active in the area. ERDC will assess aquatic vegetation plantings in late-June or July 2022 at Huron Island Stage III. The contractor at Beaver Island will complete minor grading and seeding in the spring. MVD approved two more MVR fact sheets and MVR has one more fact sheet to submit.

Brian Markert said MVS has a variety of sized projects as well as diversity in the management requirements of projects. Some are more passively managed and designed to work with the system and others are more actively and intensively managed. MVS's planning priorities include West Alton Islands and Yorkinut Slough HREPs. Feasibility planning continues at West Alton Islands. An IPR with MVD for Yorkinut Slough was held in December 2021 and a habitat workshop was held in January 2022 to discuss alternatives. MVS's design priorities include Piasa & Eagles Nest, Harlow Island, and Oakwood Bottoms. Design for Piasa and Eagles Nest Islands is complete, and the plan is to award hydraulic dredging for Stage II in the fourth quarter of FY 2022. Harlow Island Stage 2 plans and specs are anticipated to be completed and ready to advertise in late FY 2022, pending funding and priorities. Oakwood Bottoms has four plans and specs packages in development and the project is anticipated to be ready to advertise in the third quarter of FY 2022. MVS has three projects in construction. Construction at Crains Island is ahead of schedule and one of two modifications has been completed.

Construction of a rock structure at Piasa & Eagles Nest is ongoing. Testing of the new pump station at Clarence Cannon was completed and earthwork on a berm setback will occur in the spring. Other MVS activities include sponsor review of fact sheets, a flood damage assessment on Swan Lake HREP, and summarizing lessons learned from past and current HREP construction efforts. In response to a question from Dave Glover regarding using Swan Lake to trap and dispatch invasive carp, Sabrina Chandler said the Service is still trying to accomplish invasive species control and habitat management with drawdowns, and Swan Lake normal routine management has resulted in removing a significant number of carp. Chandler noted that the high Illinois River water levels impacted the ability to fully draw down the area last year.

## **Long Term Resource Monitoring and Science**

### *FY 2022 1<sup>st</sup> Quarter Report*

Jeff Houser reported that accomplishments of the first quarter of FY 2022 include publication of the following manuscripts:

- *Aquatic vegetation assemblage and diversity dynamics in the Upper Mississippi River over two decades spanning vegetation recovery.* Two main findings include identification of some substantial similarities in how vegetation communities changed over time and the rate of their change over time in Pools 4, 8, and 13. Pools 4 and 8 have been relatively stable, but Pool 13 shows less stability in recent years, which has implication for potential future trajectories of those vegetation communities.
- *Gene flow influences the genomic architecture of local adaptation in six riverine fish species.* This work comes from the genetics portion of the vital rates project and was a proposal funded through the 2020 Science Meeting. The paper examined population structures of six systemic fish species across LTRM study reaches and the extent to which genetics relate to life history of those species. Species that have relatively low gene flow tend to be nest spawners whose eggs are not transported by the current, and species showing high gene flow were often broadcast spawners which rely on the current to disperse eggs. Genetic structures of populations reflect biological processes.

Houser said other ongoing LTRM activities include winter water quality sampling, processing of phytoplankton and fish samples, contributing to the 2022 UMRR Report to Congress, LTRM implementation planning, and preparing the water quality lab for a temporary move to the University of Wisconsin – La Crosse while the UMESC lab is renovated.

### *2022 Science Meeting*

Houser reported that the 2022 LTRM Science Meeting was held virtually on February 8-11, 2022 with over 100 participants representing 17 agencies, organizations, and institutions. The meeting utilized a professional facilitator and virtual tools including Mural and Google Docs for communal work and Padlet for participant introductions. The science meeting is a forum for collaborative development of “science in support of restoration” projects. It fosters the development of larger projects that more effectively incorporate UMRR LTRM’s unique strengths and facilitates a more direct interaction between restoration practitioners, natural resource managers, and research scientists during proposal development. The primary goal was to develop proposals for consideration in FY 2022. Other meeting outcomes include ideas for future work and improved connections across the UMRS network of restoration professionals and river/floodplain scientists. The meeting had six working groups that met concurrently. A special session was held to discuss the Lower Pool 13 HREP as a learning opportunity. The full LTRM data record is available for that navigation pool and an HREP is currently being

planned. The goal of this session was to understand how to best take advantage of the existing data and expertise of field station staff nearby. The working groups and proposals in development are included below:

- Hydrology and geomorphology
  - Hydrogeomorphic model validation
  - Topographic and bathymetric systemic data updates and maintenance
  - Evaluating LOCA-VIC-MizuRoute Hydrologic Products for UMRR use (future hydrology)
- Macroinvertebrates
  - Assess long term changes and spatial patterns in macroinvertebrates using a modified version of LTRM macroinvertebrate sampling.
- Water plants and water birds
  - Wild celery
  - Quantifying energy provided by aquatic and floodplain plant communities as waterfowl forage over the past four decades.
- UMRS fisheries
  - How do hydrology and temperature interact to affect year class strength of select species representing different habitat classes of fishes?
  - What are the environmental growth signatures of these select species and are they closely linked to recruitment?
  - How are fluctuations in populations size and recruitment linked to changes in growth and/or mortality?
- Nutrients, Phytoplankton, and Harmful Algal Blooms
  - Long-term trends in phytoplankton communities in the UMRS
  - Filling in the gaps with Fast Limnological Automated Measurements (FLAMe)
- Floodplain Ecology
  - Forest dendrochronology
  - Wildlife (bird) use of the UMRS floodplain
  - Relationships among flood inundation, vegetation patterns, and soil nutrient dynamics

Houser said draft proposals and budgets are due to Jennie Sauer and Karen Hagerty by March 18, 2022 for budget review. Final proposals are due on April 4, 2022 to the A-Team, USACE, and USGS for review and ranking. A list of recommend proposals will be submitted to the UMRR Coordinating Committee for consideration of endorsement at the May 25, 2022 quarterly meeting.

In response to a question from Wallace, Houser said the plan to request endorsement from the UMRR Coordinating Committee follows past procedure and that a list of recommended proposals will be provided in the May quarterly meeting packet. Nat Miller and Hagerty expressed appreciation to Houser and the LTRM science leads for the effective process to identify future science priorities. Andrew Stephenson applauded the success of the science meeting and suggested conducting similar exercises to the Lower Pool 13 discussion for other HREPs in trend pools, such as Pool 4 Big Lake. Deen said that the LTRM district representative has been engaged during planning of Pool 4 Big Lake.

Houser said he would be interested in further discussions on Pool 4 Big Lake and said his participation in all stages of the Pool 13 HREP has been useful. Houser expressed appreciation for the energy, enthusiasm, and effort that all participants brought to the science meeting and noted that there were still 90 percent of attendees at the plenary on Friday.

### *Status and Trends 3<sup>rd</sup> Edition*

Houser reported the Status and Trends Report 3rd Edition has completed USGS' Science Publishing Network (SPN) review and is ready to undergo Center Director review. After the Center Director review is complete, the Bureau Approving Official (BAO) will review the document and the finalized text and figures will be sent to desk top publishing for final formatting. After final review of the formatted report is complete, it will be ready for release. The report is anticipated to be released in late-March to early-April 2022.

### *USACE LTRM Report*

Karen Hagerty said UMRR's LTRM FY 2022 budget allocation will follow FY 2021 allocations if the program receives \$33.17 million in funding. That is, \$6.3 million (\$5.0 million for base monitoring and \$1.3 million for analysis under base) with an additional \$2.5 million available for "science in support of restoration and management." At the November 17, 2021, quarterly meeting, the UMRR Coordinating Committee endorsed funding of an outstanding balance on LTRM (\$554,097) as well as FY 22 IWW monitoring (\$32,135) and IWW aerial data collection report (\$25,034). The bulk of science in support of restoration and management funds, approximately \$1.7 million, will go to proposals from 2022 science meeting. Any remaining funds could be used to support the last year of LC/LU processing.

### *LTRM Implementation Planning*

Hagerty said WRDA 2020 raised the UMRR authorized funding level to \$55 million, which increases LTRM from \$10.42 million to \$15 million. The UMRR Coordinating Committee directed an *ad hoc* team to develop a facilitated process to identify priority science needs currently being unmet and priority actions to address those needs to inform future LTRM spending, should UMRR receive additional funds. The *ad hoc* LTRM implementation planning team has held recurring bi-weekly meetings with the selected facilitators, Max Post van der Burg and Dave Smith from USGS. The *ad hoc* team is preparing for the first official group meeting to be held virtually on March 31, 2022. The first meeting will focus on expectations, format of the workshops, discussion of a problem statement, and logistics. It is expected that the entire implementation planning process will take place over the next year. Workshop participants were selected to represent the diversity of partners and aspects of the program and will be asked to communicate outward to their respective agencies. Participants include:

Jeff Houser*	Karen Hagerty*	Jim Fischer*	Kirk Hansen
Jennie Sauer*	Davi Michl	Madeline Magee	Jim Lamer
Kristen Bouska	Rob Cosgriff	Nick Schlessner*	Matt Vitello*
Nate De Jager	Steve Winter	Rob Burdis	Molly Sobotka
Robb Jacobsen	Matt Mangan	Neil Rude	Andrew Stephenson*

\*Denotes member of *ad hoc* planning team

Jennie Sauer said regular progress updates will be provided to the UMRR Coordinating Committee at quarterly meetings, but that participants are also expected to communicate outward to their agency throughout the process. Sabrina Chandler asked if the implementation planning process will cover better integration of LTRM and HREP. As an example, Chandler said Kirsten Schmidt's vegetation monitoring work can have direct impacts on how HREPs are planned and designed. Hagerty said the Lower Pool 13 habitat project is a good example of efforts to integrate program elements. Chandler

asked if pre and post project monitoring could be institutionalized differently through the implementation planning process. Hagerty said the science proposal process involves considerations of benefits to HREPs and cited the floodplain inundation model as an example. Sauer said the *ad hoc* team decided that LTRM/HREP integration would not be evaluated as part of this process. Houser acknowledged the lack of a group to actively explore the variety of ways that program elements are integrated or ways to increase integration among various programmatic functions, but that the issue is raised often in various discussions. Houser agreed that Lower Pool 13 is a good example. He acknowledged the integrated nature of the LTRM Science Meeting as well as the ongoing efforts of LTRM staff to participate in HREP workshops. Houser suggested employing a concerted effort to focus on programmatic integration. Chandler agreed and said a concerted effort would be more effective and efficient in the long run but acknowledged current workload challenges for all partners. Hagerty suggested revisiting the topic after the Report to Congress is completed. Ken Westlake said the line between HREP and LTRM may not be entirely clear in all UMRR activities and pointed out that there may be more moments of integration than we have acknowledged. Westlake said the ongoing efforts to evaluate ecological responses to HREPs (e.g., Pool 12 Bluegill study) occur routinely and that the 2022 status and trends report may inform what kinds of habitat needs may be more pressing in certain areas of the river. Hagerty said the Habitat Needs Assessment-II (HNA-II) is another example. Stephenson said many of the identified efforts to further integrate program elements will be included in the 2022 UMRR Report to Congress and suggested the ongoing review of the 2015-2025 Strategic and Operational Plan may provide additional insights. Houser said the small ongoing efforts are helpful to advancing the overall goal.

#### *A-Team Report*

Scott Gritters said the A-Team did not meet this quarter, but A-Team members participated in the 2022 Science Meeting. The A-Team has discussed updates to the A-Team corner on the LTRM website via email. The A-Team is planning to meet after April 4, 2022, to review science proposals. The next regular meeting of the A-Team is anticipated for mid-May 2022. Scott Gritters said he is also working to update the A-Team email distribution list.

#### **Navigation and Ecosystem Sustainability Program**

Andrew Goodall reported that, on January 19, 2022, NESP received a construction new start and construction general appropriations through the IJJA. The two projects funded through IJJA were the new L&D 25 1200-foot chamber and the L&D 22 fish passage. The Corps will immediately begin developing a plan for completion of both projects with a goal to begin construction as quickly as possible. Goodall acknowledged that NESP will alter the future of the UMRS to ensure it remains a vital transportation and ecosystem corridor.

- The new 1200-foot lock at L&D 25 was fully funded at \$732 million and is 100 percent federal funded – i.e., is not subject to typical Inland Waterway Trust Fund cost-sharing requirement. The primary purpose of the project is to improve efficiency, reliability, and safety for navigation traffic as well as to add operational redundancy at Lock 25. When complete, the new lock will reduce per lockage times from two and half hours or more to approximately 45 minutes.
- L&D 22 fish passage was partially funded at \$97.1 million. This funding will allow for completion of design and initiation of construction. The primary purpose of the project is to increase access to upstream mainstem river and tributary habitats. When complete, the fish passage structure will permanently restore the connection between river pools for native fish species. Increased access to upriver habitats will result in an increase in the size and distribution of 30 native migratory fish populations. The overall project cost is approximately \$137 million with remaining unfunded project elements primarily for post-construction monitoring and adaptive management.

In response to a question from Karen Hagerty, Goodall explained that L&D 25 involves site specific mitigation. NESP also includes a substantial systemic mitigation component. In response to a question from Matt Vitello, Goodall said L&D 22 fish passage needs an additional \$40 million to complete construction efforts and fund adaptive management. A portion of the appropriated \$97.1 million will be used for pre-project monitoring. Funding to address adaptive management for fish passage is a priority for the Corps and will be advanced when the need arises. Goodall acknowledged that NESP has many other projects to advance as well. Vitello encouraged engagement and discussion with the partnership as priorities are identified and advanced. In response to a question from Ken Westlake, Goodall said L&D 22 fish passage is 100 percent federal funding in the authorization and the L&D 25 lock modernization does not require cost-share from the Inland Waterways Trust Fund. In response to a question from Andrew Stephenson, Goodall said funding adaptive management for fish passage may be prioritized in 5-7 years once construction is complete.

Goodall said the twelve “Group 1” project fact sheets were approved by MVD. Funding for NESP is included in the House and Senate FY 22 appropriations measures at \$22.5 million and \$45.1 million, respectively. Should NESP receive those funds, the program will focus on partner consultation, program coordination, and advancing construction-ready projects and a subset of the Group 1 projects.

Additional navigation and ecosystem projects that are construction ready for FY 22 include:

Navigation (Total \$12.5M)

- Lock 14 Mooring Cell
- Moore’s Towhead Systemic Mitigation

Ecosystem (Total \$10M)

- Pool 2 Wingdam Notching
- Twin Islands Island Protection
- Alton Pool Side Channel and Island Protection
- Starved Rock Habitat Restoration and Enhancement

In response to a question from Kirsten Wallace, Goodall said funding of the two projects through IJJA gives NESP a construction new start. Wallace said it will be important for the partnership to have robust and frequent planning conversations regarding how NESP and UMRR work together to advance the needs of the region. Goodall agreed that it will be important be on the same page collectively. In response to a question from Westlake, Goodall said the Corps would allocate the potential FY 2022 funding for NESP to advance navigation and ecosystem priorities. Westlake asked, and Goodall confirmed, the FY 2022 funds would fund the set of construction-ready ecosystem projects as well as a set of the recently approved “Group 1” fact sheets. In response to a question from Westlake, Brian Johnson said the six construction-ready projects have undergone the environmental reviews.

In response to a question from Stephenson, Goodall acknowledged the need for the partnership to define comparable progress. Stephenson observed that collectively defining comparable progress would be an important initial conversation. Mark Gaikowski asked where and when those discussions may occur and if it would be within UMRBA, UMRR Coordinating Committee, or NESP specific partnership calls. Wallace said UMRBA has been a venue historically and, absent a formal NESP coordinating body, could be an appropriate forum to host discussions among the partnership about comparable progress and other NESP policy issues. Kraig McPeck emphasized the need for formal discussion and institutional arrangements. Goodall said consultation with partners is required in NESP’s authorization and committed to establishing effective partner coordination. Wallace said it will be important to have the NESP coordinating body, but it will also be important to have conversation beyond a particular authority to ensure the region is aligned on how best to address its needs. She noted that important questions to address include LTRM and partners’ capacity to implement NESP and UMRR. Wallace said UMRBA



will begin setting up scoping calls for partners to advance this discussion. Megan Moore said Minnesota DNR welcomes the opportunity for discussion around institutional arrangements.

### **Other Business**

Ken Westlake announced that he is retiring from USEPA at the end of April 2022. Westlake is helping the agency identify how best to staff UMRBA and UMRR functions that he has staffed over the last 12 years. Westlake said it has been a privilege to work on UMRR and that he has been impressed by the professionalism of all those who have been a part of the program. Many meeting attendees congratulated Westlake on his upcoming retirement and expressed appreciation for his integral role over many years.

Upcoming quarterly meetings are as follows:

- **May 2022 – St. Louis**
  - UMRBA quarterly meeting – May 24
  - **UMRR Coordinating Committee quarterly meeting – May 25**
  
- **August 2022 – TBD**
  - UMRBA quarterly meeting – August 9
  - **UMRR Coordinating Committee quarterly meeting – August 10**
  
- **November 2022 – TBD**
  - UMRBA quarterly meeting – November 15
  - **UMRR Coordinating Committee quarterly meeting – November 16**

With no further business, Chad Craycraft moved and Randy Schultz seconded a motion to adjourn the meeting. The motion carried unanimously, and the meeting adjourned at 1:59 p.m.

**UMRR Coordinating Committee Virtual Attendance List  
February 23, 2022**

**UMRR Coordinating Committee Members**

Brian Chewning	U.S. Army Corps of Engineers, MVD
Sabrina Chandler	U.S. Fish and Wildlife Service, UMR Refuges
Mark Gaikowski	U.S. Geological Survey, UMESC
Chad Craycraft	Illinois Department of Natural Resources
Randy Schultz	Iowa Department of Natural Resources
Megan Moore	Minnesota Department of Natural Resources
Matt Vitello	Missouri Department of Conservation
Jordan Weeks	Wisconsin Department of Natural Resources [on behalf of Jim Fischer]
Ken Westlake	U.S. Environmental Protection Agency, Region 5

**Others In Attendance**

Jim Cole	U.S. Army Corps of Engineers, MVD
Thatch Shepard	U.S. Army Corps of Engineers, MVD
Ben Robinson	U.S. Army Corps of Engineers, MVD
Leann Riggs	U.S. Army Corps of Engineers, MVD
Jim Lewis	U.S. Army Corps of Engineers, MVD
Jonathan Sobiech	U.S. Army Corps of Engineers, MVP
Terry Birkenstock	U.S. Army Corps of Engineers, MVP
Steve Clark	U.S. Army Corps of Engineers, MVP
Angela Deen	U.S. Army Corps of Engineers, MVP
Chris Erickson	U.S. Army Corps of Engineers, MVP
Jill Bathke	U.S. Army Corps of Engineers, MVP
Marshall Plumley	U.S. Army Corps of Engineers, MVR
Mark Cornish	U.S. Army Corps of Engineers, MVR
Jodi Creswell	U.S. Army Corps of Engineers, MVR
Karen Hagerty	U.S. Army Corps of Engineers, MVR
Julie Millhollin	U.S. Army Corps of Engineers, MVR
Davi Michl	U.S. Army Corps of Engineers, MVR
Collin Moratz	U.S. Army Corps of Engineers, MVR
Rachel Perrine	U.S. Army Corps of Engineers, MVR
Andrew Goodall	U.S. Army Corps of Engineers, MVR
Rachel Hawes	U.S. Army Corps of Engineers, MVR
Brian Markert	U.S. Army Corps of Engineers, MVS
Brian Johnson	U.S. Army Corps of Engineers, MVS
Jasen Brown	U.S. Army Corps of Engineers, MVS
Abby Hoyt	U.S. Army Corps of Engineers, MVS
Greg Kohler	U.S. Army Corps of Engineers, MVS
Sara Schmuecker	U.S. Fish and Wildlife Service, IIFO
Lauren Larson	U.S. Fish and Wildlife Service, IIFO
Matt Mangan	U.S. Fish and Wildlife Service, IIFO
Tim Yager	U.S. Fish and Wildlife Service, UMR Refuges
Kraig McPeck	U.S. Fish and Wildlife Service, UMR Refuges
Jeff Houser	U.S. Geological Survey, UMESC
Jennie Sauer	U.S. Geological Survey, UMESC
Jennifer Dieck	U.S. Geological Survey, UMESC
Kristen Bouska	U.S. Geological Survey, UMESC
Danelle Larson	U.S. Geological Survey, UMESC
JC Nelson	U.S. Geological Survey, UMESC

Dave Glover	Illinois Department of Natural Resources
Dave Bierman	Iowa Department of Natural Resources
Scott Gritters	Iowa Department of Natural Resources
Seth Fopma	Iowa Department of Natural Resources
Kirk Hansen	Iowa Department of Natural Resources
Neil Rude	Minnesota Department of Natural Resources
Trey Cooke	The Nature Conservancy
Doug Blodgett	The Nature Conservancy
Olivia Dorothy	American Rivers
Lindsay Brice	Audubon
Nat Miller	Audubon
Ethan Thompson	Great Rivers Environmental Law Center
Paul Dierking	HDR
Doug Daigle	Lower Mississippi River Sub-Basin Committee
Rick Stoff	<i>Our Mississippi</i>
Kirsten Wallace	Upper Mississippi River Basin Association
Andrew Stephenson	Upper Mississippi River Basin Association
Mark Ellis	Upper Mississippi River Basin Association
Lauren Salvato	Upper Mississippi River Basin Association

## **ATTACHMENT B**

### **Long Term Resource Monitoring and Science**

- **Base Monitoring Scope of Work thru 2nd Quarter of FY 2022 (5/5/2022)** *(B-1 to B-4)*
- **FY 2022 UMRR Science Activities in Support of Restoration and Management (5/5/2022)** *(B-5 to B-11)*
- **FY 2014 and FY 2015 UMRR Science Activities in Support of Restoration and Management (5/4/2022)** *(B-12)*
- **FY2022 UMRR Science Proposals Recommended for Funding** *(B-13)*  
The document containing the full version of each of the recommended proposals can be found here: <https://umrba.org/document/umrr-coordinating-committee-fy22-science-proposals-funding>.
- **Estimated Budgets for UMRR Science Proposals** *(B-14)*
- **UMRR Science Proposal Evaluation and Ranking Criteria** *(B-15)*

Upper Mississippi River Restoration  
Long Term Resource Monitoring Element  
FY2022 Base Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
<b>Aquatic Vegetation Component</b>						
2022A1	Complete data entry and QA/QC of 2021 data; 1250 observations.					
	a. Data entry completed and submission of data to USGS	30-Nov-2021		30-Nov-2021		Lund, Carhart, Fopma
	b. Data loaded on level 2 browsers	15-Dec-2021		15-Dec-2021		Schlifer
	c. QA/QC scripts run and data corrections sent to Field Stations	28-Dec-2021		28-Dec-2021		Sauer, Schlifer
	d. Field Station QA/QC with corrections to USGS	15-Jan-2022		15-Jan-2022		Lund, Carhart, Fopma
	e. Corrections made and data moved to public Web Browser	30-Jan-2022		30-Jan-2022		Larson, Schlifer, Caucutt
2022A2	Web-based: Creating surface distribution maps for aquatic plant species in Pools 4, 8, and 13; 2021 data	31-Jul-2022				Larson, Schlifer
2022A3	Wisconsin DNR annual summary report 2021 that combines current year observations from LTRM with previous years' data, for the fish, aquatic vegetation, and water quality components.	30-Sep-2022				Bartels, Hoff, Kalas, Carhart
2022A4	Complete aquatic vegetation sampling for Pools 4, 8, and 13 (Table 1)	31-Aug-2022				Lund, Carhart, Fopma
2022A5	Pool 4: Graphical summary and maps of aquatic vegetation current status and long-term trends.	30-Dec-2022				Lund
2022A6	Pool 8: Graphical summary and maps of aquatic vegetation current status and long-term trends.	30-Dec-2022				Carhart
2022A6	Pool 13: Graphical summary and maps of aquatic vegetation current status and long-term trends.	30-Dec-2022				Fopma
<b>Intended for distribution</b>						
Manuscript: Estimated annual summer submersed aquatic macrophyte standing stocks (1998 - 2018) in three large reaches of the Upper Mississippi River. (2020A8; accepted by <i>Journal of Fish and Wildlife Management</i> , IP-122160)						
<b>Fisheries Component</b>						
2022B1	Complete data entry, QA/QC of 2021 fish data; ~1,590 observations					
	a. Data entry completed and submission of data to USGS	31-Jan-2022		31-Jan-2022		DeLain, Dawald, Bartels, Hine, Kueter, Gittinger, West, Solomon, Maxson
	b. Data loaded on level 2 browsers; QA/QC scripts run and data corrections sent to Field Stations	15-Feb-2022		15-Feb-2022		Ickes, Schlifer
	c. Field Station QA/QC with corrections to USGS	15-Mar-2022		15-Mar-2022		DeLain, Dawald, Bartels, Kueter, Hine, Gittinger, West, Solomon, Maxson
	d. Corrections made and data moved to public Web Browser	30-Mar-2022		30-Mar-2022		Ickes and Schlifer

Upper Mississippi River Restoration  
Long Term Resource Monitoring Element  
FY2022 Base Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2022B2	Update Graphical Browser with 2021 data on Public Web Server.	31-May-2022				Ickes and Schlifer
2022B3	Complete fisheries sampling for Pools 4, 8, 13, 26, the Open River Reach, and La Grange Pool (Table 1)	31-Oct-2022				DeLain, Dawald, Bartels, Kueter, Hine, Gittinger, West, Solomon, Maxson
2022B4	IDNR Fisheries Management State Report: Fisheries Monitoring in Pool 13, Upper Mississippi River, 2020-2021	30-Jun-2022				Kueter
2022B5	Sample collection, database increment on Asian carp age and growth: collection of cleithral bones	31-Jan-2022		31-Jan-2022		Solomon, Maxson
2022B8(D)	Database increment: Stratified random day electrofishing samples collected in Pools 9–11	30-Sep-2022				Kueter
2022B9(D)	Database increment: Stratified random day electrofishing samples collected in Pools 16–18	30-Sep-2022				Kueter
<b>Intended for distribution</b>						
LTRM Completion report, compilation of 3 years of sampling: Fisheries (2009R1Fish; Chick et al.) <i>(in USGS review; minor grammatical corrections needed then will be posted on LTRM Fish page)</i>						
Manuscript: A synthesis on river floodplain connectivity and lateral fish passage in the Upper Mississippi River <i>(2021B11; Submitted to USGS review; IP-123678)</i>						
LTRM Fact Sheet: Tree map tool for visualizing fish data, with example of native versus non-native fish biomass (2013B16) <i>(Programming code for TreeMap being re-written; once completed Fact Sheet will be completed)</i>						
<b>Water Quality Component</b>						
2022D1	Complete calendar year 2021 fixed-site and SRS water quality sampling	31-Dec-2021		31-Dec-2021		Jankowski, Burdis, Kalas, Johnson, L. Gittinger, Kellerhals, Sobotka
2022D2	Complete laboratory sample analysis of 2021 fixed site and SRS data; Laboratory data loaded to Oracle data base.	15-Mar-2022		15-Mar-2022		Yuan, Schlifer
2022D3	1st Quarter of laboratory sample analysis (~12,600)	30-Dec-2021		30-Dec-2021		Yuan, Manier, Burdis, Kalas, Johnson, L. Gittinger, Cook, Sobotka
2022D4	2nd Quarter of laboratory sample analysis (~12,600)	30-Mar-2022		30-Mar-2022		Yuan, Manier, Burdis, Kalas, Johnson, L. Gittinger, Kellerhals, Sobotka
2022D5	3rd Quarter of laboratory sample analysis (~12,600)	29-Jun-2022				Yuan, Manier, Burdis, Kalas, Johnson, L. Gittinger, Kellerhals, Sobotka
2022D6	4th Quarter of laboratory sample analysis (~12,600)	28-Sep-2022				Yuan, Manier, Burdis, Kalas, Johnson, L. Gittinger, Kellerhals, Sobotka
2022D7	Complete QA/QC of calendar year 2021 fixed-site and SRS data.					

Upper Mississippi River Restoration  
Long Term Resource Monitoring Element  
FY2022 Base Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
	a. Data loaded on level 2 browsers; QA/QC scripts run; SAS QA/QC programs updated and sent to Field Stations with data.	30-Mar-2022		30-Mar-2022		Schlifer, Jankowski
	b. Field Station QA/QC; USGS QA/QC.	15-Apr-2022		15-Apr-2022		Jankowski, Burdis, Kalas, Johnson, L. Gittinger, Kellerhals, Sobotka
	c. Corrections made and data moved to public Web Browser	30-Apr-2022				Schlifer, Jankowski
2022D8	Complete FY2020 fixed site and SRS sampling for Pools 4, 8, 13, 26, Open River Reach, and La Grange Pool	30-Sep-2022				Jankowski, Burdis, Kalas, Johnson, L. Gittinger, Kellerhals, Sobotka
2022D9	WEB-based annual Water Quality Component Update w/2021 data on Server.	30-May-2022				Schlifer, Jankowski
2022D10	Operational Support to the UMRR LTRM Element. Serve as in-house Field Station for USGS for consultation and support on various LTRM-wide topics	30-Sep-2022				Kalas, Hoff, Bartel, Carhart
<b>On-Going</b>						
2019D12	Draft LTRM Completion Report: Assessment of Phytoplankton Samples collected by the Upper Mississippi River Restoration Program-Long Term Resource Monitoring Water Quality Component	30-Dec-2019	30-Jun-2022		Lead (Fulgoni) took new position	Jankowski
2020D12	Final LTRM Completion Report: Assessment of Phytoplankton Samples collected by the Upper Mississippi River Restoration Program-Long Term Resource Monitoring Water Quality Component	30-Mar-2021	30-Dec-2022			Jankowski
<b>Intended for distribution</b>						
Completion report, compilation of 3 years of sampling: Water Quality (2009R1WQ; Giblin, Burdis) (in USGS review; minor grammatical corrections needed then will be posted on LTRM WQ page)						
Manuscript: Nutrients and dissolved oxygen in the UMRS: improving our understanding of winter conditions and their implications for structure and function of the river (2014D12; Houser) (under revision)						
<b>Spatial Data Component</b>						
2022SD1	Orthorectification of scanned photos (Rock Island District - Mississippi River)	30-Sep-2022				Strange
2022SD2	Flight Plan Content/Data Pack	31-Dec-2021		31-Dec-2021		Finley
2022SD3	Fact Sheet or website text on UAS Rapid Response Imaging	30-Jun-2022				Finley
2022SD4	Aerial Thermal Application Completion Report	30-Sep-2022				Finley
2022SD5	Spatial Point Repository Tool of UMRS	30-Sep-2022				Finley
2022SD7	Pattern of Wild Rice Colonization and Retreat Dataset	30-Sep-2022				Finley
2022SD8	Maintenance ArcGIS server	30-Sep-2022				Fox, Rohweder

Upper Mississippi River Restoration  
Long Term Resource Monitoring Element  
FY2022 Base Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2022SD9	3D Digital Environment from Aerial Imagery using Structure from Motion Workflow Documentation (Job aid)	31-Mar-2022		31-Mar-2022		Finley
2022LD10	Active Remote Sensing Capability Addition to Crewed Aerial Survey Assets 2022	30-Jun-2022				Finley
2022SD11	Draft Report: Report to Congress Sections	30-Sep-2022				De Jager
2022SD12	Data Set: Land Cover Change in the UMRS Key Pools 1989-2020	30-Sep-2022				De Jager
2022SD13	Final 3D Vegetation Mapping Solution SOP (draft 2021SD2)	31-Mar-2022			delayed due to shortages of hardware (chips and graphics devices)	Finley
2022SD14	Survey Capability and Historic Spatial Database for LCU Mapping in-house report (draft 2021D6)	31-Mar-2022		31-Mar-2022		Finley
<b>On-Going</b>						
2021SD7	Topobathy strategic plan	30-Sep-2022				Strange, De Jager
2021SD10	Draft Report: Evaluating effects of alternative flooding scenarios on forest succession and landcover in the UMRS.	30-Sep-2021	30-Sep-2022		Changing to a manuscript	De Jager
<b>Data Management</b>						
2022M1	Update vegetation, fisheries, and water quality component field data entry and correction applications.	30-May-2022				Schlifer
2022M2	Load 2020 component sampling data into Database tables and make data available on Level 2 browsers for field stations to QA/QC.	30-Jun-2022				Schlifer
2022M3	Assist LTRM Staff with development and review of metadata and databases in conjunction with publishing of reports and manuscripts	On-going				Schlifer
<b>Status and Trends 3rd edition</b>						
2021ST3	Revised draft to UMESC Center Director and USGS Bureau Approving Official	23-Apr-2021	21-Feb-2022	30-Mar-2022	Edit text and figures received by USGS Publishing network; final author review on-going	All
2021ST4	Final publication	28-May-2022				All
2020ST4	Draft S&T3 Fact Sheet	TBD			Tied to completion of S&T3	All
<b>Equipment Inventory</b>						
2021ER1	Property inventory and tracking	15-Nov-2022				LTRM staff as needed



Upper Mississippi River Restoration  
 Long Term Resource Monitoring Element  
 FY2022 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
<b>Developing and Applying Indicators of Ecosystem Resilience to the UMRS</b>						
2022R1	Updates provided at quarterly UMRR CC meeting and	Various				Bouska, Houser
2022R2	Submit manuscript that investigates associations between general and specified resilience for peer review publication	30-Sep-2022				Bouska
<b>On-Going</b>						
2021R3	Submit resilience assessment synthesis manuscript for peer review publication	30-Mar-2021	30-Sep-2022			Bouska
2021R4	Submit resilience assessment synthesis fact sheet for	30-Sep-2021	30-Sep-2022			Bouska
2021R5	Submit manuscript that investigates associations between general and specified resilience for peer review publication	30-Sep-2021	31-Dec-2021	31-Dec-2021	Changed from manuscript that investigates associations between general and specified resilience in FY21	Bouska
<b>Landscape Pattern Research and Application</b>						
2022LP1	Data Analysis: 2020 Land Cover Change					Rohweder and De Jager
2022LP2	Data Analysis: Reed canary grass habitat suitability modeling using forestry data, flood inundation metrics, and landscape patterns.	30-Sep-2022				Delaney and Rohweder
2022LP3	Draft Report: Reed canary grass habitat suitability modeling using forestry data, flood inundation metrics, and landscape patterns.	30-Sep-2022				Delaney, De Jager, Van Appledorn, Bouska, Rohweder
<b>On-Going</b>						
2021LP4	Data Development: Developing seasonal aquatic areas maps to support aquatic habitat mapping and	30-Sep-2021	30-Sep-2022			Rohweder
2021LP1	Geospatial analyses in support of the Forest Gap project	30-Aug-2021	30-Sep-2022		Field work for analysis delayed due to Covid-19	Rohweder
Manuscript: Review of Landscape Ecology on the UMR; De Jager; 2016L3						
<b>Eco-hydrologic Research</b>						
2022EH1	Spatial analyses of backwater sedimentation patterns through time to support vulnerability	30-Sep-2022				Van Appledorn, Rohweder, DeJager
2022EH2	Characterization of hydrologic/flooding regimes of non-forested areas to support eco-hydrologic modeling efforts	30-Sep-2022				Van Appledorn

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
<b>On-Going</b>						
2020EH02	Submit manuscript of temporal patterns in UMRS inundation regimes for peer review	30-Sep-2021	30-Sep-22		Delayed due to ST3 priority switch	Van Appledorn, De Jager, Rohweder
2021EH01	Draft manuscript of temporal and spatial trends of large wood in the UMRS and potential eco-hydrologic drivers	30-Sep-2021	14-Jun-22			Van Appledorn, Jankowski
2021EH02	Draft manuscript of UMRS floodplain forest classification	30-Sep-2021	30-Jun-22			Van Appledorn, De Jager
Development of UMRS inundation model query tool; Van Appledorn, Fox, Rohweder, De Jager; 2019EH03						
Manuscript: Van Appledorn, M., De Jager, N.R. Considerations for improving floodplain research and management by integrating inundation modeling, ecosystem studies, and ecosystem services (2016L5; see 2019EH01) <b>(Resubmitted to journal after revisions)</b>						
<b>Intended for distribution</b>						
Manuscript: Modeling and mapping inundation regimes for ecological and management applications: a case study of the Upper Mississippi River floodplain, USA; Van Appledorn, De Jager, Rohweder <b>Research and Applications, Early View On-Line Special Edition.</b> <a href="http://dx.doi.org/10.1002/rra.3628">http://dx.doi.org/10.1002/rra.3628</a> Location of supporting data: <a href="https://doi.org/10.5066/F7VD6XRT">https://doi.org/10.5066/F7VD6XRT</a>						
<b>Acquisition and Interpretation of Imagery for Production of 2020 UMRS Land Cover/Land Use Data and Pool-Based Orthomosaics</b>						
2020LCU3	Image processing, stereo model development, orthorectification, pool-based mosaicking, image interpretation, automation, QA/QC, and serving of 2020 LCU datasets for remaining 50% of Open River South, the Alton Pool of the Illinois River, and Pools 9-12	1-Sep-2022				Dieck, Strassman
<b>Aquatic Vegetation, Fisheries, and Water Quality Research</b>						
<b>Intended for Distribution</b>						
Manuscript: Evidence of functionally defined non-random fish community responses over 25 years in a large river system (Ickes; 2019B13 replacing 2015B17 and 2016B17; <b>(Not accepted at journal, resubmitting to Hydrobiologia)</b>						
Manuscript: The ecology of ice across the river continuum (New tracking number 2021RC1) <b>Sharma, S., Meyer, M.F., Culpepper, J., Yang, X., Hampton, S., Berger, S.A., Brousil, M.R., Fradkin, S.C., Higgins, S.N., Jankowski, K.J., Kirillin, G., Smits, A.P., Whitaker, E.C., Yousef, F., Zhang, S. 2020. Integrating Perspectives to Understand Lake Ice Dynamics in a Changing World. Journal of Geophysical Research: Biogeosciences. 125: e2020JG005799.</b>						
Manuscript: Warmer winters increase phytoplankton biomass in a large floodplain river. <b>Jankowski, K. J., J. N.Houser, M. D. Scheuerell, and A. P. Smits. 2021. Warmer winters increase the biomass of phytoplankton in a large floodplain river. Journal of Geophysical Research: Biogeosciences. Volume 126, Issue 9. <a href="https://doi.org/10.1029/2020JG006135">https://doi.org/10.1029/2020JG006135</a>. Data available at: <a href="https://umesc.usgs.gov/data_library/water_quality/water_quality_page.html">https://umesc.usgs.gov/data_library/water_quality/water_quality_page.html</a></b>						
<b>Statistical Evaluation</b>						
<b>Intended for distribution</b>						
Manuscript: Inferring decreases in among- backwater heterogeneity in large rivers using among-backwater variation in limnological variables <b>(2010E1; IP-027392; Gray; in journal review)</b>						
Manuscript: Model selection for ecological community data using tree shrinkage priors; Gray, Hefley, Zhang, Bouska; <b>(2017FA2; IP-111931; in revision with Ecological Applications)</b>						
Manuscript: Probabilities of detecting submersed aquatic vegetation species using a rake method may vary with biomass; 2020E1; <b>Completed; Aquatic Botany, 171:103375, <a href="https://doi.org/10.1016/j.aquabot.2021.103375">https://doi.org/10.1016/j.aquabot.2021.103375</a></b>						

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
<b>Pool 12 Overwintering HREP Adaptive Management Fisheries Response Monitoring</b>						
2022P13d	Age determination of bluegills	1-Feb-2022				Kueter
2022P13e	In-house project databases updated	31-Mar-2022				Kueter
2021P13f	Made available to program partners via Fish Mgmt. State report (2021B4) (2021 and 2021)	30-Sep-2021	30-Jun-2022			Kueter
<b>Pool 4 - Peterson Lake HREP Water Quality Monitoring – Pre and Post-Adaptive Management Evaluation</b>						
2022PL1	Summary letter: Describing 2022 monitoring and future work	Dec. 2022				Burdis, Lund
<b>Science Meeting</b>						
<b>FY18 Funded Science in Support of Restoration and Management Proposals</b>						
<b>Conceptual Model and Hierarchical Classification of Hydrogeomorphic Settings in the UMRS</b>						
2019CM4	GIS data base and query tool	31-Dec-2019	On-going		Prototype developed	Fitzpatrick, Hendrickson, Sawyer, Strange
2019CM5	Submit draft LTRM Completion report on hydrogeomorphic conceptual model and hierarchical	31-Dec-2019	30-Mar-2022			Fitzpatrick, Hendrickson, Sawyer, Strange
2019CM6	Submit Final LTRM Completion report on hydrogeomorphic conceptual model and hierarchical	30-Jun-2020	30-Dec-2022			Fitzpatrick, Hendrickson, Sawyer, Strange
<b>Water Exchange Rates and Change in UMRS Channels and Backwaters, 1980 to Present</b>						
2019WE4	Submit Final LTRM Completion Report	30-Mar-2020	30-Dec-2021			Hendrickson
<b>Intrinsic and extrinsic regulation of water clarity over a 950-km longitudinal gradient of the UMRS</b>						
2019IE3	Submit Draft manuscript	30-Mar-2020	30-Mar-23		PIs determined that to move forward biomass information is needed. Will continue work once biomass model complete. Original Lead author (Drake) resigned from WDNR.	Carhart and others
<b>Systemic analysis of hydrogeomorphic influences on native freshwater mussels</b>						
2019FM7	Complete statistical analyses and prepare geospatial	30-Sep-2021	30-Sep-2022	Delayed since lead technician who was to perform most of the analyses took a new position; new hire in place		Teresa Newton, Jason Rohweder
2019FM8	Draft LTRM completion report	30-Sep-2021	30-Sep-2022			Teresa Newton
2019FM9	Final LTRM completion report	30-Jan-2023				Teresa Newton
<b>Using dendrochronology to understand historical forest growth, stand development, and gap dynamics</b>						
2022DD1	Draft manuscript: Floodplain forest structure and the recent decline of <i>Carya illinoensis</i> (Wangenh.) K. Koch (northern pecan); Part 2	30-May-2022				Harley
2022DD2	Draft manuscript: Floodplain forest structure and the recent decline of <i>Carya illinoensis</i> (Wangenh.) K. Koch (northern pecan); Part 3	30-May-2022				Maxwell

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
<b>Forest canopy gap dynamics: quantifying forest gaps and understanding gap – level forest regeneration</b>						
Manuscript: Forest canopy gap dynamics: quantifying forest gaps and understanding gap - level forest regeneration in Upper Mississippi River floodplain forests (2019FG5, MEIER et al.); Gap data found at: <a href="https://www.sciencebase.gov/catalog/item/5f3299a682cee144fb30dd02">https://www.sciencebase.gov/catalog/item/5f3299a682cee144fb30dd02</a>						
<b>Investigating vital rate drivers of UMRS fishes to support management and restoration</b>						
2019VR8	Data set complete (data delivered to Ben Schlifer, physical structures delivered to BRWFS)	30-Sep-2021	30-Mar-22		Pandemic has slowed progress on many aspects of age and growth. Closed labs, buildings and limited employees. Wrapping up on QA/QC on ages and wrapping up the last couple otoliths left.	Quinton Phelps
<b>On-Going</b>						
2019VR10	Submit draft manuscript (Drivers of vital rates)	31-Dec-2021	30-Jun-22			Quinton Phelps, Kristen Bouska
2019VR11	Submit draft manuscript (Microchemistry)	31-Dec-2021	30-Jun-22			Greg Whitledge
<b>Intended for distribution</b>						
Manuscript: vital rates of Channel Catfish, led by Colby Gainer (MS student) in review with the North American Journal of Fisheries Management; 2019VR9						
<b>FY19 Funded Science in Support of Restoration and Management</b>						
<b>Development of a standardized monitoring program for vegetation and fish response to Environmental Pool Management practices in the Upper Mississippi River System</b>						
2019epm3/4	Thesis by Courtney Weldon (formerly LTRM Completion Report)	30-Jun-2021	30-Jun-22		Field work delayed due to Covid-19 protocols and high water	Weldon, Chick, and Richter
<b>Combining genetics, otolith microchemistry, and vital rate estimation to inform restoration and management of fish populations in the UMRS</b>						
<b>Intended for distribution</b>						
Manuscript documenting the findings from genetic analyses of the six regional species has been accepted to the journal Molecular Ecology; Dr. Yue Shi						
<b>Reforesting UMRS forest canopy openings occupied by invasive species</b>						
2019ref3	Draft LTRM Completion	30-Apr-2021	30-Dec-22			Guyon and Cosgriff
2019ref4	Final LTRM Completion	30-Sep-2021	30-Jun-23			Guyon and Cosgriff
<b>A year of zooplankton community data from the habitats and pools of the UMR</b>						
2019zoo2	Draft LTRM Completion report on utility of zooplankton community monitoring for HREP assessment	30-Dec-2020	TBD	Sample collection delayed because of Covid-19 state protocols; zooplankton ID delayed; Fulgoni took new position		Sobotka
2019zoo3	Final LTRM Completion report on utility of zooplankton community monitoring for HREP assessment	30-Jun-2021	TBD			Sobotka
2019zoo4	Draft LTRM Completion report on detailing differences between pools and habitats. Report will also investigate the potential impacts of Asian carp on the zooplankton community.	30-Dec-2020	TBD			Sobotka
2019zoo5	Final LTRM Completion report on on detailing differences between pools and habitats. Report will also investigate the potential impacts of Asian carp on the	30-Jun-2021	TBD			Sobotka

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
<b>FY19 Funded Illinois Waterway 2020 Lock Closure</b>						
<b>Pre- and Post-Maintenance Aerial Imagery for Illinois River's Alton through Brandon Lock and Dams, 2019-2021.</b>						
2022IWW	Complete the imagery review and reporting	30-Aug-2022				Strassman
<b>Fish Community Response to the 2020 Illinois Waterway Lock Closure</b>						
2022FSH1	Draft Manuscript: Fisheries and WQ	31-Dec-22				Lamer
<b>FY20 Funded Science in Support of Restoration and Management</b>						
<b>Mapping Potential Sensitivity to Hydrogeomorphic Change in the UMRS Riverscape and Development of Supporting GIS Database and Query Tool</b>						
2021HG5	Complete annual project summary	31-Dec-2021	30-Mar-22			Strange, Fitzpatrick
2021HG6	Submit draft LTRM Completion report on hydrogeomorphic change GIS database and query system	31-Dec-2021	30-Sep-22			Vaughn, Strange, Fitzpatrick, Van Appledorn, USACE core team
2021HG7	Submit Final LTRM Completion report on hydrogeomorphic change GIS database and query tool.	30-Mar-2022	31-Dec-22			Vaughn, Strange, Fitzpatrick, Van Appledorn, USACE core team
<b>Improving our understanding of historic, contemporary, and future UMRS hydrology by improving workflows, reducing redundancies, and setting a blueprint for modelling potential future</b>						
2021HH1	Historic and Contemporary Hydrologic Database Release and Documentation	30-Sep-2021	30-Sep-22	Awaiting final data delivery from USACE Water Control Chiefs (2 of 3 districts have submitted historic data and documentation; 1 district has submitted documentation only); awaiting USACE hydrologic data server switch completion for accessing contemporary data		M. Van Appledorn, L. Sawyer
2021HH2	Draft LTRM Completion Report: document database and documentation development steps, database capabilities, and quantitative summaries of the hydrologic regime through time	30-Dec-2021	31-July-2022	Dependent on data acquisition from USACE		M. Van Appledorn, L. Sawyer
2021HH3	Final LTRM Completion Report: document database and documentation development steps, database capabilities, and quantitative summaries of the	31-Mar-2022	30-Sept-2022			M. Van Appledorn, L. Sawyer
2021HH4	Developing Future Hydrologic Scenarios Workshop: topics include identify appropriate future climate and/or land-use scenarios for use in a UMRS watershed model, existing hydrologic modeling resources and capabilities, and logistics for completing a climate-changed hydrologic modeling	30-Dec-2021		27-Jan-2022		M. Van Appledorn, L. Sawyer

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2021HH5	Draft LTRM Completion Report (Scenarios): This report will serve as the blueprint for modeling future hydrology to be undertaken with future funding opportunities.	31-Mar-2022	30-June-2022		delayed due to science meeting priority switch and 1-month delay in completion of	M. Van Appledorn, L. Sawyer
2021HH6	Final LTRM Completion Report (Scenarios): This report will serve as the blueprint for modeling future hydrology to be undertaken with future funding	30-Jun-2022	30-Sept-2022			M. Van Appledorn, L. Sawyer
<b>Understanding physical and ecological differences among side channels of the Upper Mississippi River System</b>						
2021SC3	Manuscript on side channel classification scheme submitted for peer review	30-Sep-2022				Sobotka, Strange, Bouska, McCain, Theel
2021SC4	Final report on UMRR management implications submitted for USGS review	30-Sep-2022				Sobotka & McCain
2021SC5	Manuscript on benthic invertebrate associations with side channel characteristics submitted for USGS and peer review	30-May-2023				Sobotka & Vander Vorste
<b>Refining our Upper Mississippi River's ecosystem states framework</b>						
2021SS8	TDA Mapper, regime shifts	1-May-2022				Bungula, student, Larson
2021SS9	Draft the STM, share with stakeholders	1-Sep-2022				Larson
2021SS10	Technical report, vulnerability assessment tool, and	1-Sep-2022				All
<b>Augmenting the UMRR fish vital rates project with greater species representation for genetics and otolith microchemistry</b>						
2021VR3	Submit draft manuscript (genetics)	31-Dec-2022				Davis, Tan, Lamer
2021VR4	Submit draft manuscript (genetics -	31-Dec-2022				Davis, Tan, Lamer
2021VR5	Submit draft manuscript (constructing management	31-Dec-2022				Bartels, Bouska, Davis, Lamer, Larson, Phelps, Tan, Whitledge

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
<b>Functional UMRS fish community responses and their environmental associations in the face of a changing river: hydrologic variability, biological invasions, and habitat rehabilitation</b>						
2021FF2	Draft manuscript: "Has large scale ecosystem rehabilitation altered functional fish community expressions in the Upper Mississippi River	30-Sep-2021	30-Jun-2022			Ickes and Gatto
2021FF3	Draft Manuscript: "Why aren't bigheaded carps ( <i>Hypophthalmichthys</i> sp.) everywhere in the Upper Mississippi River System?"	30-Sep-2021	30-Sep-2022			Ickes and Gatto
<b>Understanding landscape-scale patterns in winter conditions in the Upper Mississippi River System</b>						
2021WL1	System wide spatial layers of habitat conditions	30-Sep-2022				Mooney, Dugan, Magee
2021WL2	Draft manuscript: Landscape scale controls on overwintering habitat in a large river	30-Sep-2022				Mooney, Dugan, Jankowski, Magee
2021WL3	Draft manuscript: Response of oxygen dynamics to	30-Sep-2023				Jankowski, Dugan, Burdis, Kalas, Kueter
2021WL4	Draft Manuscript: Patterns in sediment characteristics and oxygen demand across a winter	30-Sep-2023				Perner, Kreiling, Jankowski, Giblin
<b>Forest Response to Multiple Large-Scale Inundation Events</b>						
2021FR3	Technical Report	1-Jun-2022				Cosgriff, Guyon, De Jager

**UMRR Science in Support of Restoration and Management**  
**FY2014 and FY2015 Scopes of Work**  
**May 2022 Status**

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
<b>Plankton community dynamics in Lake Pepin</b>						
2015LPP1	Phytoplankton processing; species composition, biovolume	30-Dec-15		22-Oct-15		Burdis
2015LPP2	draft manuscript: Plankton community dynamics in Lake Pepin	30-Sep-16	30-Jun-22		good progress, presentations this fall	Burdis, Manier
<b>Predictive Aquatic Cover Type Model - Phase 2</b>						
2015AQ1	Develop 2-D hydraulic model of upper Pool 4	30-Sep-15		30-Sep-15		Libbey (MVP H&H)
2015AQ2	Apply model to Pool 4 and resolve discrepancies	31-Dec-15	31-Mar-16	31-Mar-16		Yin, Rogala
2015AQ3	Detailed summary of work for Phases I & II	31-Dec-15		NA	Work terminated with resignation of Dr. Yin. Danelle Larson will re-evaluate vegetation modeling in a future time frame	Sauer (for Yin), Rogala, Ingvalson



## **FY2022 UMRR Science Proposals Recommended for Funding**

Listed below are four proposals recommended by the UMRR LTRM management team for FY2022 Science in Support of Restoration and Management funding. These recommendations are based on assessments of the proposals by the A-Team (representatives of MN, WI, IA, IL, MO, and USFWS), USGS UMESC, and USACE. There were a total of 13 proposals developed following the FY22 UMRR Science Meeting. The criteria used to assess the proposals are provided at the end of this document.

Proposals not funded in FY2022 may be reconsidered in FY2023 pending an assessment of current information needs, available funding, and adequate revisions to address questions and concerns raised during the 2022 review process. These proposals address important topics but were not judged to be of higher priority than any of the recommended proposals and may need revision to be re-considered for funding. The document containing the full version of each of the recommended proposals can be found here: <https://umrba.org/document/umrr-coordinating-committee-fy22-science-proposals-funding>

### **Recommended Proposals:**

Evaluating the LOCA-VIC-mizuRoute hydrology data products for scientific and management applications in the UMRS

Assessing Forest Development Processes and Pathways in Floodplain Forests along the Upper Mississippi River using Dendrochronology

Assessing long term changes and spatial patterns in macroinvertebrates through standardized long-term monitoring

Putting LTRM's long-term phytoplankton archive to work to understand ecosystem transitions and improve methodological approaches

## Estimated Budgets

Proposal Title	Principal Investigator	USGS	SACE	State	CES	Total Estimated Budget
Evaluating the LOCA-VIC-mizuRoute hydrology data products for scientific and management applications in the UMRS	Lucie Sawyer (USACE), Molly Van Appledorn (USGS UMESC), John Delaney (USGS UMESC)	\$ 69,218	\$ 321,310	n		\$ 390,528
Putting LTRM's long-term phytoplankton archive to work to understand ecosystem transition and improve methodological approaches	James Larson (USGS UMESC), Kathi Jo Jakowski (USGS UMESC), Madeline Magee (WDNR), Jessica Fulgoni (Kentucky Wesleyan College), Nicole Ward (MDNR), Ashley Johnson (IDNR)	\$ 447,158	n			\$ 447,158
Assessing long-term changes and spatial patterns in macroinvertebrates through standardized long-term monitoring	Jim Lamer (INHS), Molly Sobotka (MDC), Levi Solomons (INHS), Kris Maxson (INHS), Shawngibi (WDNR), Scott Gritters (IDNR), Steve DeLair (MDNR), Ross Vander Vorste (UW-La Crosse)			\$ 687,851	n	\$ 687,851
Assessing Forest Development Processes and Pathways in Floodplain Forests along the Upper Mississippi River using Dendrochronology	Marcelina Wiłdmuller-Campio (University of Minnesota), Molly Van Appledorn (USGS UMESC), Andy Meier (USACE)	\$ 4,518	n		\$ 222,468	\$ 226,986

UMRR SCIE CE R S EV U TI D R KI G CRITERI

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Note that score for first criterion is double the weight of the subsequent three. Use only whole numbers for scoring (no decimals).

Total Score (sum of Scores 1 – 4): \_\_\_\_\_ (enter this number (or the avg of this number across reviewers in your agency) on the Scoring Spreadsheet)

1. How important is the proposed activity to advancing knowledge and understanding needed for managing and restoring the UMRS? Base your assessment of importance on how well the work address one or more 2020 Focal areas. Raw score (0 to 9): \_\_\_\_\_ X 2 =total score (0 to 18) \_\_\_\_\_ [Score 1].

- 0 Not important – unlikely to contribute to our understanding of any focal areas.
- 1 - 3 Somewhat Important –will likely make a small contribution to our understanding of at least one focal area.
- 4 – 6 Important but could be addressed at any time. Expected to make a significant contribution to our understanding of one or more 2020 Focal Areas. u
- 7 - 9 Very Important and should be addressed now. Expected to make a substantial contribution to our understanding of one or more 2020 Focal Areas and is addressing an urgent need or taking advantage of an unusual opportunity. u

2. Are the study objectives clear and realistically achievable? That is, has the problem or question to be addressed been clearly identified and are the research questions or hypotheses clearly stated. Score (0 to 9): \_\_\_\_ [Score 2]

- 0 Objectives (including questions or hypotheses to be addressed) are poorly described or unlikely to be achieved.
- 1 – 3 Objectives (including questions or hypotheses) are clearly identified but it is unclear the extent to which the proposed work will achieve them; little significant new information is likely to be obtained
- 4 – 6 Objectives (including questions or hypotheses) are clearly identified and are likely to be at least partially achieved, such that some significant new information is likely to be obtained. u
- 7 – 9 Objectives (including questions or hypotheses) are clearly identified and likely to be fully achieved such that substantial new information is expected to be obtained.

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3. Are the methods clearly described? Do the PIs and collaborators have the necessary expertise to conduct the work? Will the methods produce the data or information required to get effectively address project objectives?

Score (0 to 9): \_\_\_\_\_ [Score 3]

- 0 Methods are not clearly stated
- 1 – 3 Methods are clearly stated, but are not likely to produce needed data/information
- 4 – 6 Methods are clearly stated, but unclear how well the results will address specified objectives
- 7 – 9 Methods are clearly stated and likely to effectively address specified objectives

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4. What is the scale of the problem (even if tested or applied at a local scale)? Score (0 to 9): \_\_\_\_\_ [Score 4]

- 0 Local problem only
- 1 –3 Local problem with reach-wide generality or application
- 4 – 6 Reach-wide problem
- 7 – 9 Systemic problem, with great generality u

## **ATTACHMENT C**

### **Additional Items**

- **Future Meeting Schedule** *(C-1)*
- **Frequently Used Acronyms** *(C-2 to C-8)*

**QUARTERLY MEETINGS  
FUTURE MEETING SCHEDULE**

<b>AUGUST 2022</b>	
<u>Location to be determined</u>	
August 9	UMRBA Quarterly Meeting
August 10	UMRR Coordinating Committee Quarterly Meeting

<b>NOVEMBER 2022</b>	
<u>Location to be determined</u>	
November 15	UMRBA Quarterly Meeting
November 16	UMRR Coordinating Committee Quarterly Meeting

## Acronyms Frequently Used on the Upper Mississippi River System

AAR	After Action Report
A&E	Architecture and Engineering
ACRCC	Asian Carp Regional Coordinating Committee
AFB	Alternative Formulation Briefing
AHAG	Aquatic Habitat Appraisal Guide
AHRI	American Heritage Rivers Initiative
AIS	Aquatic Invasive Species
ALC	American Lands Conservancy
ALDU	Aquatic Life Designated Use(s)
AM	Adaptive Management
ANS	Aquatic Nuisance Species
AP	Advisory Panel
APE	Additional Program Element
ARRA	American Recovery and Reinvestment Act
ASA(CW)	Assistant Secretary of the Army for Civil Works
A-Team	Analysis Team
ATR	Agency Technical Review
AWI	America's Watershed Initiative
AWO	American Waterways Operators
AWQMN	Ambient Water Quality Monitoring Network
BA	Biological Assessment
BATIC	Build America Transportation Investment Center
BCOES	Bid-ability, Constructability, Operability, Environmental, Sustainability
BCR	Benefit-Cost Ratio
BMPs	Best Management Practices
BO	Biological Opinion
CAP	Continuing Authorities Program
CAWS	Chicago Area Waterways System
CCC	Commodity Credit Corporation
CCP	Comprehensive Conservation Plan
CEICA	Cost Effectiveness Incremental Cost Analysis
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	Cubic Feet Per Second
CG	Construction General
CIA	Computerized Inventory and Analysis
CMMP	Channel Maintenance Management Plan
COE	Corps of Engineers
COPT	Captain of the Port
CPUE	Catch Per Unit Effort
CRA	Continuing Resolution Authority
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program

CSP	Conservation Security Program
CUA	Cooperative Use Agreement
CWA	Clean Water Act
CY	Cubic Yards
DALS	Department of Agriculture and Land Stewardship
DED	Department of Economic Development
DEM	Digital Elevation Model
DET	District Ecological Team
DEWS	Drought Early Warning System
DMMP	Dredged Material Management Plan
DNR	Department of Natural Resources
DO	Dissolved Oxygen
DOA	Department of Agriculture
DOC	Department of Conservation
DOER	Dredging Operations and Environmental Research
DOT	Department of Transportation
DPR	Definite Project Report
DQC	District Quality Control/Quality Assurance
DSS	Decision Support System
EA	Environmental Assessment
ECC	Economics Coordinating Committee
EEC	Essential Ecosystem Characteristic
EIS	Environmental Impact Statement
EMAP	Environmental Monitoring and Assessment Program
EMAP-GRE	Environmental Monitoring and Assessment Program-Great Rivers Ecosystem
EMP	Environmental Management Program [Note: Former name of Upper Mississippi River Restoration Program.]
EMP-CC	Environmental Management Program Coordinating Committee
EO	Executive Order
EPA	Environmental Protection Agency
EPM	Environmental Pool Management
EPR	External Peer Review
EQIP	Environmental Quality Incentives Program
ER	Engineering Regulation
ERDC	Engineering Research & Development Center
ESA	Endangered Species Act
EWMN	Early Warning Monitoring Network
EWP	Emergency Watershed Protection Program
FACA	Federal Advisory Committee Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FDR	Flood Damage Reduction
FFS	Flow Frequency Study
FMG	Forest Management Geodatabase
FONSI	Finding of No Significant Impact
FRM	Flood Risk Management

FRST	Floodplain Restoration System Team
FSA	Farm Services Agency
FTE	Full Time Equivalent
FWCA	Fish & Wildlife Coordination Act
FWIC	Fish and Wildlife Interagency Committee
FWS	Fish and Wildlife Service
FWWG	Fish and Wildlife Work Group
FY	Fiscal Year
GAO	Government Accountability Office
GEIS	Generic Environmental Impact Statement
GI	General Investigations
GIS	Geographic Information System
GLC	Governors Liaison Committee
GLC	Great Lakes Commission
GLMRIS	Great Lakes and Mississippi River Interbasin Study
GPS	Global Positioning System
GREAT	Great River Environmental Action Team
GRP	Geographic Response Plan
H&H	Hydrology and Hydraulics
HAB	Harmful Algal Bloom
HEC-EFM	Hydrologic Engineering Center Ecosystems Function Model
HEC-RAS	Hydrologic Engineering Center River Analysis System
HEL	Highly Erodible Land
HEP	Habitat Evaluation Procedure
HNA	Habitat Needs Assessment
HPSF	HREP Planning and Sequencing Framework
HQUSACE	Headquarters, USACE
H.R.	House of Representatives
HREP	Habitat Rehabilitation and Enhancement Project
HSI	Habitat Suitability Index
HU	Habitat Unit
HUC	Hydrologic Unit Code
IBA	Important Bird Area
IBI	Index of Biological (Biotic) Integrity
IC	Incident Commander
ICS	Incident Command System
ICWP	Interstate Council on Water Policy
IDIQ	Indefinite Delivery/Indefinite Quantity
IEPR	Independent External Peer Review
IGE	Independent Government Estimate
IIA	Implementation Issues Assessment
IIFO	Illinois-Iowa Field Office (formerly RIFO - Rock Island Field Office)
ILP	Integrated License Process
IMTS	Inland Marine Transportation System
IPR	In-Progress Review



IRCC	Illinois River Coordinating Council
IRPT	Inland Rivers, Ports & Terminals
IRTC	Implementation Report to Congress
IRWG	Illinois River Work Group
ISA	Inland Sensitivity Atlas
IWR	Institute for Water Resources
IWRM	Integrated Water Resources Management
IWS	Integrated Water Science
IWTF	Inland Waterways Trust Fund
IWUB	Inland Waterways Users Board
IWW	Illinois Waterway
L&D	Lock(s) and Dam
LC/LU	Land Cover/Land Use
LDB	Left Descending Bank
LERRD	Lands, Easements, Rights-of-Way, Relocation of Utilities or Other Existing Structures, and Disposal Areas
LiDAR	Light Detection and Ranging
LMR	Lower Mississippi River
LMRCC	Lower Mississippi River Conservation Committee
LOI	Letter of Intent
LTRM	Long Term Resource Monitoring
M-35	Marine Highway 35
MAFC	Mid-America Freight Coalition
MARAD	U.S. Maritime Administration
MARC 2000	Midwest Area River Coalition 2000
MCAT	Mussel Community Assessment Tool
MICRA	Mississippi Interstate Cooperative Resource Association
MDM	Major subordinate command Decision Milestone
MIPR	Military Interdepartmental Purchase Request
MMR	Middle Mississippi River
MMRP	Middle Mississippi River Partnership
MNRG	Midwest Natural Resources Group
MOA	Memorandum of Agreement
MoRAST	Missouri River Association of States and Tribes
MOU	Memorandum of Understanding
MRAPS	Missouri River Authorized Purposes Study
MRBI	Mississippi River Basin (Healthy Watersheds) Initiative
MRC	Mississippi River Commission
MRCC	Mississippi River Connections Collaborative
MRCTI	Mississippi River Cities and Towns Initiative
MRRC	Mississippi River Research Consortium
MR&T	Mississippi River and Tributaries (project)
MSP	Minimum Sustainable Program
MVD	Mississippi Valley Division
MVP	St. Paul District
MVR	Rock Island District

MVS	St. Louis District
NAS	National Academies of Science
NAWQA	National Water Quality Assessment
NCP	National Contingency Plan
NIDIS	National Integrated Drought Information System (NOAA)
NEBA	Net Environmental Benefit Analysis
NECC	Navigation Environmental Coordination Committee
NED	National Economic Development
NEPA	National Environmental Policy Act
NESP	Navigation and Ecosystem Sustainability Program
NETS	Navigation Economic Technologies Program
NGO	Non-Governmental Organization
NGRREC	National Great Rivers Research and Education Center
NGWOS	Next Generation Water Observing System
NICC	Navigation Interests Coordinating Committee
NPDES	National Pollution Discharge Elimination System
NPS	Non-Point Source
NPS	National Park Service
NRC	National Research Council
NRCS	Natural Resources Conservation Service
NRDAR	Natural Resources Damage Assessment and Restoration
NRT	National Response Team
NSIP	National Streamflow Information Program
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
O&M	Operation and Maintenance
OHWM	Ordinary High Water Mark
OMB	Office of Management and Budget
OMRR&R	Operation, Maintenance, Repair, Rehabilitation, and Replacement
OPA	Oil Pollution Act of 1990
ORSANCO	Ohio River Valley Water Sanitation Commission
OSC	On-Scene Coordinator
OSE	Other Social Effects
OSIT	On Site Inspection Team
P3	Public-Private Partnerships
PA	Programmatic Agreement
PAS	Planning Assistance to States
P&G	Principles and Guidelines
P&R	Principles and Requirements
P&S	Plans and Specifications
P&S	Principles and Standards
PCA	Pollution Control Agency
PCA	Project Cooperation Agreement
PCX	Planning Center of Expertise
PDT	Project Delivery Team

PED	Preconstruction Engineering and Design
PgMP	Program Management Plan
PILT	Payments In Lieu of Taxes
PIR	Project Implementation Report
PL	Public Law
PMP	Project Management Plan
PORT	Public Outreach Team
PPA	Project Partnership Agreement
PPT	Program Planning Team
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RCP	Regional Contingency Plan
RCPP	Regional Conservation Partnership Program
RDB	Right Descending Bank
RED	Regional Economic Development
RIFO	Rock Island Field Office (now IIFO - Illinois-Iowa Field Office)
RM	River Mile
RP	Responsible Party
RPEDN	Regional Planning and Environment Division North
RPT	Reach Planning Team
RRAT	River Resources Action Team
RRCT	River Resources Coordinating Team
RRF	River Resources Forum
RRT	Regional Response Team
RST	Regional Support Team
RTC	Report to Congress
S.	Senate
SAV	Submersed Aquatic Vegetation
SDWA	Safe Drinking Water Act
SEMA	State Emergency Management Agency
SET	System Ecological Team
SMART	Specific, Measurable, Attainable, Risk Informed, Timely
SONS	Spill of National Significance
SOW	Scope of Work
SRF	State Revolving Fund
SWCD	Soil and Water Conservation District
T&E	Threatened and Endangered
TEUs	twenty-foot equivalent units
TIGER	Transportation Investment Generating Economic Recovery
TLP	Traditional License Process
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TSP	Tentatively selected plan
TSS	Total Suspended Solids
TVA	Tennessee Valley Authority

TWG	Technical Work Group
UMESC	Upper Midwest Environmental Sciences Center
UMIMRA	Upper Mississippi, Illinois, and Missouri Rivers Association
UMR	Upper Mississippi River
UMRBA	Upper Mississippi River Basin Association
UMRBC	Upper Mississippi River Basin Commission
UMRCC	Upper Mississippi River Conservation Committee
UMRCP	Upper Mississippi River Comprehensive Plan
UMR-IWW	Upper Mississippi River-Illinois Waterway
UMRNWFR	Upper Mississippi River National Wildlife and Fish Refuge
UMRR	Upper Mississippi River Restoration Program [Note: Formerly known as Environmental Management Program.]
UMRR CC	Upper Mississippi River Restoration Program Coordinating Committee
UMRS	Upper Mississippi River System
UMWA	Upper Mississippi Waterway Association
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VTC	Video Teleconference
WCI	Waterways Council, Inc.
WES	Waterways Experiment Station (replaced by ERDC)
WHAG	Wildlife Habitat Appraisal Guide
WHIP	Wildlife Habitat Incentives Program
WIIN	Water Infrastructure Improvements for the Nation Act
WLM	Water Level Management
WLMTF	Water Level Management Task Force
WQ	Water Quality
WQEC	Water Quality Executive Committee
WQTF	Water Quality Task Force
WQS	Water Quality Standard
WRDA	Water Resources Development Act
WRP	Wetlands Reserve Program
WRRDA	Water Resources Reform and Development Act