

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

**Upper Mississippi River Restoration Program
Coordinating Committee**

Quarterly Meeting

October 25, 2023

**Agenda
with
Background
and
Supporting Materials**

Upper Mississippi River Restoration Program Coordinating Committee

October 25, 2023

Agenda

Tuesday, October 24 Partner Quarterly Pre-Meetings

- 3:30 – 5:30 p.m. Corps of Engineers
3:30 – 5:30 p.m. Department of the Interior
3:30 – 5:30 p.m. States

Wednesday, October 25 UMRR Coordinating Committee Quarterly Meeting

Time	Attachment	Topic	Presenter
8:00 a.m.		Welcome and Introductions	Brian Chewning, USACE
8:05	A1-A16	Approval of Minutes of May 24, 2023 Meeting	
8:10		Regional Management and Partnership Collaboration <ul style="list-style-type: none">▪ FY 2023 Fiscal Update and FY 2024 Outlook▪ Environmental Justice▪ 2023 HREP Selection▪ Scoping Strategic Planning▪ Implementation Issues	Marshall Plumley, USACE
9:10	B1	Strategic Planning Exercise <ul style="list-style-type: none">▪ Brainstorm Strategic Issues Facing UMRR	All
10:10		Break	
10:20		Communications <ul style="list-style-type: none">▪ UMRR Communications Team▪ External Communications and Outreach Events	Rachel Perrine, USACE All
10:50		Program Reports <ul style="list-style-type: none">▪ Habitat Restoration District Reports– FY 23 HREP Accomplishments	Angela Deen, Julie Millhollin, Brian Markert, USACE
12:10 p.m.		Lunch	

(Continued on next page)

Wednesday, May 24 UMRR Coordinating Committee Quarterly Meeting

(Continued)

Time	Attachment	Topic	Presenter
1:10		Program Reports (Continued)	
	C1-C14	<ul style="list-style-type: none">▪ Long Term Resource Monitoring and Science<ul style="list-style-type: none">– LTRM FY 2023 4th Quarter Highlights– FY 23 LTRM Accomplishments– USACE LTRM Update– A-Team Report– LTRM Implementation Planning Update	<i>Jeff Houser, USGS</i> <i>Davi Michl, USACE</i> <i>Matt O'Hara, IL DNR</i> <i>Jeff Houser, USGS</i>
2:30 p.m.		Other Business	
	D1-D8	Future Meeting Schedule	<i>Brian Chewning, USACE</i>
2:40 p.m.		Adjourn	

ATTACHMENT A

Minutes of the August 9, 2023
UMRR Coordinating Committee Quarterly Meeting
(A-1 to A-16)

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

**August 9, 2023
Quarterly Meeting**

La Crosse, Wisconsin

Sabrina Chandler of the U.S. Fish and Wildlife Service called the meeting to order at 8:15 a.m. on August 9, 2023. UMRR Coordinating Committee representatives in attendance in-person were Jeff Houser (USGS), Chad Craycraft (IL DNR), Vanessa Perry (MN DNR), Jim Fischer (WI DNR), and Rich Vaughn (NRCS). Brian Chewning (USACE), Matt Vitello (MO DoC), and Randy Schultz (IA DNR) attended virtually. A complete list of attendees follows these minutes.

Minutes of the May 24, 2023 Meeting

Jim Fischer moved and Vanessa Perry seconded a motion to approve the draft minutes of the May 24, 2023 UMRR Coordinating Committee meeting as written. The motion carried unanimously.

Regional Management and Partnership Collaboration

FY 2023 Fiscal Update

Marshall Plumley reported that UMRR has obligated nearly \$45 million of its \$55 million FY 2023 appropriation, as of August 1, 2023. The program is on track to execute over 95 percent of its appropriated funds. Plumley said he has no concerns about the program's ability to obligate its available funds this year, noting that execution rate is an important metric for the program. Plumley expressed appreciation to the partnership for their effectiveness and commitment to the program. Col. Jesse Curry echoed Plumley's sentiments noting that the high execution rate garners attention from Congress and contributes to UMRR's continued funding.

FY 2024 Budget Outlook

Plumley reported that the President's FY 2024 budget and House and Senate Appropriations Committees' FY 2024 energy and water spending measures include \$55 million for UMRR. Plumley said this is the seventh consecutive year that the President's budget and House and Senate appropriations bills have all concurred. The final appropriation is not yet known.

The FY 2024 draft plan of work for UMRR at \$55 million is listed below; it is largely consistent with the FY 2023 program with the addition of regional project sequencing. The draft plan of work reflects efforts on 11 projects in feasibility and 12 projects in design or construction.

- Regional Administration and Program Efforts – \$1,675,000
 - Regional management – \$1,260,000
 - Program database – \$100,000
 - Program Support Contract – \$140,000
 - Public Outreach – \$50,000
 - Regional Project Sequencing – \$125,000

- Regional Science and Monitoring – \$15,325,000
 - Long term resource monitoring – \$5,500,000
 - Regional science in support of restoration – \$8,350,000
 - Regional science staff support – \$200,000
 - Habitat evaluation (split across three districts) – \$1,275,000
- Habitat Restoration – \$38,000,000
 - Rock Island District – \$11,150,000
 - St. Louis District – \$13,700,000
 - St. Paul District – \$13,050,000
 - Model certification – \$100,000

UMRR Ten-Year Plan

Plumley said the UMRR 10-year plan was updated to reflect small changes to project timelines for Green Island, Pool 12 Forestry, and Oakwood Bottoms HREPs. The Pool 18 Forestry HREP was added to the 10-year plan. A new MVS project is scheduled to start feasibility at the end of FY 2023.

Partnership

Plumley reported that, in mid-July 2023, a Corps boat conducting water quality monitoring experienced a mechanical failure that resulted in the crew being stranded. Corps staff reached out to the Iowa field station to request the boat be towed to shore to ensure staff safety. Plumley expressed appreciation to Seth Fopma and Dave Bierman for responding immediately and said it is an example of the many small benefits of a strong partnership.

Environmental Justice

Plumley reported that, at the June 28, 2023 Navigation and Ecosystem Sustainability Program (NESP) Coordinating Committee meeting, partners requested UMRR’s environmental justice approaches be coordinated with similar efforts anticipated through NESP. Plumley said that UMRR continues to consider how to incorporate environmental justice in HREP selection and planning. Plumley reported that, on July 11, 2023, the UMRR Program Planning Team (PPT), consisting of the UMRR Coordinating Committee, District HREP managers, and District River Team chairs, met to discuss updating the UMRR HREP fact sheet template to include preliminary information on disadvantaged communities.

Plumley also reported that, on August 2, 2023, the UMRR Communications and Outreach Team meeting included a presentation from Matt Jones from MVS on environmental justice communications efforts. Plumley said Corps staff can support endeavors to enhance tools or outreach capabilities on environmental justice and it will not be the sole responsibility of river teams. Col. Eric Swenson said that there are many tribal governments within MVP’s geography that have a deep connection to the river. Col. Swenson underscored the value of, and MVP’s priority for, tribal engagement. He emphasized that planning needs to be more inclusive of indigenous knowledge and culture, especially with regards to water resources, which many tribes consider to be sacred. Plumley agreed and explained that UMRR and NESP are working toward a programmatic agreement on cultural resources and project implementation. Plumley said the UMRR Coordinating Committee anticipates meeting in September 2023 to discuss next steps for incorporating environmental justice into the HREP selection process.

HREP Selection Process

Plumley said the UMRR Coordinating Committee has set a recurring schedule for HREP selection processes to be implemented every five years. He reported that, on July 11, 2023, the UMRR PPT met to coordinate the timeframe for the upcoming HREP selection process. The PPT primarily focused on aligning river teams' schedules with NESP requests to maximize efficient use of time. River teams are beginning to set schedules and prepare for workshops.

Plumley said the UMRR Coordinating Committee requested that river teams provide endorsed fact sheets by the third quarter of FY 2025 (Apr – Jun 2025) for implementation in FYs 2026 through 2030. Assuming stable funding of \$55 million, the program will need to initiate feasibility work on 12 HREPs from FY 2026 to FY 2030 to maintain habitat restoration progress and ensure an adequate number of projects in planning, design, and construction. If UMRR is appropriated more than \$55 million in that timeframe (up to the \$90 million annual appropriation authorization), UMRR will need to initiate more projects to achieve program stability at the higher funding level. Plumley noted that the seven approved fact sheets remain. New fact sheets are needed to ensure projects address current habitat needs and reflect partner priorities and sponsor capabilities. Plumley also acknowledged the value of having additional projects in the queue as a contingency in the event that a project is stalled.

Plumley said the goals of the HREP selection process remain as follows: to optimize investment in rehabilitation of fish and wildlife habitat, address UMRS ecological needs at various scales, enhance public understanding and trust in decision-making, and retain necessary flexibility to ensure effective program execution and apply adaptive management principles to project planning, design, and implementation.

Plumley provided an overview of the guidance outlined in the HREP selection process in the UMRR Joint Charter of Consultative Bodies. The PPT agreed to provide the river teams with the following additional guidance beyond the process in the Charter, including:

- Project proposals that physically overlap with completed restoration efforts need to:
 - 1) clearly describe the changed ecological structure, function, and processes from when the prior project was completed, 2) describe the additional habitat benefits that will be gained over and above what was provided by the previous project, and 3) be coordinated with, and agreed upon by, the respective Corps District HREP Manager and the UMRR Regional Program Manager.
- Identify and describe (if applicable) opportunities for the project to address environmental justice criteria related to disadvantaged communities. Corps staff will be available to support this exercise and overall decision-making.

Plumley said the river teams will be asked to use the HNA-II indicators and other LTRM information (e.g., third ecological status and trends report) to develop project proposals, including defining habitat restoration needs and objectives. As a reference, UMRR has a published recording of a webinar overview of HNA-II, which is available online at the following link:

<https://usace.contentdm.oclc.org/utis/getfile/collection/p16021coll11/id/3834>. UMRR is preparing to host a webinar this fall on the 2022 Ecological Status and Trends of the Upper Mississippi and Illinois River Report. [Note: The webinar occurred on Thursday, September 7, 2023.]

In response to a question from Jim Fischer., Plumley explained that adding features to completed projects to increase resilience could be classified as adaptive management and, therefore, could be addressed through PERs. However, Plumley acknowledged that a programmatic discussion of adaptive management is needed to develop a path forward to address problems on existing projects. Fischer agreed and suggested including that explanation in presentations to the river teams. Plumley said he is scheduled to present to the FWFG at its meeting on August 10, 2023 and to other river teams in the coming months.

In response to a question from Vanessa Perry, Plumley said the Corps has created a GIS-based platform to understand the relationship of existing and future HREPs to disadvantaged communities (as defined by the White House Council on Environmental Quality's Climate and Economic Justice Screening Tool) by proximity. Plumley said the tool can help identify outreach opportunities to support project development.

While Perry expressed appreciation for environmental justice being included in project fact sheets, she put forward that proximity alone is not sufficient to evaluate how people are affected by an HREP. She encouraged interaction with communities to understand their current values and perceptions related to project locations and impacts from modifying those locations. Plumley agreed with Perry, recalling Col. Swenson's statements on the value of tribal engagement to improve water resource management.

As an example, Sabrina Chandler noted that the Pool 5 HREP triggered the proliferation of wild rice. In response, USFWS issued harvest permits to the Prairie Island Indian Community. Col. Curry encouraged the UMRR Coordinating Committee to focus on metrics of success for advancing environmental justice goals. Rather than focus on the number of projects, Col. Curry acknowledged the need to evaluate the impacts of those projects to people. He encouraged reaching out to communities identified as benefiting from existing projects to evaluate if and how those benefits have been realized. Plumley said he will share with the UMRR Coordinating Committee a recently released FAQ on environmental justice from USACE Headquarters.

Plumley said the PPT anticipates meeting in October 2023 to discuss updates from the river teams' processes and any adjustments or additional guidance that may be needed.

Strategic Plan Review

Plumley reported that, on July 5, 2023, the final UMRR 2015-2025 Strategic Plan Review Report was submitted via email to the Coordinating Committee. The report describes important partner insights. The report is available at the following link: <https://umrba.org/document/umrr-2015-2025-strategic-plan>. Plumley said the Coordinating Committee intends to use the report's findings to inform its priorities for UMRR in the near and long term, particularly as the Committee develops the program's next strategic plan. Jim Fischer expressed appreciation to all who worked on the report and specifically to Andrew Stephenson for developing the survey and report drafts.

Implementation Issues Assessment

Plumley reported that the UMRR Coordinating Committee met on May 24, 2023 to prioritize its top three or four implementation issues for it to focus attention on addressing or advancing in FY 2024. The group identified that the resolution of PPAs and federal easement lands are critical to long term execution of UMRR and that the issue of water level management has fundamentally changed since the issue paper was drafted – i.e., the construction new start and ongoing implementation of NESP and new authorization language in WRDA 2022.

The Coordinating Committee established small groups to develop a plan of action to address each implementation issue. Plumley said that Coordinating Committee members will meet on August 9, 2023 to discuss updates and priorities for FY 2024. Chad Craycraft said addressing PPA issues would allow many potential HREPs to be implemented. Plumley said UMRR cannot resolve the PPA issue but can identify the impacts of the issue as was done in the 2022 UMRR Report to Congress. Plumley said that PPAs are leaving otherwise available state funds inaccessible and that he is aware that UMRBA is working to address the PPA issue.

Report to Congress

ASA(CW) Michael Connor is reviewing the UMRR 2022 Report to Congress prior to transmitting it to Congress. Plumley said that he is responding to questions. The Corps is drafting a press release and four-page flyer that will be coordinated with the UMRR Communications and Outreach Team (COT) for distribution. Case studies on construction, science, and monitoring activities were developed for the report and can serve as a basis for future outreach efforts.

LTRM Program Manager Position

Plumley reported that the Corps completed interviews for the USACE LTRM Program Manager position and obtained an acceptance from a selected candidate. An announcement is anticipated at the end of August. [Note: On August 30, 2023, Plumley announced that Davi Michl will begin as the new USACE Long Term Resource Monitoring Project Manager on September 5, 2023.]

Outyear Funding Scenarios

Plumley reported that, on August 3, 2023, the UMRR Coordinating Committee convened a virtual meeting to discuss out-year funding scenarios, staffing plans, and programmatic priorities for FY 2024. Topics to frame the discussion included the existing portfolio of HREPs and LTRM activities, the pace of initiating new HREPs, partner capacity, additional WRDA changes, and inflation. Plumley said the Committee reviewed implementation scenarios over a long term timeframe at consistent funding levels of \$20 million, \$55 million, and \$90 million. Additional discussions are needed regarding expected staffing levels across agencies to support a higher appropriation and alleviate bottle necks.

UMRR HREP Workshop

Plumley said that a UMRR workshop for both HREP and LTRM personnel is anticipated for spring 2024. UMRBA staff will send a request for availability to UMRR Coordinating Committee members in August. A planning committee kickoff meeting is anticipated to be held in September. Potential workshop topics include monitoring and adaptive management, HREP/LTRM integration, HREP design handbook update, and HREP lessons learned among others.

UMRR Strategic Planning

Plumley said UMRR's next strategic planning process is scheduled to occur in FY 2024. He noted the process for developing the last strategic plan took over two years. Plumley said scoping the next strategic plan effort is anticipated to occur in fall 2023.

Communications

Status and Trends Flyers

Andrew Stephenson reported that the flyers that describe the condition and trends of the UMRS fisheries, floodplain forests, sedimentation, water quality, and aquatic vegetation developed from the most recent ecological status and trends report are now called snapshot summaries. UMRBA staff, in collaboration with the UMRR Communications and Outreach Team, developed a communication toolkit to help partner agencies distribute the snapshot summaries both internally and externally. The communication toolkit includes media pitch templates and two announcement templates to deliver snapshot summaries as well as contact information for media follow up and thumbnail photos relevant to each snapshot summary. High resolution images are available upon request.

The communications toolkit messaging focuses on the fact that record high water occurred in 2023 and UMRR is celebrating a milestone of 30 years of annual monitoring.

Stephenson said that, at the August 2, 2023 UMRR Communications and Outreach Team meeting, personnel from USACE, MN DNR, USGS, UMRBA, and the Mississippi River Network expressed a willingness to participate in coordinated messaging about the release of the snapshot summaries. Stephenson reported that Erin Spry presented to the Mississippi River Network's engagement committee on August 3, 2023, which led to discussion of environmental justice needs within communications efforts and the importance of inviting communities to speak for themselves.

Stephenson said the COT intends to learn from this process to inform any future strategies for using communications toolkits.

Vanessa Perry asked how snapshot summaries can be updated as new information is available. Stephenson said it may be appropriate to think about these summaries remaining relevant for a five-to-ten-year period and said new summaries could be created when the next Status and Trends report is published. Olivia Dorothy asked whether the UMRR Coordinating Committee intends to develop a summary of changing hydrology. Stephenson responded that the UMRR Coordinating Committee had considerable discussion about that and determined that the best approach was to weave changing hydrologic conditions as a thread into each snapshot summary.

Communication and Outreach Team Update

Rachel Perrine reported that the UMRR Communications and Outreach Team (COT) will focus on supporting a press release and flyer for the 2022 UMRR Report to Congress, preparing activities recognizing the 100th anniversary of the UMR National Wildlife and Fish Refuge in 2024, and distributing the ecological status and trends snapshot summaries using the communications toolkit. Perrine said the COT will hold additional future discussions on environmental justice communication.

This fall, the Team anticipates finalizing its framework for considering and developing communications activities as well as developing its priorities for work in FY 2024. Perrine said the COT framework covers membership of the COT, what it works on, and processes for completing work including social media campaigns, printable products, and more. Perrine requested that the UMRR Coordinating Committee send her comments on the COT framework, which is included as Attachment D of the meeting agenda packet, by August 31, 2023. Perrine said that Greg Husak, MN DNR, will present at the September COT meeting on lessons learned from MN DNR communications efforts. Perrine reported that Anne Wurtenberger, in Rock Island District, has taken on the role of co-coordinator for the COT with her.

External Communications and Outreach

Communication and outreach activities in the third quarter of FY 2023 include the following:

- Sabrina Chandler said that a recent Milwaukee Journal Sentinel article highlighted floodplain forest loss including at Reno Bottoms. The article had representation and interviews from many partners and was well-received locally and within USFWS. Angela Deen said the article also appeared in the Minneapolis Star Tribune. Col. Eric Swenson said USACE Headquarters shared the article on its news feed.
- Chandler said participants on the August 8, 2023 MICRA boat tour included many partner agencies and staffers from the offices of Sen. Ron Johnson and Sen. Chuck Grassley.
- Kirsten Wallace said Jeff Houser and Andrew Stephenson presented on LTRM water quality trends and macroinvertebrate sampling at the UMRBA joint Water Quality Executive

Committee and Water Quality Task Force Meeting. The discussion focused on monitoring infrastructure, collaboration, and leveraging resources to address overlapping interests and information needs.

- Chandler said she had had a visit from Rep. Mary Miller-Meeks regarding the Pool 13 HREP. She said there is significant interest on the project from Congress and state legislatures.
- Jim Fischer said he participated in the Wisconsin DNR’s Office of Communications’ supervisors fireside chat and was able to highlight UMRR. Fischer said Dr. Patrick Kelly also provided information on LTRM science monitoring at the Wisconsin field station. Fischer said he met with Wisconsin DNR’s non-point source coordinator regarding the Hypoxia Task Force and nutrient reduction strategy and highlighted UMRR and shared the Status and Trends snapshot summaries communication toolkit. Fischer said Wisconsin DNR has a new landing page for the Mississippi River and invited feedback.
- Andrew Stephenson said he will be presenting on the history and success of UMRR and the UMRS partnership in bringing resources to the region at a MICRA symposium at the American Fisheries Conference in Grand Rapids, Michigan on August 20-24, 2023.

Long Term Resource Monitoring and Science

FY 2023 3rd Quarter Report

Jeff Houser reported that accomplishments of the third quarter of FY 2023 include publication of the following manuscripts and completion report:

- *Reconstructing Missing Data by Comparing Interpolation Techniques: Applications for Long-Term Water Quality Data*
- *Quantifying Ecosystem States and State Transitions of the Upper Mississippi River System Using Topological Data Analysis*
- *Low-Complexity Floodplain Inundation Model Performs Well for Ecological and Management Applications in a Large River Ecosystem*
- *Upper Mississippi River Restoration Future Hydrology Meeting Series*

Houser reported that the LOCA-VIC-mizuRoute data product evaluation appears unsuitable for application in the Upper Mississippi River because it underestimated discharge and did not capture seasonal hydrographs. Houser said that a partnership workshop will be held in Spring 2024 to discuss results in-depth, reframe the purpose of the undertaking, and lay out next steps. Olivia Dorothy asked how the future hydrology meeting series relates to NOAA downscale climate modeling efforts. Kirsten Wallace said UMRBA is involved in and ensuring connection between both efforts. Wallace said USACE needs certain parameters to ensure models can be certified and that other basin efforts, such as a flow frequency study, may help inform downscale modeling outcomes for the greatest utility of the final product.

Houser reported that Molly Van Appledorn and Nate De Jager presented to the Society of Wetland Scientists on “Advancing the science and management of the Upper Mississippi River System floodplain by characterizing and mapping inundation regimes.” The purpose of the presentation was to convey the biophysical complexity of the UMRS floodplain, to demonstrate two methods of summarizing and mapping inundation, and to show how the work is integrated into management applications and the UMRR program.

Houser reported that UMRR convened a meeting on August 3-4, 2023 related to vital rates at the Kibbe Field Station. The purpose was to share findings and develop objectives and approaches for integrating project components.

Houser announced that the next UMRR Science Meeting will be held January 16-18, 2024 at UMESC. Two webinars will be held on September 25, 2023 and October 5, 2023 from 12-1:30 p.m. to update the partnership on recently completed and ongoing research projects that have been funded through UMRR science proposals.

Houser reported that the timeline to complete LC/LU dataset processing has been extended into FY 2026 due to staff departures. He said processing of Pool 17 will be moved forward due to ongoing study needs for floodplain forest. Processing of Pools 20 and 21 will be delayed accommodating Pool 17 advancement. The Upper Open River and ILWW will be processed in FY 2026.

In response to a question from Stephenson, Houser said that interviews have been conducted for the vacant UMRR Long Term Resource Monitoring (LTRM) Branch Chief position at UMESC. Houser anticipates announcing the candidate selection very soon.

Lower Pool 13 HREP Associated Research Project

Houser provided an overview of the Lower Pool 13 HREP Associated Research Project (HARP). Staff from USGS, IA DNR, USACE, and USFWS are collaborating on the project. Houser said the effort began with a brainstorming session at the 2022 UMRR Science Meeting to identify a portfolio of physical and ecological responses and interactions of importance in the Pool 13 project area. Physical drivers include sediment resuspension, upstream turbidity, substrate composition, and velocity. Ecological responses include aquatic vegetation and mussels. Houser explained the genesis of the Pool 13 HREP. In Pool 13, prevalence of submersed aquatic vegetation, especially wild celery, increased from 1998 to 2008 but has since declined. Water clarity in Pool 13 has exceeded criteria established for maximum TSS that permit submersed aquatic vegetation in more than half of years since 1994. Concerns regarding further loss of wild celery prompted natural resource managers to propose an HREP to improve conditions for submersed aquatic vegetation by altering water clarity and velocity. Additionally, resource managers recognized the opportunity to diversify flow and substrate characteristics in the project area to benefit mussels.

Houser said that four objectives were identified for the Lower Pool 13 HARP, including:

- Objective 1 - Pilot a radar wave monitoring system to measure existing (pre-project) wave conditions in Lower Pool 13
- Objective 2 - Evaluate relationships between wind, waves, and turbidity, and assess the relative contributions of upstream sources and local resuspension to turbidity in the project area
- Objective 3 - Assess spatial patterns and quantify relationships among wild celery, turbidity, and wave dynamics
- Objective 4 - Estimate substrate stability and population size, density, and species richness of mussels pre-project.

Houser said the Lower Pool 13 HARP will provide data products including baseline, pre-project information for post-construction assessments on the effects of specific project features as well as a minimum of four manuscripts on:

- Wind, wave, turbidity interactions
- Contributions of sediment resuspension and upstream delivery to local turbidity
- Spatial patterns in, and correspondence among, wave dynamics, turbidity, and aquatic vegetation
- Linkages between native freshwater mussel assemblages and substrate stability

Houser reported that, at its July 24, 2023 meeting, the A-Team recommended funding for all four objectives of the Lower Pool 13 HARP. Marshall Plumley said that at the 2019 UMRR planning and design workshop, there was intentional discussion regarding integration of the two program elements, HREP and LTRM. As a result, LTRM and field station staff were embedded in the Pool 13 HREP PDT, which provided the environment for new questions that had not previously been considered. Plumley said the Lower Pool 13 HARP is the fruition of intentional desire of the partnership to align program staff on one effort and that it has tremendous learning potential for this project and applicability to other areas. Plumley expressed appreciation for the team and partnership's support and effort on this project.

Houser requested the UMRR Coordinating Committee endorse funding for all four objectives as outlined on page E-26 of the meeting agenda packet. Olivia Dorothy asked if climate change was included in the scope of the project, noting that wind velocity is expected to increase with a warming climate. Kristen Bouska said this project will help improve our understanding of these relationships now but does not explicitly address climate change. Houser said that by studying impacts of wave direction and characteristics as well as the impacts of discharge on biological conditions, we may be able to better infer climate change impacts on these relationships. Plumley said HREP feasibility studies assess changing conditions related to flow and climate, which are incorporated into project designs. Sabrina Chandler USFWS is the project sponsor and is required to incorporate climate adaptation and resilience planning into project design.

Jim Fischer said that the Pool 13 HARP supports the 2015-2025 Strategic Plan goals and integrating science and restoration. Fisher moved and Chad Craycraft seconded a motion to endorse \$1,085,726 in funding to support implementation of all four objectives with \$827,886 coming from FY 2023 funds. The motion passed unanimously. Jeff Houser acknowledged the contributions of Bouska and others in developing the project, as well as mussel experts for high-speed mapping and the USACE Detroit District for information on the wave radar. Chandler said this will set a new standard for incorporating LTRM into HREPs and similar efforts are already underway in other PDTs.

USACE LTRM Report

Marshall Plumley said UMRR's LTRM FY 2023 budget allocation is \$7 million (\$5.5 million for base monitoring and \$1.5 million for analysis under base) with an additional \$6.85 million available for "science in support of restoration and management."

Plumley reviewed high priority funding items for science in support of restoration that were endorsed by the UMRR Coordinating Committee during or prior to the March 1, 2023 quarterly meeting totaling \$2,502,149 including:

- LTRM balance: \$331,508
- Ecohydrology: \$469,973
- LC processing (last year): \$335,238
- Vital Rates consolidated report: \$52,788
- Establishing an herbarium: \$21,649
- Macroinvertebrate contaminants: \$77,483
- Future landscape modeling: \$600,136
- Equipment (FS, UMESC): \$659,268
- Proposal adjustments: (\$45,894)

Plumley reviewed four priority FY 2022 science proposals totaling \$1,626,797 that were endorsed by the UMRR Coordinating Committee during the May 24, 2023 quarterly meeting including:

- Scoping and vetting new technology and methods for use in future hydrographic and topographic surveys
- Avian associations with management in the UMRS: filling knowledge gaps for habitat management

- Filling in the gaps with FLAMe: Spatial patterns in water quality and cyanobacteria across connectivity gradients and flow regimes in the Lower Impounded Reach of the UMR
- Substrate stability as an indicator of abiotic habitat for the UMR benthic community

Plumley said that the endorsed Pool 13 HARP, proposed initial work on two information needs, pending endorsement by the Coordinating Committee, and topobathy pilot studies (\$314,000) will utilize the remaining FY 2023 science in support funds totaling \$2,730,711. Plumley said no carryover LTRM funds are anticipated. The LTRM appropriation for FY 2024 is anticipated to be known by February 2024.

A-Team Report

Matt Vitello presented the A-Team update on behalf of Matt O'Hara. Vitello reported that the A-Team met on July 24, 2023. The A-Team congratulated Karen Hagerty for her years of service and upcoming retirement on July 31, 2023. Vitello said that Mark Gaikowski announced his promotion to USGS Deputy Regional Director for Science and said a permanent center director will be sought to fill his vacated position. In the interim, Jeff Houser will be the USGS representative for UMRR. Vitello reported that Karen Hagerty provided the HREP and LTRM programmatic updates and Jim Lamer provided an update on a framework to digitize and catalog otoliths collected through the vital rates project. Andrew Stephenson provided an update on the two-page snapshot summaries communicating the major findings from the 2022 UMRR LTRM status and trends report.

The A-Team suggested developing high and low water outreach flyers detailing the long term ecological impacts of historic significant hydrologic events. Bouska presented the updated Lower Pool 13 HARP proposal for the A-Team's endorsement. A-Team representatives unanimously voted to endorse all four proposal objectives. Vitello reported that a follow up meeting was held with Karen Hagerty, Jeff Houser and Matt O'Hara to discuss the proposal and A-team endorsement as well as clarify funding, staffing and timing of the project. Manish Pant updated the A-Team on data collection and data entry upgrades to the reinstated macroinvertebrate component. Three sampling techniques are being used to maximize efficiency of macroinvertebrate collection. Houser provide an update to the A-team regarding results of LTRM implementation planning including recommended information needs to address. With the proposals being funded in three-year segments, A-Team representatives will be provided more details as the proposals evolve with respect to staffing, funding expectations, and start and end dates of projects. Hagerty and Houser provided progress updates on critical USACE and USGS positions searches. Jennifer Dieck presented an update on the mapping and land cover land use project. Staffing issues have caused extended time to the mapping project.

Vitello said the next A-Team meeting will be virtual and is expected to be held in September or October 2023.

LTRM Implementation Planning

Houser reported that, over the past year, the *ad hoc* LTRM implementation planning team has drafted objective statements and identified and prioritized information needs using a structured decision-making process. The team considered the relevance of information needs to both ecosystem understanding and assessment as well as management and restoration along with the depth of current knowledge, cost, opportunity to learn, urgency, and unique capacity of LTRM to address the information need. The team explored various methods for optimizing expected benefits to costs over a 10-year funding period. The team selected a subset of information needs for additional development. For planning purposes, projects will be funded in three-year increments. Houser presented the *ad hoc* LTRM implementation planning team's recommended list of nine information needs for funding in FY 2024 to FY 2026, including:

- Floodplain ecology: Vegetation change across the system
- Floodplain ecology: Terrestrial and aquatic herpetofauna
- Hydrogeomorphic change: Geomorphic trends
- Aquatic ecology: Aquatic vegetation distribution and changes across the system
- Aquatic ecology: Native freshwater mussel distribution
- Aquatic ecology: Macroinvertebrate distribution
- Aquatic ecology: Lower trophic contribution (phyto- and zooplankton)
- Aquatic ecology: River gradients from Pool 14 to Pool 25
- Restoration applications: Learning from restoration and management

[Note: Full descriptions of the recommended information needs are included in pages E-27 to E-65 of the meeting agenda packet.]

Plumley expressed appreciation to the LTRM implementation planning team and to USGS for their leadership in the effort. He said this represents the most significant investment of time, since the establishment of LTRM, to think creatively about how to use potential resources to address information needs. This partnership effort sets the course and direction for LTRM for the next 10 years. Fischer agreed, expressed appreciation to Houser for leading the effort, and noted the approach was pragmatic, democratic, and inclusive. Fischer encouraged the UMRBA Board to review the information needs not currently being pursued as they consider WRDA 2024 priorities and potential advocacy for additional LTRM resources. Vanessa Perry expressed gratitude to the team as well and said this effort is complementary to the Strategic Plan review effort and will help guide future strategic planning. Perry moved and Fischer seconded a motion to endorse the recommended nine information needs for funding in FY 2024 to FY 2026. The motion passed unanimously.

Houser said the *ad hoc* LTRM implementation planning team will present a plan for how to most effectively fund each of the remaining information needs through FY 2026 to the UMRR Coordinating Committee in October 2023. The team recommended two of those information needs for initial funding with FY 2023 funds. Fischer moved and Chad Craycraft seconded a motion to partially fund the following two priority implementation planning science needs with FY 2023 funds totaling \$1,234,516:

- Hydrogeomorphic change: Geomorphic trends
- Aquatic ecology: River gradients from Pool 14 to Pool 25:

The motion passed unanimously. Sabrina Chandler expressed appreciation to the various entities involved and noted these information needs will significantly advance knowledge and restoration efforts on the river.

Habitat Restoration

Angela Deen reported that MVP has obligated 97 percent of its \$11 million FY 2023 funds, as of August 1, 2023. The District was able to fully fund McGregor Lake to construction completion and advance design for the Lower Pool 10 HREP through an AE firm. Deen reported that MVP's planning priorities include Big Lake – Pool 4 and Robinson Lake. The TSP milestone meeting for Big Lake – Pool 4 was held on July 21, 202 and concurrent agency and public report review is anticipated for fall 2023. Deen said Reno Bottoms is in the design phase with three stages in development. The PDT is discussing how to break up forestry work on the project. MVP awarded a design contract in June for Stages 1, 2, and 3 for Lower Pool 10 HREP. Deen reported that mussel surveys at Lower Pool 10's proposed access site detected Higgins' Eye mussels and the PDT is discussion other route options. Deen said that MVP has had three positive

experiences with an AE firm for design. McGregor Lake HREP Stage 1 construction is 95 percent complete, and Stage II was fully awarded. The project employs innovative techniques and beneficial use one-half million cubic yards of granular dredge material. Deen reported that Bass Ponds HREP, Conway Lake HREP, and Harpers Slough HREP have all been closed out and turned over to USFWS. A hydraulic analysis was completed for the Trempealeau Lake HREP, which is being re-evaluated to improve performance where harmful algal blooms have been problematic. In response to a question from Stephenson, Deen said that proposed construction of a culvert under railroad tracks at Trempealeau could improve gravity flow from the river and would be considered adaptive management on the existing HREP. New islands and bathymetric diversity objectives would be a new HREP fact sheet. In response to a question from Fischer, Deen said the monitoring plan will include both areas over a ten-year period.

Leo Keller reported that MVR's planning priorities include Pool 12 Forestry, Lower Pool 13 Phases 1 and 2, Green Island, and Quincy Bay HREPs. The Quincy Bay TSP meeting with MVD is scheduled for August 30, 2023. Keller said Pool 18 Forestry will be the next HREP to enter feasibility in MVR with a kickoff meeting in the fall. Steamboat Island Stage II remains in design and a contract is anticipated for early FY 2024. MVR has four projects in construction: Beaver Island Stage 1B, Steamboat Island Stage 1, Keithsburg Division Stages 1 and 2, and Huron Island Stage 3. Construction at Huron Island is complete; ERDC surveyed vegetation in June and 30 individuals from the Corps, USFWS, and Iowa DNR participated in additional plantings on July 18 and 19, 2023. An assessment of vegetation survival is anticipated to occur in September 2023. Deen said that a forestry multiple award task order contract (MATOC) was awarded on July 7. This contracting method covers timber stand improvement (TSI) including thinning and planting. PER site visits were completed for Spring Lake HREP, Huron Island HPER, and Pool 12 Overwintering. A PER site visit for Pool 11 Island HREP is scheduled for August 30, 2023. Plumley said that initial monitoring of innovative mussel substrate at Beaver Island has documented a positive response showing 20 different mussel species including some state threatened species. Plumley said the lessons learned from this mussel substrate feature can be incorporated into future island protection efforts. Chandler said she has had numerous conversations about the potential for this approach to be applied broadly and expressed appreciation for how this monitoring will inform future restoration efforts.

Brian Markert reported that Col. Andy Pannier is the new St. Louis District Commander. He said that Col. Pannier has a background in biology and is eager to attend the October 2023 UMRR Coordinating Committee meeting. Markert reported that MVS's planning priorities include West Alton Islands and Yorkinut Slough HREPs. Gilead Slough and Reds Landing HREPs were selected to start feasibility in the first quarter of FY 2024. Markert said the Swan Lake flood damage assessment letter report was approved in July and the Meredosia Island fact sheet endorsed by the UMRR Coordinating Committee at the May 24, 2023 quarterly meeting was approved by MVD. Markert reported that MVS's design priorities include Clarence Cannon Stage 4, Crains Island Stage 2, Harlow Island Stage 2, Oakwood Bottoms, and Swan Lake HREPs. MVS has three projects in construction: Crains Island Stage I, Piasa and Eagles Nest Stage II, and Clarence Cannon. The exterior berm (levee) setback at Clarence Cannon is substantially complete with seeding and reforestation to occur this fall. Markert said the contractor is on site at Piasa and Eagles Nest to survey and assemble and place pipe. In response to a question from Mark Ellis, Markert said that conditions at Clarence Cannon should not impact spill response planning in the area that is scheduled for late-August.

UMRR Showcase Presentations

Machine Learning to Evaluate Vulnerability and Restoration Potential of SAV

John Delaney, with USGS, presented on the use of explainable machine learning to evaluate vulnerability and restoration potential of submersed aquatic vegetation (SAV). He said the research goals were to determine 1) if a predictive model could be created to show where SAV occurs, 2) what predictor variables best explain SAV presence, 3) which sites have greater restoration potential, and what

environmental predictors could be manipulated to restore SAV at those sites, and 4) creating an online, interactive tool for researchers and managers to interact with model outputs. The study area included data from Pools 4, 8, and 13 and focused on presence or absence of SAV from 2010 to 2019, when SAV was stable. Ten predictor variables used in the model and identified through a workshop include:

- Water depth (m)
- Suspended solids (mg/L)
- Substrate (type)
- Distance to nearest SAV (m)
- Distance to main channel (m)
- Lentic connectivity (%)
- Weighted wind fetch (km)
- Chlorophyll a concentration (µg/L)
- Total nitrogen(mg/L)
- Previous 3-year summer low flow days (days)

Delaney said the random forest model was 89% accurate and the four most important variables were water depth, suspended solids, substrate, and distance to nearest SAV. Sample sites can be viewed individually to show locally important variables. Sites were classified as SAV present or SAV absent with a cutoff at a prediction probability of 0.5. Delaney said that prediction probabilities approaching 0.5 suggest increasing recovery potential or increased vulnerability to state changes. The online, interactive tool is available at the following link: <https://rconnect.usgs.gov/SAVVEA/>.

In response to a question from Chad Craycraft, Delaney said that no areas downstream of Pool 13 were included because the absence of SAV in those areas could influence the model. Danelle Larson added that there is little data beyond 2004 in those areas with the exception of UMRCC sampling. In response to a question from Vanessa Perry, Larson said she published a paper titled *Quantifying Ecosystem States and State Transitions of the Upper Mississippi River System Using Topological Data Analysis* that includes a multivariate analysis with 10 water quality variables. Jim Fischer applauded Delaney and Larson for their work and deeper analysis of LTRM datasets. Fischer asked if the model could be applied to non-key pools and if it could be used by resource managers in the next project selection process. Delaney said areas below Pool 13 may have variable values outside the range within the current model. Larson noted the three variables for habitat suitability: depth, turbidity, and substrate type or velocity could be affected by HREPs and could inform where projects may be needed and most effective. In response to a question from Houser, Larson provided Pool 13 as an example of where thresholds have been considered and variables projects could affect were identified to consider restoration potential. Fischer suggested including an overview of this tool as a webinar to inform the HREP selection process as it could lead to more resilient projects. Marshall Plumley said the models are very applicable, but that herbivory is not included in the current model. He noted that the Huron Island HREP shows that exclosures allow plants to reestablish in areas that may be outside model predictions.

Other Business

Sabrina Chandler said that, following the conclusion of the meeting, the UMRR Coordinating Committee and meeting participants were welcome to tour the recently renovated water quality analysis lab at UMESC.

Kirsten Wallace said that UMRBA has changed the format of calendar invitations for quarterly meetings. Wallace requested that any feedback regarding experiences with the new format be sent to UMRBA staff.

Upcoming quarterly meetings are as follows:

August 2023 – La Crosse

- UMRBA quarterly meeting – August 8
- UMRR Coordinating Committee quarterly meeting – August 9

October 2023 – St. Louis

- UMRBA quarterly meeting – October 24
- UMRB Coordinating Committee quarterly meeting – October 25

May 2024 – Quad Cities

- UMRBA quarterly meeting – May 21
- UMRB Coordinating Committee quarterly meeting – May 22

With no further business, Jim Fischer moved Chad Craycraft seconded a motion to adjourn the meeting. The motion carried unanimously. The meeting adjourned at 2:28 p.m.

UMRR Coordinating Committee Attendance List
May 24, 2022
[Note: This includes in-person and virtual attendees]

UMRR Coordinating Committee Members

Brian Chewning	U.S. Army Corps of Engineers
Sabrina Chandler	U.S. Fish and Wildlife Service
Jeff Houser	U.S. Geological Survey, UMESC
Chad Craycraft	Illinois Department of Natural Resources
Randy Schultz	Iowa Department of Natural Resources
Vanessa Perry	Minnesota Department of Natural Resources
Matt Vitello	Missouri Department of Conservation
Jim Fischer	Wisconsin Department of Natural Resources
Rich Vaughn	Natural Resources Conservation Service

Others In Attendance

Jim Cole	U.S. Army Corps of Engineers, MVD
Thatch Shepard	U.S. Army Corps of Engineers, MVD
Samantha Thompson	U.S. Army Corps of Engineers, MVD
LeeAnn Riggs	U.S. Army Corps of Engineers, MVD
Col. Eric Swenson	U.S. Army Corps of Engineers, MVP
Nathan Wallerstedt	U.S. Army Corps of Engineers, MVP
Angela Deen	U.S. Army Corps of Engineers, MVP
John Henderson	U.S. Army Corps of Engineers, MVP
Col. Jesse Curry	U.S. Army Corps of Engineers, MVR
Marshall Plumley	U.S. Army Corps of Engineers, MVR
Leo Keller	U.S. Army Corps of Engineers, MVR
Julie Millhollin	U.S. Army Corps of Engineers, MVR
Rachel Perrine	U.S. Army Corps of Engineers, MVR
Rachel Hawes	U.S. Army Corps of Engineers, MVR
Marisa Lack	U.S. Army Corps of Engineers, MVR
Jessie Dunton	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
Greg Kohler	U.S. Army Corps of Engineers, MVS
Elisabeth Lang	U.S. Environmental Protection Agency
Whitney King	U.S. Environmental Protection Agency
Kraig McPeck	U.S. Fish and Wildlife Service, IIFO
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
Laura Muzal	U.S. Fish and Wildlife Service
Alex Kasdin	U.S. Fish and Wildlife Service
Mary Stefanski	U.S. Fish and Wildlife Service, Refuges
Jennifer Dieck	U.S. Geological Survey, UMESC
Danelle Larson	U.S. Geological Survey, UMESC
KathiJo Jankowski	U.S. Geological Survey, UMESC
Kristen Bouska	U.S. Geological Survey, UMESC
John Delaney	U.S. Geological Survey, UMESC
JC Nelson	U.S. Geological Survey
Jenn Lacey	U.S. Geological Survey
Mark Gaikowski	U.S. Geological Survey

Rick Pohlman	Illinois Department of Natural Resources
Dave Glover	Illinois Department of Natural Resources
BJ Murray	Illinois Department of Transportation
Brian McCoy	Illinois Department of Transportation
Kirk Hansen	Iowa Department of Natural Resources
Dave Bierman	Iowa Department of Natural Resources
Travis Black	Maritime Administration
Nick Schlessler	Minnesota Department of Natural Resources
Kevin Stauffer	Minnesota Department of Natural Resources
Neil Rude	Minnesota Department of Natural Resources
Megan Moore	Minnesota Department of Natural Resources
Tim Anderson	Wisconsin Department of Agriculture, Trade and Consumer Protection
Scott Roepke	Wisconsin Department of Natural Resources
Jordan Weeks	Wisconsin Department of Natural Resources
Dave Rozeboom	Wisconsin Department of Natural Resources
Patrick Kelly	Wisconsin Department of Natural Resources
Olivia Dorothy	American Rivers
Kim Lutz	America's Watershed Initiative
Brent Newman	Audubon
Lindsay Brice	Audubon
Anshu Singh	Corn Belt Ports
Fritz Funk	Lake Onalaska District
Doug Daigle	Lower Mississippi River Sub-basin Committee
Rick Stoff	Stoff Communications
Karen Hagerty	Illinois Resident
Kirsten Wallace	Upper Mississippi River Basin Association
Brian Stenquist	Upper Mississippi River Basin Association
Andrew Stephenson	Upper Mississippi River Basin Association
Mark Ellis	Upper Mississippi River Basin Association
Ken Petersen	Upper Mississippi River Basin Association
Erin Spry	Upper Mississippi River Basin Association

ATTACHMENT B

Strategic Planning Exercise

- Overview of a Proposed UMRR Strategic Planning Process (*B-1*)

Purpose of the Strategic Planning Process:

1. To support the strategic management of the Upper Mississippi River Restoration Program (UMRR) by the UMRR Program Manager and the UMRR Coordinating Committee
2. Enhance the collaboration among the UMRR Program Manager, the UMRR Coordinating Committee, individuals and organizations actively engaged in UMRR activities, and individuals and organizations interested in and/or impacted by UMRR activities

Products of the Strategic Planning Process:

1. A Strategic Plan 2025-2035, which will include
 - Program Mission, Vision, Goals, Objectives, Strategies
 - A description of Strategic Issues that will impact the program and how the program will address those Strategic Issues
 - A description of how the Strategic Plan will be implemented and evaluated
2. Enhanced relationships among the individuals and organizations that participate in the strategic planning process

People involved in the Strategic Planning Process:

1. The UMRR Program Manager
2. The UMRR Coordinating Committee
3. A Strategic Planning Team (10-15 people actively engaged in design and discussion of the process and the plan)
4. A Strategic Planning Leadership Team (3-5 members of the Strategic Planning Team that will manage the process)
5. 1 or 2 Facilitators who will help the Leadership Team design and manage the various strategic planning meetings, discussions, feedback sessions, and events
6. Stakeholders, individuals, and organizations impacted by the UMRR and its Strategic Plan 2025-2035

The Process:

1. The strategic planning process will involve a series of meetings, discussions, feedback sessions, and events beginning in October 2023 and concluding in May 2025.
2. The process will use UMRR Quarterly meetings for exploration, discussion, review, and feedback on emerging ideas.
3. The Strategic Planning Team will meet in between the UMRR Quarterly meetings to develop additional information, explore ideas, and design the strategic planning discussion and feedback sessions that will be held during each Quarterly meeting.
4. The Strategic Planning Team may design additional discussions and feedback sessions necessary to develop an effective strategic plan with robust public participation.

Next Steps in the Strategic Planning Process:

1. Review, refine, and affirm a strategic planning process
2. Create a Strategic Planning Team and identify the Strategic Planning Leadership Team
3. Let the Strategic Planning Team design a process
4. Identify the strategic planning facilitators

ATTACHMENT C

Program Reports

- FY23 Milestones – Partial Update (October 2023) *(C-1 to C-14)*

[Note: This milestone table is being provided as a general overview of ongoing and completed FY23 work. Because of transitions and temporary vacancies in LTRM leadership personnel at USGS and USACE during FY23, these tables have not been fully updated to reflect the status of all projects as of the end of FY23. A fully updated FY23 milestone table will be included in the read ahead material for the February 2024 UMRR CC meeting. In the meantime, questions about specific milestones may be directed to Jeff Houser (jhouser@usgs.gov)

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Developing and Applying Indicators of Ecosystem Resilience to the UMRS						
2023R1	Updates provided at quarterly UMRR CC meeting and A team meeting as appropriate	Various				Bouska, Houser
2023R2	Develop collaborative research proposal and work plan to empirically test resilience hypotheses related to Lower Pool 13 HREP	30-May-2023		15-Jun-2023		Bouska
On-Going						
2021R3	Submit resilience assessment synthesis manuscript for peer review publication	30-Mar-2021	30-Sep-2023		Delayed due to change in priorities	Bouska
2021R4	Submit resilience assessment synthesis fact sheet for USGS peer review	30-Sep-2021	30-Sep-2023		Delayed due to change in priorities	Bouska
2022R2	Submit manuscript that investigates associations between general and specified resilience for peer review publication	30-Sep-2022	30-Sep-2023		Changed from manuscript that investigates associations between general and specified resilience in FY21	Bouska

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Landscape Pattern Research and Application						
2023LP1	Draft Report: 2020 Land Cover Change	30-Sep-2023	30-Nov-24		Initial rough draft is being revised	Rohweder and De Jager
2023LP2	Data Analysis: Thresholds analysis of Reed canary grass habitat suitability.	30-Sep-2023		2-Oct-2023	Dataset is approved for dissemination. Waiting to publicly release when manuscript is published.	Delaney and Rohweder
2023LP3	Draft Report: Thresholds analysis of Reed canary grass habitat suitability	30-Sep-2023	31-Jan-24		Manuscript is complete, waiting on center and BAO approval before submitting to journal. USGS approval process has taken longer than anticipated.	Delaney, De Jager, Van Appledorn, Bouska, Rohweder
2023 LP4	Data Analysis: Detecting decadal changes in RCG dominance in wet meadows	30-Sep-2023		31-Dec-2023	Data analysis is well underway but has taken longer than expected. We will be working on identifying additional data needs and summarizing results for a report or manuscript.	Delaney, De Jager, Van Appledorn, Bouska, Rohweder
2023LP5	Map Set: UMRS forest communities	30-Sep-2023		1-Jul-2023		Rohweder and De Jager
2023LP6	Map Set: Aquatic Areas	30-Sep-2023		partial	Pools 04, 08, 09, 12, 13, 26, Open River 2, and LaGrange have been through IPDS and are at dissemination but have not been uploaded to ScienceBase yet just due to backlog. Additional pools will be completed as the LCU layers are completed.	Ruhser, Rohweder, De Jager
On-Going						
Manuscript: Review of Landscape Ecology on the UMR 2016L3; in draft						
Intended for distribution						
Manuscript: Delaney, J.T., Van Appledorn, M., De Jager, N.R., Bouska, K.L., Rohweder, J.J. In Prep. Predicting <i>Phalaris arundinacea</i> (reed canarygrass) invasion in forest understories of the Upper Mississippi River floodplain. 2022LP3						

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Eco-hydrologic Research						
2023EH1	Draft report of backwater sedimentation patterns through time to support vulnerability modeling effort	30-Sep-2023	31-July-2024		Delayed due to maternity leave	Van Appledorn, Rohweder, DeJager, Kalas
2023EH2	Draft manuscript of reed canary grass, wood nettle, and silver maple seedling distributions and persistence in the UMR floodplain across environmental gradients	30-Sep-2023	31-July_2024		Delayed due to Kirsch retirement; R. Burner is now working will Van Appledorn to complete	Van Appledorn, Kirsch
On-Going						
2020EH02	Submit manuscript of temporal patterns in UMRS inundation regimes for peer review	30-Sep-2021	31-Dec-2024		Delayed due to change in priorities	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	30-Sep-2023	31-Aug-23	Submitted to IPDS 31 Aug 23	Van Appledorn, Jankowski
2021EH02	Draft manuscript of UMRS floodplain forest classification	30-Sep-2021	30-Sep-2023		Delayed due to change in priorities	Van Appledorn, De Jager
Intended for distribution						
Development of UMRS inundation model query tool; Van Appledorn, Fox, Rohweder, De Jager; 2019EH03						
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, Jason. (In revision with J Hydrology; IP-102710)						

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Acquisition and Interpretation of Imagery for Production of 2020 UMRS Land Cover/Land Use Data and Pool-Based Orthomosaics						
2023LCU3	Image processing, stereo model development, orthorectification, pool-based mosaicking, image interpretation, automation, QA/QC, and serving of 2020 LCU datasets for Pools 1-3, 7, 11, and 50% of Pool 10, the St. Croix and lower Minnesota Rivers, and the Alton Pool of the Illinois River	30-Sep-2023		partial; 30 Sep 2023	All steps for the 2023LCU3 milestone are complete for pools 10 and 11, with pools 07 and St. Croix complete except for public serving. Pools 01 - 03 (inclusive of the lower Minnesota River) are in the USGS formal review process (FSP) and are expected to complete the process in November. Alton Pool remains in the QA/QC step with expectations that it will enter FSP before the end of the calendar year	Dieck, Strassman
Aquatic Vegetation, Fisheries, and Water Quality Research, Statistical Evaluation						
Intended for Distribution						
Manuscript: Annual summer submersed macrophyte standing stocks estimated from long-term monitoring data in the Upper Mississippi River. (Completed; 2020A8; https://doi.org/10.3996/JFWM-21-063)						
On-Going						
Manuscript: Evidence of functionally defined non-random fish community responses over 25 years in a large river system (Ickes; 2019B13 replacing 2015B17 and 2016B17; Resubmitted to <i>Hydrobiologia</i> , IP-118040)						
Manuscript: A synthesis on river floodplain connectivity and lateral fish passage in the Upper Mississippi River, (Ickes; Submitted River Research and Applications, IP-123678)						
Statistical Evaluation						
Intended for distribution						
Manuscript: Inferring decreases in among-backwater heterogeneity in large rivers using among-backwater variation in limnological variables (2010E1; IP-027392; Gray; in journal review)						
Manuscript: How well do trends in LTRM percent frequency of occurrence SAV statistics track trends in true occurrence? (2016E2; IP-123221; Gray; in journal review)						
Manuscript: Model selection for ecological community data using tree shrinkage priors; Gray, Hefley, Zhang, Bouska; (2017FA2; IP-111931; in revision with <i>Ecological Applications</i> ; https://arxiv.org/abs/2005.14303)						
Pool 12 Overwintering HREP Adaptive Management Fisheries Response Monitoring						
2023P13d	Age determination of bluegills	1-Feb-2023		1-Feb-2023		Kueter
2023P13e	In-house project databases updated	31-Mar-2023		31-Mar-2023		Kueter
2023P13f	Made available to program partners via Iowa Fish Mgmt. State report	30-Jun-2023				Kueter
Pool 4 - Peterson Lake HREP Water Quality Monitoring – Pre and Post-Adaptive Management Evaluation						

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2022PL1	Summary letter: Describing 2022 monitoring and future work	30-Dec-2022				Burdis, Lund

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
FY18 Funded Science in Support of Restoration and Management Proposals						
Conceptual Model and Hierarchical Classification of Hydrogeomorphic Settings in the UMRS						
2019CM6	Submit Final LTRM Completion report on hydrogeomorphic conceptual model and hierarchical classification system	30-Jun-2020	30-Dec-2022			Fitzpatrick, Hendrickson, Sawyer, Strange
Water Exchange Rates and Change in UMRS Channels and Backwaters, 1980 to Present						
2019WE4	Submit Final LTRM Completion Report	30-Mar-2020	30-Dec-2023			Hendrickson
Intrinsic and extrinsic regulation of water clarity over a 950-km longitudinal gradient of the UMRS						
2019IE3	Submit Draft manuscript	30-Mar-2020	30-Sep-23	6.22.23-- submitted to Ecosystems Journal reviews received 18 Sept. Revised ms to be submitted by 30 Oct 2023	PIs determined that to move forward biomass information as needed. Will continue work once biomass model complete. Original Lead author (Drake) resigned from WDNR. Update 5/5/23: Currently undergoing final co-author review. Update 6.22.23 - submitted to	Carhart and others
Systemic analysis of hydrogeomorphic influences on native freshwater mussels						
2019FM9	Final LTRM completion report (changed to manuscript)	30-Jan-2023	23-Dec-2023		the lead PI took a different job in Sep 2022 without completing the MS	Teresa Newton
Using dendrochronology to understand historical forest growth, stand development, and gap dynamics						
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	TBD			Grant Harley (U Idaho), Ben Van der Myde (USACE contact)
Forest canopy gap dynamics: quantifying forest gaps and understanding gap – level forest regeneration						
2019FG5	Draft Manuscript: Forest canopy gap dynamics: quantifying forest gaps and understanding gap - level forest regeneration in Upper Mississippi River floodplain forests	30-Sep-20	30-Sep-23			Guyon, Thomsen, Meier, Strassman

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Investigating vital rate drivers of UMRS fishes to support management and restoration						
2019VR8	Data set complete (data delivered to Ben Schlifer, physical structures delivered to BRWFS)	30-Sep-2021	31-Dec-23		Mean length at age across all species, years, and field station complete. However, not applied to all fishes yet. Some species have been completed and shared. We have refined code to accomplish this fully now. Catch curves, measures of mortality, recruitment and growth expected to be complete for rest of species by end of year.	Quinton Phelps
On-Going						
2019VR10	Submit draft manuscript (Drivers of vital rates)	31-Dec-2021	31-Dec-23		Thesis chapter has been completed and is being revised for submission for publication	Quinton Phelps, Kristen Bouska
2019VR11	Submit draft manuscript (Microchemistry)	31-Dec-2021	31-Dec-22	1/15/2023	Delayed by having to make several repairs to mass spectrometer; instrument down-time slowed our progress. In June completed analysis of otolith samples from all LTRM fish to be used in the project. The remaining steps data analysis and writing.	Greg Whitledge
Intended for distribution						
Manuscript: vital rates of Channel Catfish, led by Colby Gainer (MS student) (in review with the North American Journal of Fisheries Management; 2019VR9; Bouska, IP-121915)						
FY19 Funded Science in Support of Restoration and Management						
Reforesting UMRS forest canopy openings occupied by invasive species						
2019ref3	Draft LTRM Completion	30-Apr-2021	30-Jun-23			Guyon and Cosgriff
2019ref4	Final LTRM Completion	30-Sep-2021	30-Jun-23			Guyon and Cosgriff

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
A year of zooplankton community data from the habitats and pools of the UMR						
2019zoo2	Draft LTRM Completion report on utility of zooplankton community monitoring for HREP assessment	30-Dec-2020	22-Dec-2023		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	30-Jun-2023			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	22-Dec-2023			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	30-Jun-2023			Sobotka
FY19 Funded Illinois Waterway 2020 Lock Closure						
Pre- and Post-Maintenance Aerial Imagery for Illinois River's Alton through Brandon Lock and Dams, 2019-2021.						
2023IWW	Final LTRM Completion Report (2022IWW)	30-Apr-2023		1-Dec-2022		Strassman
Fish Community Response to the 2020 Illinois Waterway Lock Closure						
2022FSH1	Draft Manuscript: Fisheries and WQ	31-Dec-22	30-Sep-23		Data analysis was more complicated and time intensive than anticipated.	Lamer

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2023 Science in Support of Restoration and Management Scope of Work

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
FY20 Funded Science in Support of Restoration and Management						
Mapping Potential Sensitivity to Hydrogeomorphic Change in the UMRS Riverscape and Development of Supporting GIS Database and Query Tool						
2021HG6	Submit draft LTRM Completion report on hydrogeomorphic change GIS database and query system	31-Dec-2021	30-Sep-2022	07-Oct-2022		Vaughan, Strange, Fitzpatrick, Van Appledorn, USACE core team
2021HG7	Submit Final LTRM Completion report on hydrogeomorphic change GIS database and query tool.	30-Mar-2022	30-Jun-2023		Update 5/5/23: Reconciling peer review comments	Vaughan, Strange, Fitzpatrick, Van Appledorn, USACE core team
Improving our understanding of historic, contemporary, and future UMRS hydrology by improving workflows, reducing redundancies, and setting a blueprint for modelling potential future						
2021HH1	Historic and Contemporary Hydrologic Database Release and Documentation	30-Sep-2021	31-Jul-2023		Delayed due to issues of data acquisition from USACE; expected submission of data and metadata to USGS Fundamental Science Practices 31-Dec-2022	M. Van Appledorn, L. Sawyer
2021HH2	Draft LTRM Completion Report: document database and documentation development steps, database capabilities, and quantitative summaries of the	30-Dec-2021	31-Jul-2023		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-Sep-2023			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-March-2023	29-Mar-23		M. Van Appledorn, L. Sawyer

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Understanding physical and ecological differences among side channels of the Upper Mississippi River System						
2021SC4	Final report on UMRR management implications submitted for USGS review	30-Sep-2022	30-Mar-2023		Delayed with McCain moving to new position	Sobotka & McCain
2021SC5	Manuscript on benthic invertebrate associations with side channel characteristics submitted for USGS and peer review	30-May-2023				Sobotka & Vander Vorste
Refining our Upper Mississippi River's ecosystem states framework						
Intended for Distribution						
Manuscript: Integrating machine learning and ecosystem state concepts: Modeling submersed plant resilience and vulnerability to ecosystem state transitions. (2021SS10; in USGS review, Delaney and Larson, IP-141445)						
Tool: Submersed aquatic vegetation vulnerability evaluation application (SAVVEA); (Completed, 2021SS10; Delaney and Larson, IP-142969)						
Augmenting the UMRR fish vital rates project with greater species representation for genetics and otolith microchemistry						
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 units)	31-Dec-2022				Bartels, Bouska, Davis, Lamer, Larson, Phelps, Tan, Whitledge
Functional UMRS fish community responses and their environmental associations in the face of a changing river: hydrologic variability, biological invasions, and habitat						
2021FF2	Draft manuscript: "Has large scale ecosystem rehabilitation altered functional fish community expressions in the Upper Mississippi River	30-Sep-2021	30-Mar-2023		Delayed with other priorities such as S&T Report writing and Gatto moving to other agency	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-Mar-2023			Ickes and Gatto

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Understanding landscape-scale patterns in winter conditions in the Upper Mississippi River System						
2021WL1	System wide spatial layers of habitat conditions	30-Sep-2022	30-Dec-2023		Lead author on family leave and in a new job	Mooney, Dugan, Magee
2021WL2	Draft manuscript: Landscape scale controls on overwintering habitat in a large river	30-Sep-2022	30-Dec-2023		Lead author on family leave and in a new job	Mooney, Dugan, Jankowski, Magee
2021WL3	Draft manuscript: Response of oxygen dynamics to ice and snow phenology in backwater lakes	30-Sep-2023				Jankowski, Dugan, Burdis, Kalas, Kueter
2021WL4	Draft Manuscript: Patterns in sediment characteristics and oxygen demand across a winter riverine landscape	30-Sep-2023				Perner, Kreiling, Jankowski, Giblin
Forest Response to Multiple Large-Scale Inundation Events						
2021FR3	Technical Report	1-Jun-2022	30-Sep-23		Delayed due to staffing shortages, hiring of new staff at NGREC	Cosgriff, Guyon, De Jager
FY22 Funded Science in Support of Restoration and Management						
Assessing Forest Development Processes and Pathways in Floodplain Forests along the Upper Mississippi River using Dendrochronology						
2023dendro1	Finalize the scanning of 1,100 tree cores uploaded into DendroElevator	30-Nov-2023				Windmuller-Campione
2023dendro2	Annual summary	31-Dec-2023				Windmuller-Campione and Van Appledorn
2023dendro3	Coordination and scheduling for three to five virtual meetings; Meetings will address current objectives outlined in Activity 3 and future	1 March – 31 May 2024				Windmuller-Campione and Van Appledorn
2023dendro4	Draft manuscript – Age data of floodplain forests of the Upper Mississippi River	30-May-2024				Windmuller-Campione and Van Appledorn
2023dendro5	Draft Manuscript – Growth dynamics of silver maple of the Upper Mississippi River	30-Sep-2024				Windmuller-Campione and Van Appledorn

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2023dendro6	Final report writing, edits on manuscript, and completion of all data storage	30-Nov-2024				Windmuller-Campione and Van Appledorn
Evaluating the LOCA-VIC-mizuRoute hydrology data products for scientific and management applications in the UMRS						
2023Hydro1	LOCA-VIC-mizuRoute data product evaluation	31 June 2023				Sawyer and Van Appledorn
2023Hydro2	LTRM project management team update on evaluation results	31 June 2023				Sawyer and Van Appledorn
2023Hydro3	ECB 2018-14 compliance completion	30-Sep-2023				Sawyer and Van Appledorn
2023Hydro4	Annual update: Year 1	31-Dec-2023				Sawyer and Van Appledorn
2023Hydro5	UMRS projected hydrology data and documentation release	30-Sep-2024				Sawyer and Van Appledorn
2023Hydro6	UMRR webinar on UMRS projected hydrology data release	31-Dec-2024				Sawyer and Van Appledorn
2023Hydro7	Virtual workshop or LTRM project team update for red pathway outcomes	31-Mar-2024				Sawyer and Van Appledorn
2023Hydro8	Draft LTRM completion report	30-Sep-2024				Sawyer and Van Appledorn
2023Hydro9	Final LTRM completion report	30-Dec-2025				Sawyer and Van Appledorn
Putting LTRM's long-term phytoplankton archive to work to understand ecosystem transitions and improve methodological approaches						
2023Phyto1	System-wide phytoplankton community dataset	30-Sep-2023				Jankowski
2023Phyto2	Draft Manuscript: Phytoplankton community composition over the past 20 years in the Upper Mississippi River: distribution of harmful taxa and relationships with environmental trends	30-May-2024				Jankowski and others
2023Phyto3	Draft Manuscript: Relating phytoplankton communities to distinct vegetation recovery trajectories in Pools 4 and 13	30-May-2024				Jankowski and others

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2023Phyto4	Report: Assessment of FloCam for use on archived and fresh phytoplankton samples for LTRM sampling	30-Mar-2024				Larson, James
2023Phyto5	Draft Manuscript: Comparison of trends captured by microscopy and FlowCam phytoplankton community analysis	30-May-2024				Larson, James
Assessing long term changes and spatial patterns in macroinvertebrates through standardized long-term monitoring						
2023inv1	Field collection of macroinvertebrates	14-Jun-2023				State field station staff
2023inv2	Laboratory identification of macroinvertebrates	30-Aug-2023				TBD
2023inv3	Screening level mayfly tissue analysis	30-Sep-2023				Giblin
2023inv4	Annual summary	31-Dec-2023				Lamer
2023inv5	Complete data entry and QA/QC of 2023 data; 1250 observations.					
	a. Data entry completed and submission of data to USGS (Includes contaminant data)	31-Jan-2024				State field station staff, Giblin
	b. Data loaded on level 2 browsers; QA/QC scripts run and data corrections sent to Field Stations	15-Feb-2024				Lamer, Schlifer
	c. Field Station and contaminant QA/QC with corrections to USGS	15-Mar-2024				State field station staff, Giblin
	d. Corrections made and data moved to public Web Browser	30-Mar-2024				Lamer, Schlifer
2023inv6	Field collection of macroinvertebrates	14-Jun-2024				State field station staff
2023inv7	Laboratory identification of macroinvertebrates	30-Aug-2024				TBD
2023inv8	Screening level mayfly tissue analysis	30-Sep-2024				Giblin
2023inv9	Annual summary	31-Dec-2024				Lamer

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Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2023inv10						
	a. Data entry completed and submission of data to USGS (Includes contaminant data)	31-Jan-2025				State field station staff, Giblin
	b. Data loaded on level 2 browsers; QA/QC scripts run and data corrections sent to Field Stations	15-Feb-2025				Lamer, Schlifer
	c. Field Station and contaminant QA/QC with corrections to USGS	15-Mar-2025				State field station staff, Giblin
	d. Corrections made and data moved to public Web Browser	30-Mar-2025				Lamer, Schlifer
2023inv11	Draft LTRM Completion report or manuscript on contaminant sampling	30-Sep-2025				Giblin
2023inv12	Field collection of macroinvertebrates	14-Jun-2025				State field station staff
2023inv13	Laboratory identification of macroinvertebrates	30-Aug-2025				TBD
2023inv14	Annual summary	31-Dec-2025				Lamer
2023inv15						
	a. Data entry completed and submission of data to USGS (Includes contaminant data)	31-Jan-2026				State field station staff, Giblin
	b. Data loaded on level 2 browsers; QA/QC scripts run and data corrections sent to Field Stations	15-Feb-2026				Lamer, Schlifer
	c. Field Station and contaminant QA/QC with corrections to USGS	15-Mar-2026				State field station staff, Giblin
	d. Corrections made and data moved to public Web Browser	30-Mar-2026				Lamer, Schlifer
2023inv16	Draft LTRM Completion report or manuscript on macroinvertebrate sampling, trends, etc.	30-Sep-2026				Lamer

ATTACHMENT D

Additional Items

- Future Meeting Schedule (*D-1*)
- Frequently Used Acronyms (4-29-2022) (*D-2 to D-8*)

QUARTERLY MEETINGS FUTURE MEETING SCHEDULE

FEBRUARY 2024	
<u>Virtual</u>	
February 27	UMRBA Quarterly Meeting
February 28	UMRR Coordinating Committee Quarterly Meeting

MAY 2024	
<u>Quad Cities</u>	
May 21	UMRBA Quarterly Meeting
May 22	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-IW/W	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