Virtual Meeting

Upper Mississippi River Restoration Program Coordinating Committee

Quarterly Meeting

August 11, 2021

Agenda

with
Background
and
Supporting Materials

UPPER MISSISSIPPI RIVER RESTORATION PROGRAM
COORDINATING COMMITTEE

August 11, 2021

8:00 a.m. – 2:30 p.m. CDT

AGENDA

[**Note:** The states, U.S. Army Corps of Engineers, and the Department of the Interior will arrange their respective pre-meetings via conference call prior to the August 11, 2021 quarterly meeting.]

Time	Attachment	Topic	Presenter
8:00 a.m.		**Welcome and Introductions**	***Brian Chewning***, *USACE*
8:05	**A1-14**	**Approval of Minutes of May 26, 2021 Meeting**	
8:10		**Regional Management and Partnership Collaboration**	***Marshall Plumley***, *USACE*
	B1-4	▪ FY 2021 Fiscal Update and FY 2022 Outlook	
	B5-10	▪ 2015-2025 Strategic and Operational Plan Review ▪ 2022 Report to Congress ▪ 2021 UMRR Joint Charter Signing	
9:10		**Communications**	
	C1-2	▪ UMRR Communications Team	***Rachel Perrine & Jill Bathke****, USACE*
		▪ External Communications and Outreach Events	***All***
9:45		**Break**	
10:00		**UMRR Showcase Presentations**	
		▪ Modeling Future Hydrology Conditions on the UMRS	***Molly Van Appledorn****, USGS and* ***Lucie Sawyer****, USACE*
		▪ HREP Story Maps	***Kayleigh Thomas****, USACE*
10:45		**Program Reports**	
		▪ Habitat Restoration	
		– District Reports	***District HREP Managers***
11:45		**Lunch**	
12:15 p.m.		**Program Reports (Continued)**	
		▪ Long Term Resource Monitoring and Science	
	D1-15	– LTRM FY 2021 3rd Quarter Highlights	***Jeff Houser****, USGS*
		– Status and Trends Report 3rd Edition	
		– USACE LTRM Update	***Karen Hagerty****, USACE*
	D16-21	– LTRM Implementation Planning	***Karen Hagerty****, USACE and* ***Jeff Houser****, USGS*
		– A-Team Report	***Scott Gritters****, IA DNR*
1:00		**NESP Update**	***Andrew Goodall****, USACE*
2:00		**Other Business**	
	E1	▪ Future Meeting Schedule	
2:30 p.m.		**Adjourn**	

[See Attachment E for frequently used acronyms, UMRR authorization (as amended), and UMRR (EMP) operating approach.]

Continued on next page for remote connection information

Remote Connection Information:

August 11
UMRR Coordinating Committee Quarterly Meeting (8:00 a.m. to 2:30 p.m. CDT)

- Web and video conferencing:
  https://umrba.my.webex.com/umrba.my/j.php?MTID=m05d306d933f96295434e8f414a89c011
- Phone connection:
  - Dial-in: 312-535-8110
    [Note: In the event that the call line provided is experiencing a high volume of calls, you may also connect by dialing 469-210-7159.]
  - Access code: 182 276 1275
  - Password: 1234

ATTACHMENT A

Minutes of the May 26, 2021
UMRR Coordinating Committee Quarterly Meeting

(A-1 to A-14)

DRAFT
Minutes of the
Upper Mississippi River Restoration Program
Coordinating Committee

May 26, 2021
Quarterly Meeting

Virtual Meeting

Sabrina Chandler of the U.S. Fish and Wildlife Service called the meeting to order at 8:00 a.m. on May 26, 2021. UMRR Coordinating Committee representatives on the virtual meeting were Brian Chewning (USACE), Mark Gaikowski (USGS), Chad Craycraft (IL DNR), Randy Schultz (IA DNR), Megan Moore (MN DNR), Matt Vitello (MO DoC), Jim Fischer (WI DNR), Verlon Barnes (NRCS), and Ken Westlake (USEPA). A complete list of attendees follows these minutes.

Chandler announced that Illinois DNR recently named Chad Craycraft as Illinois DNR's UMRR Coordinating Committee member. Craycraft said he is the Federal Programs Coordination Manager for Illinois DNR and expressed enthusiasm for the new role.

Minutes of the February 24, 2021 Meeting

Randy Schultz moved and Matt Vitello seconded a motion to approve the draft minutes of the February 24, 2021 UMRR Coordinating Committee meeting as written. The motion carried unanimously.

Regional Management and Partnership Collaboration

Marshall Plumley expressed appreciation for the partnership's implementation of the Earth Day social media campaign. The campaign theme was "Restore Our Earth," with specific messages acknowledging the program's 35th anniversary. UMRR's implementing partners were involved in the effort either by sharing, being tagged, or developing their own language and posts. The effort required considerable coordination, had tremendous reach, and increased awareness of UMRR.

FY 2021 Fiscal Update

Plumley said UMRR has obligated over $18.1 million, or 54.6 percent, of its $33.17 million FY 21 funds to-date. The obligation rate is on target. Cost savings realized for Harpers Slough and Huron Island resulted in additional funding available for those projects. In response to a question from Jim Fischer, Plumley said he does not have any concerns about low water impacting projects. In response to a question from Andrew Stephenson, Plumley explained that cost savings from Harpers Slough may be used to advance other restoration objectives within the project or be reallocated to other program priorities if necessary. Huron Island cost savings are substantial. Given that the project is nearly complete, those funds will likely be allocated to another project in construction by the end of the fiscal year. Ken Westlake suggested that a footnote be added to explain that red items in the fiscal reports signify savings.

FY 2022 Budget Outlook

Plumley said the President's FY 22 budget has not yet been released but that it is anticipated to be published by the end of May 2021.

UMRR Ten-Year Plan

Plumley explained that adjustments to UMRR's ten-year plan include timeline extensions for planning for Reno Bottoms habitat project and Lower Pool 13 habitat project. Other changes were editorial corrections – e.g., adjusting project names and location information. Plumley anticipates adding additional projects to the ten-year plan in the next fiscal year.

Acres Restored

Plumley said that 332,657 acres of habitat have been restored, created, improved or protected from FY 2012-2020 under the Corps' aquatic ecosystem restoration programs and projects. Over that period, UMRR has restored 31,370 acres or approximately ten percent of the acres. Physical construction of three projects totaling 5,590 acres is anticipated to be completed by December 2021, increasing UMRR's total acres restored to 111,000 acres through 59 completed projects. Planting of trees or aquatic vegetation may extend out after physical construction is complete. These projects include Conway Lake, Pool 12 Overwintering, and Ted Shanks. Another four projects are anticipated to be completed in 2022 that will collectively add 9,810 acres to UMRR's total restored or improved habitat. Plumley said these restoration accomplishments in the next year will help to underscore the program's value, particularly in the 2022 Report to Congress and other forums. Potential project construction completions for FY 22 include Bass Ponds, Harpers Slough, Beaver Island, and Huron Island. Even though significant construction delays over the past four to five years due to high water, UMRR continues to make important ecosystem restoration contributions.

Andrew Stephenson expressed appreciation for the perspective on potential project completions. Stephenson noted that UMRR is on schedule to restore 120,000 acres by the end of FY 22. Olivia Dorothy asked if the Corps was working with the White House Council on Environmental Quality (CEQ) to ensure UMRR acres are recognized as part of the America the Beautiful Initiative to conserve, connect, and restore 30 percent of that nation's lands and waters by 2030. Plumley said he has not been contacted directly about that, but that he believes the Corps is engaged in sharing information on that topic. Dorothy expressed concern that the Corps is not one of the key agencies working on the initiative. Sabrina Chandler said USFWS is deeply engaged in the America the Beautiful Initiative and that UMRR HREPs on the Refuges contribute to that. Chandler said she plans to share more information during the external communications portion of the agenda and provided a link to the initial DOI report that discusses the Initiative, which is as follows: https://www.doi.gov/sites/doi.gov/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf.

UMRR Joint Charter Review

Plumley recalled that on February 10, 2021, the UMRR Coordinating Committee held a virtual meeting to discuss the review of the 2013 Joint Charter of the Upper Mississippi River Restoration Coordinating Committee, Analysis Team, and Habitat Rehabilitation and Enhancement Projects Selection Process Teams. The UMRR Coordinating Committee reviewed the A-Team's suggested edits to its provisions in the Charter. The Coordinating Committee accepted the majority of the A-Team's suggested changes and provided some revised language for the A-Team to consider as follows:

- Remove the line "e.g., through operationalizing adaptive management at the project or larger scale" from the A-Team's seventh listed responsibility.
- Reword the statement at the end of the A-Team's Purpose or the A-Team's third listed role to clarify confusing and potentially contradictory language. A potential rewording for the role was suggested as "3. Advise the UMRR CC regarding the technical implications of decisions affecting LTRM, including policy, programmatic, and budget matters."

Plumley said that, on May 12, 2021, the A-Team revised its respective section of the Joint Charter of Consultative Bodies in response to direction from the UMRR Coordinating Committee. The A-Team removed the line from the seventh listed responsibility and removed a line from their purpose statement to address the contradiction and eliminate confusion with the third listed role. The third listed role was unchanged. Plumley said that Nick Schlesser will provide additional context on the discussion during the A-Team update.

In a May 25, 2021, email to the Coordinating Committee, Stephenson clarified the A-Team's edits and attached a corrected version of the Charter that is newer than the version included in the meeting agenda packet.

2015-2025 Strategic and Operational Plan Review

Plumley said a survey is being developed for distribution to the UMRR partnership at-large regarding the 2015-2025 Strategic and Operational Plan. The purpose being to seek input regarding progress achieved since 2015, priorities for the next five years, and the issue areas to include in the 2022 Report to Congress. The UMRR Coordinating Committee will be requested to review a draft version of the survey in early summer. Stephenson said Coordinating Committee members will be asked to provide contact information for people within their respective agency who should receive the survey.

2022 Report to Congress

Plumley reported that, on April 14, 2021, the *ad hoc* team developing an outline for the UMRR 2022 Report to Congress met to discuss the Coordinating Committee's feedback on the draft outline of the report. Plumley provided a summary of those comments as follows:

- The Executive Summary should organize aspects around the four floodplain reaches.
- The History and Background Chapter should explain UMRR's accomplishments and efficiencies gained from consistent funding of $33.17 million.
- The Strategic Partnership and Vision Chapter should acknowledge stressors to the ecosystem.
- The Enhancing Habitat Chapter should describe the ways in which UMRR is more responsive and efficient in executing projects and include case studies to highlight projects that have been designed to address challenges of high water.
- Implementation Issues should be phrased in a way to be seen as opportunities.

Plumley said next steps include finalizing the report outline and identifying chapter authors and contributors. Plumley noted that, as program manager, he will be responsible for assembling material in collaboration with others. The intent is to have drafts of individual sections by the end of September and a consolidated draft of the report by December 31, 2021.

Jim Fischer expressed appreciation for the effort and the opportunity to review the outline. Fischer noted that UMRBA had previously been contracted to help write the program's reports to Congress and asked if there has been a departure from past practice. Plumley explained that he has had initial discussions with UMRBA about a contract for support in developing the report and that he is starting to work with the contracting office. In response to a question from Fischer, Plumley said partners will be asked to provide direct input regarding the report content and be involved in crafting language for the report not just reviewing the overall document. Fischer emphasized, and Plumley agreed, that a key aspect of the program is the rich partnership and that it requires all partners for implementation.

Desired Future Condition

Plumley said the UMRR Coordinating Committee will soon initiate a process to develop a desired future condition for the UMR ecosystem through a qualitative narrative approach. As an initial step, a summary of efforts to-date to define a desired future condition will be drafted for inclusion in the 2022 Report to Congress. A more deliberate evaluation is being planned to define desired future conditions through a structured partnership discussion. A small *ad hoc* group will be assembled to scope this process.

LTRM Implementation Planning

Plumley reported that, on May 21, 2021, an *ad hoc* team scoping the LTRM implementation planning effort convened a meeting to discuss the timeframe, participants, facilitation, and process. Members of the *ad hoc* team include Jim Fischer, Megan Moore, Matt Vitello, Mark Gaikowski, Jeff Houser, Jennie Sauer, Marshall Plumley, Karen Hagerty, Andrew Stephenson, and Kirsten Wallace. Fischer expressed appreciation for the team's work and said this strategic planning will position the program well to receive its increased annual authorized appropriation. He suggested considering how any additional funds might be used to further integrate LTRM and HREP.

Communications

UMRR Communications and Outreach Team

Jill Bathke said the UMRR Communications and Outreach Team's purpose is to develop, organize, and implement clear and updated communication materials. Over the last few months, the team developed and implemented a social media campaign to celebrate Earth Day with the theme "Restore Our Earth." UMRR's partnering agencies coordinated in publishing a series of social media posts. The campaign reached over 34,000 Facebook users and 18,000 Twitter users. We gained insights around tagging and photo uploading issues on Facebook. It will be important to engage partner agency communications staff earlier in planning future social media campaigns. Kirsten Wallace applauded the team for executing the social media campaign and for generating social media energy around the program. She expressed appreciation for the posts that showcased partner contributions. The series was reflective of the program's breadth. Jim Fischer agreed and said he learned more about the process for coordinating internally within Wisconsin DNR to participate in social media campaigns. Moore said it was a good learning opportunity for Minnesota DNR as well and helped identify how they could improve their own messaging about the Mississippi River and UMRR. In response to a question from Sadie Neuman, Bathke said USACE cannot use TikTok and Instagram did not seem like a good option because of the use of videos and website references. A more photo-based campaign would be better suited for Instagram.

Bathke said the team is also finalizing a draft UMRR flyer and will send it to the UMRR Coordinating Committee for comments in the coming weeks. The flyer is geared toward a general audience with limited knowledge of UMRR and will highlight the value of the UMRS and benefits of UMRR in the context of water, wildlife, and way of life. Karen Hagerty suggested making the website a little more prominent. In response to a comment from Neuman, Bathke said a QR code was considered but ultimately not included due to limited spacing and concerns about long-term viability of keeping links updated. Matt Mangan suggested adding river viewing in the flyer. Plumley said UMRR could organize a production run of the flyers in a glossy format and distribute to partners but that an electronic version will be distributed to partners that they can use to make hard copies.

Bathke reported that the team also discussed how UMRR can recognize and celebrate its 35th anniversary and will continue this discussion at their next meeting. Initial discussions included identifying audiences and key messages. Potential activities included sharing printed flyers during 2021 boat tours, developing a five-minute video with interviews from members of the partnership and public, and a photo contest. In response to a question from Hagerty, Bathke said the team is hoping to have the flyer available for the

MRC low water trip in August 2021. Kim Schneider suggested having a UMRR-theme based issue of USACE's *Our Mississippi* newsletter. Bathke said the team would like to consider that opportunity. Jennie Sauer said the "Mississippi River Photos" Facebook group may be a good place to advertise a photo contest. Hagerty noted that it is a private group and requires permission to join. Fischer said that LTRM crews spend thousands of hours out on the river and could be a resource as well.

The team's future activities include finalizing an inventory of existing UMRR communications and outreach materials, identifying additional communication and outreach needs, developing HREP/LTRM signage, revisiting the existing draft Communication and Outreach plan, and refining the Lower Illinois River Pilot Project. Fischer expressed appreciation to the Communications Team efforts and asked if there was a timeline established for the 35th anniversary effort. Bathke said the timeline is being developed and will include a schedule and milestones for that effort. Schneider commended the team on the flyer.

External Communications and Outreach

Communication and outreach activities in the second quarter of FY 21 include the following:

- Sabrina Chandler said USFWS is participating in the America the Beautiful Initiative. The USFWS Midwest Regional Director submitted to Headquarters UMRR HREPs on Refuges as means for addressing the Administration's land conservation priorities. Principal Deputy Director, Martha Williams, is planning visits to field stations to highlight Service activities that support the priorities of the Initiative such as engaging communities, climate change, and resiliency. Director Williams would likely visit the Upper Mississippi River Region in August 2021. Chandler will connect with partners as more details are known. Chandler said USFWS also participated in UMRR's social media campaign and conducted local outreach with UMRR habitat projects in construction.

- Jeff Houser said KathiJo Jankowski, Danelle Larson, and Molly Van Appledorn gave presentations at the Society for Freshwater Science's 2021 annual meeting held virtually.

- Kirsten Wallace said UMRBA provided a April 30, 2021 briefing to Sen. Tammy Baldwin's office on forest conditions in the UMRS, UMRR's restoration efforts in Wisconsin waters, and how NESP could help further support restoration of the region's forests. Wallace said UMRBA hopes to provide similar briefings to other Congressional member offices. Wallace expressed appreciation to Angela Deen for presenting UMRR-related information and Andrew Goodall for his briefing of NESP's forestry plan. Jim Fischer said that he and Steve Galarneau attended the meeting with Sen. Baldwin as well.

- Fischer said he presented to the Mississippi River Study Committee of Wisconsin's Conservation Congress, including UMRR and LTRM in particular. The Conservation Congress provides advice to WI DNR on managing state resources and the Mississippi River Committee is looking to increase the number of meetings they have every year regarding the river. The Committee expressed its support for UMRR.

- Megan Moore said she was able to leverage LTRM science during a recent presentation to Minnesota DNR staff. The agency was going through intensive data dive to learn the state of knowledge and science on invasive carp and relied heavily on the status, conditions, and trends in the UMR, using insights gleaned through the upcoming LTRM Status and Trends Report. Karen Hagerty asked how aware Minnesota DNR staff are of UMRR and LTRM. Moore said that staff who worked along the Mississippi River had a working knowledge of the program, but staff from other parts of the states were not familiar. Moore reflected that the presentation represented an important internal outreach opportunity within the agency.

- Mark Gaikowski said USGS is hosting an invasive carp event on June 3, 2021 at L&D 19 to showcase the underwater acoustic deterrent system. Gaikowski said USGS staff will discuss the value of UMRR habitat restoration and fish monitoring data as well as the benefits of preventing upstream movement of invasive carp at L&D 19.

- Scott Gritters said he was asked to participate in the Goldstar Teachers program to present on reclaiming coal mines and restoration of mussels and the mussel industry. Gritters said the event scheduled for August 2021. It will be a unique opportunity to reach teachers in Iowa. In response to a request from Chandler, Gritters agreed to provide an update on the event at the August 11, 2021 UMRR Coordinating Committee quarterly meeting.

UMRR Showcase Presentations

Oakwood Bottoms Greentree Reservoir HREP

Jasen Brown provided an update on the Oakwood Bottoms Greentree Reservoir HREP. It is the first UMRR HREP to be sponsored by the U.S. Forest Service and will encompass 4,700 acres located in the Shawnee National Forest. The area is home to the Shawnee's largest Indiana bat maternity colony, provides critical waterfowl migration habitat, and has been the focus of many partnership and conservation efforts. Problems at the site include unnatural water level fluctuations, degraded forest community, and a reduction of emergent wetlands. Project objectives include:

- Increase regeneration of bottomland hardwood forest within the study area during the period of analysis.
- Restore natural hydrologic conditions and function to the floodplain by emulating natural flooding and drainage regimes in the study area during the period of analysis.
- Restore degraded wetland habitat in the study area for resident migratory wildlife during the period of analysis.

Brown commended Monique Savage's work as the plan formulator. The recommended plan is the Forest Service's preferred approach and includes berm modifications, water structure replacement, channel grading, and installation of a pump station and six well pumps to improve the ability to add and remove water from various areas, as needed. In the northern units, boundaries of existing subunits were modified and drainage channels upgraded to improve flow to pump stations or gravity drains. The restoration plans in this area are being integrated into Ducks Unlimited's recent restoration work in that area. In the southern units, more subunits will be opened and combined. The project will also include reforestation and timber stand improvement. The project feasibility report was approved by MVD in May 2021 and four design packages are anticipated to be advertised in January 2022.

In response to a question from James Lewis, Brown said sediment loading was not an issue put forward by the Forest Service and no significant changes to sediment loads are anticipated. Sabrina Chandler noted that the Shawnee National Forest has focused some work on climate change and geographic distribution of tree species including Cypress and tulip poplars. Chandler asked if that those types of considerations are being incorporated into the project. Brown said there is a Cypress community at Oakwood Bottoms and said that particular species will be evaluated as tree planting objectives are refined. Chandler said restoration efforts in that area do not typically involved a mix of tree species, but might be necessary in a resiliency context. That type of approach may also be necessary in UMRR's other habitat restoration in the southern portion of the basin. Brian Markert agreed and said USACE foresters have been recommending planting traditional southern tree species. Matt Mangan said Cypress trees are common throughout southern Illinois and Tupelo are found slightly further south than the project area but could be considered. Mangan said the Forest Service is looking at planting a

variety of oak and hickory species and have done so in recent reforestation efforts. In response to a question from Ken Westlake, Brown said the project will be construction ready in early FY 22 with construction dependent on available funding.

Wild Celery Winter Bud Dynamics

Alicia Carhart summarized a recent manuscript published in *Wetlands* regarding constraints on submersed vegetation distribution in the UMRS. Ecosystem health and resilience in the UMRS is often associated with submersed aquatic vegetation (SAV). This research focused on the combined effects of known constraints to SAV establishment and growth: water clarity, geomorphology, and water level fluctuations on aquatic vegetation. Methods included delineating areas in the UMRS where the effects of these combined conditions are not likely to limit the establishment of SAV. Modeling utilized data on daily water surface elevation at 121 gauges from 1993 to 2014, daily estimates of total suspended solids (TSS) during the growing season, and estimated light conditions suitable to support SAV, based on light conditions at bed elevations where SAV was detected in LTRM monitoring. SAV is expected to be limited by both minimum and maximum water depth requirements. The range of suitable elevations for SAV were defined with an upper boundary of low water level and lower boundary of average light conditions present at vegetated sites. The Upper Impounded Reach contained the largest proportion of suitable areas for SAV. For many pools in the Lower Impounded Reach, there was little suitable area based on the criteria – e.g., conditions are suitable for greater than 50 percent of years. Research indicates a complete absence of suitable area for SAV for some years in Pools 20-26 on the Mississippi River and all years in the La Grange and Alton pools on the Illinois River.

A system-wide 75 percent reduction in TSS was modeled to assess potential increases in suitable area for SAV and highlight areas that may respond well to vegetation restoration efforts. Even when modeling a 75 percent reduction in TSS, many pools in the Lower Impounded Reach had only minor increases in suitable area for SAV. Suitable area increased by 1,400 hectares or more in upper Pool 4, Pool 13, and Pool 19 with the same hypothetical TSS reduction. In the Peoria Pool, water clarity and water level fluctuation may not be the limiting factors for SAV presence, but other factors such as herbivory, seed bank viability, sedimentation, or water quality (chemical pollution) may be limiting SAV. These datasets can be downloaded from Science Base or viewed spatially within the UMRS-Systemic Spatial Data Viewer: https://www.umesc.usgs.gov/management/dss/umrs_land_cover_viewer.html

In response to a question from Karen Hagerty, Carhart said that TSS levels from Upper La Grange pool are extrapolated upstream to approximate TSS levels in Peoria Pool. Future modifications to the model could incorporate data from outside LTRM. Chuck Theiling applauded Carhart for the research and presentation and said that the wind fetch model developed by Jim Rogala shows Peoria Pool as a big windswept lake with lots of wind-wave sediment resuspension. Carhart said the spatial data viewer allows many layers to be considered simultaneously to better understand these issues. Doug Blodgett suggested that sediment quality may also be an issue in the Illinois River. Brent Knights asked if including a substrate factor in the model would help better predict SAV in Peoria Pool. Carhart said she hopes to refine the model to include other variables such as substrate, wind fetch, and velocities. Hagerty noted that the sediment in Peoria Pool is fine grained and easily disturbed. Blodgett said fluffy sediments also provide poor anchorage for plants. Jeff Houser said the simplicity of the model is a benefit and that the model effectively considers two physical conditions that constrain where vegetation may be regardless of other conditions. Megan Moore expressed appreciation for the research and asked if the data viewer allows users to assess impacts on the model from changes in water level fluctuations. Carhart said it is not interactive yet, but that a future goal is to allow for adjustments to TSS and water levels. Jim Fischer said this is a great example of how long term data can be used to inform restoration and management on the river.

Fischer announced that Carhart will be starting a new position on June 7, 2021 as the aquatic vegetation specialist at the La Crosse Field Station.

Long Term Resource Monitoring and Science

FY 2021 2nd Quarter Report

Jeff Houser reported that accomplishments of the second quarter of FY 21 include publication of the following manuscript and completion reports:

- Understanding constraints on submersed vegetation distribution in a large, floodplain river: the role of water level fluctuations, water clarity and river geomorphology
- Probabilities of detecting submersed aquatic vegetation species using a rake method may vary with biomass
- Bluegill habitat use in the Upper Mississippi River
- Gear specific catch rates and size structure of channel catfish in the Upper Mississippi River
- Integrating perspectives to understand lake ice dynamics in a changing world
- Aquatic ecosystem metabolism as a tool in environmental management

House reported that the UMRR LTRM Component Meeting was held on March 30-31, 2021 and had 55 participants. Topics include field station updates, research project presentations, and LTRM component meetings. Discissions involved sharing lessons learned on sampling safely during a pandemic. The Mississippi River Research Consortium's annual meeting was held virtually on April 22-23, 2021 and featured a session devoted to the upcoming LTRM status and trends report. Houser said a variety of other presentations and posters included contributions from LTRM staff or made use of LTRM data. He noted that the conference is a great resource for Mississippi River-related research and encouraged others to attend in the future.

Houser explained that USGS implemented a new bureau-wide Quality Management System (QMS) in October 2020 that provides a foundation to ensure laboratory activities meet a defined standard of quality. The LTRM Water Quality Analytical Laboratory was one of the first USGS labs to implement the new QMS, which included small modifications to work processes. This effort did not disrupt workflow. Additionally, the LTRM Water Quality Analytical Laboratory volunteered to participate in the USGS Standard Reference Sample Project that evaluates the performance of federal, state, private, and university laboratories' analyses of chemical constituents of environmental samples. Results show that LTRM water quality labs are rated excellent for phosphorous, nitrite, and nitrate as N. Jim Fischer said the water quality lab provides tremendous value to UMRR and reduces costs associated with sampling. Fischer expressed appreciation to Shirley Yuan for her leadership in the lab's operations.

Status and Trends 3rd Edition

Houser said that the Status and Trends Report 3rd Edition is being reviewed by USGS' Science Publishing Network (SPN) to produce a final version of the report. Figures are complete for eight of the ten chapters. Following report finalization, a summary brochure will be created for use in outreach and communication activities. A small group is planning for a strategic rollout to correspond with the report's publication.

USACE LTRM Report

Karen Hagerty said UMRR's LTRM allocation is $6.3 million ($5.0 million for base monitoring and $1.3 million for analysis under base) with an additional $2.5 million available for science in support of restoration and management. This represents the third year of consistent funding at this level and has contributed to the advancement of many science priorities. Funded science activities for FY 21 total

$8,678,114 and include LTRM base monitoring overage, IWW monitoring, COVID-related safety expenditures, graphical assistance on the status and trends report, adjustments to FY 20 proposals, and five FY 21 science in support of restoration and management projects. The remaining funds will be used to cover any potential emergencies or Corps labor.

A-Team Report

Nick Schlesser said the A-Team met via webinar on May 12, 2021. Topics discussed include revisions to the roles and responsibilities of the A-Team as outlined in the 2013 UMRR Joint Charter of Consultative Bodies, macroinvertebrate sampling and research needs, continued impacts of COVID-19 on agency policies and potential impacts to the 2021 field season, and transferring the A-Team Chair. The A-Team's recommended modifications to the A-Team's section of the Charter include:

- Removing the line "e.g., through operationalizing adaptive management at the project or larger scale" from the A-Team's seventh listed responsibility.
- Removing the phrase "on technical issues that do not raise policy or budgetary concerns" from the first paragraph of the A-Team's purpose.
- Replacing "as directed by UMRR CC" with "Any specific actions will be coordinated with and directed by the UMRR CC" in the A-Team's sixth listed responsibility.

Schlesser said the first two changes were passed unanimously at the meeting and the third change was approved by A-Team representatives via email vote after the meeting. The macroinvertebrate subgroup requested the A-Team's consideration of the following two recommendations: 1) reinstate the macroinvertebrate monitoring in 2022 and 2) develop a new focal area for macroinvertebrates. Although all states supported reinstatement and indicated it would likely be a priority, concern was expressed over voting on the recommendations without additional information on methods and budgets. Jim Lamer volunteered to develop a proposal including methods and budgets in a format that allows for comparison and prioritization by the A-Team relative to other science needs. Houser agreed to include a macroinvertebrate focal group in future science meetings and will engage the subgroup to develop a research framework. Schlesser reported that the A-Team Chair was transferred to Scott Gritters of Iowa DNR. The A-Team's next meeting will be held via webinar in July 2021. In response to a question from Tim Yager, Jennie Sauer said macroinvertebrate data was last collected in 2004. Karen Hagerty expressed appreciation for Schlesser's excellent leadership of the A-Team during his tenure as Chair.

UMRR Joint Charter Review Endorsement

As Chair, Sabrina Chandler requested a motion to accept the revised version of the A-Team's Charter. Verlon Barnes commented that the A-Team's Charter seems to require some responsibilities of NRCS that is beyond the agency's authority. In response to a question from Chandler, Karen Hagerty and Nick Schlesser explained that NRCS and USEPA are recognized as official members of the A-Team, but that the two agencies have not had designated representatives to the team in several years. Schlesser said the Charter was revised so that a formal vote would pass with a two-thirds majority of members present for the vote. This was important for the A-Team's effectiveness given challenges with reaching a quorum. Westlake said that USEPA participates in the UMRR Coordinating Committee and other financial discussions, as necessary, but that staffing issues have precluded the agency from designating a representative for the A-Team during his tenure over the last ten years. Barnes said that he is retiring in August 2021 and the NRCS Regional Conservationist for the Central Region position is currently vacant. This vacancy requires additional workload for him that will preclude his involvement in the A-Team that the Charter seems to demand. Hagerty acknowledged the valuable contributions of NRCS staff particularly with respect to knowledge of operations in the watershed. Hagerty expressed her interest in NRCS maintaining membership on the A-Team even if it is not staffed at this time. Chandler agreed and said USEPA and NRCS membership on the A-Team

should be maintained to allow for formal representation when and as permitted. Chandler recommended that Barnes abstain from the vote due to concerns over capacity to engage.

Matt Vitello moved and Jim Fischer seconded a motion to approve the A-Team Charter that was distributed via email on May 25, 2021. The motion carried with no opposition, NRCS abstained from the vote.

Jennie Sauer expressed understanding of staffing issues for both NRCS and USEPA and said their expertise is valuable in technical reviews of science proposals. Barnes and Westlake said they could not guarantee their ability to fulfill that request, but that review will be handled on a case-by-case basis. Chandler expressed appreciation for establishing expectations.

Westlake said that with the revised A-Team language accepted, there is a final document to act on and it would be appropriate for the Coordinating Committee to endorse the Joint Charter of Consultative Bodies as a whole and complete document. As Chair, Chandler requested a motion to endorse the Joint Charter of the Upper Mississippi River Restoration Coordinating Committee, Analysis Team, and Habitat Rehabilitation and Enhancement Projects Selection Process Teams with the accepted revisions to the A-Team Charter language. Jim Fischer moved and Matt Vitello seconded the motion. The motion carried with no opposition. NRCS abstained from the vote.

In response to a question from Hagerty, Barnes explained that NRCS still desires to participate in partnerships such as UMRR to the level agency staff are able.

In response to a question from Chandler, Stephenson said he will communicate with Coordinating Committee members to confirm their individual ability to sign the Charter on behalf of their respective agency prior to routing the Charter for electronic signatures. Fischer noted that the Charter includes a clause that views expressed under UMRR are non-binding on any agency. Chandler said that clause was likely included to address these concerns. Chandler confirmed that the tentative schedule is to complete the Charter signing electronically by the August 11, 2021 Coordinating Committee meeting.

Habitat Restoration

Angela Deen said MVP's planning priorities include Reno Bottoms and Lower Pool 10. An interagency site visit was held at Reno Bottoms on May 4, 2021 and considerable tree mortality was noted. A second run of the forest succession model will be used to re-evaluate alternatives and TSP selection is anticipated in fall 2021. A draft feasibility report for Lower Pool 10 is undergoing district quality review and a final report is anticipated to be submitted to MVD in fall 2021. The district's design priority was addressing repairs on three islands and backwater areas at Harpers Slough. The project's design was approved in January 2021 and a construction contract was awarded May 19, 2021. MVP has three projects in construction – McGregor Lake, Bass Ponds, and Conway Lake. Interior lake granular placement is occurring at McGregor Lake and a site visit occurred on May 25, 2021. Concrete stoplog structures are finished at Bass Ponds and installation of handrail metals, guard rails, access roads, and aluminum stop logs are next. Construction may be completed one year ahead of schedule and drawdowns may be possible this summer. One thousand willows were planted at Conway Lake and low water levels have aided final grading and seeding. MVP participated in the UMRR Earth Day social media campaign with Facebook posts on Bass Ponds, McGregor Lake, and Reno Bottoms. Pool 8 islands HREP was included in the Engineering with Nature Atlas. The district is planning a kick off meeting for Lower Pool 8 Big Lake in fall 2021, completing three performance evaluation reports, and a Trempealeau site visit scheduled for May 27, 2021 will be rescheduled.

Julie Millhollin said MVR's planning priorities include Lower Pool 13, Green Island, Pool 12 Forestry, and Quincy Bay. The Lower Pool 13 PDT is working on feature dependency relationships and refining the project area. TSP selection for Green Island is anticipated for fall 2021. The Pool 12 Forestry PDT is

finalizing project goals and objectives and developing a video for a virtual open house and public comment. A kick off meeting for Quincy Bay is anticipated in fall 2021. MVR's design priorities include Keithsburg Island and Steamboat Island Stage I. Keithsburg Division Stage II was fully designed to accommodate a dam permit application but will be broken into smaller contracts before advertising. The 65 percent review for Steamboat Island Stage I is scheduled for June 3, 2021. MVR has five projects in construction. Tree planting was completed at Pool 12 Overwintering Stages II and a final inspection occurred on May 20, 2021. Construction at Keithsburg Division Stage 1 is on hold until mid-July due to an occupied eagle nest and the PDT is working on a modification to add an articulated concrete mattress for Stage II. Huron Island Stage II planting was completed in May and ERDC is schedule to plant aquatic vegetation for Huron Island Stage III in June 2021. Mussel substrate is being placed at Beaver Island. Re-built pumps at Rice Lake were tested on April 20, 2021 and are fully operational. MVR is addressing sponsor comments on three fact sheets prior to submitting to MVD. In response to a question from Andrew Stephenson regarding extreme weather experienced by ERDC, Millhollin said that there were no concerns about damage to the vegetation from ERDC. Sabrina Chandler said she received positive feedback from her staff after the Pool 12 Overwintering final inspection.

Brian Markert said MVS's planning priorities include West Alton Islands, Oakwood Bottoms, and Yorkinut Slough. The West Alton Islands planning charette was completed this spring. The Oakwood Bottoms feasibility report was approved in May 2021. TSP selection for Yorkinut Slough is anticipated for fall 2021. MVS's design priorities include Piasa & Eagles Nest, Crains Island, and Oakwood Bottoms. Plans and specs for Piasa & Eagles Nest Phase II and Crains Island Phase II are both anticipated to be completed in fall 2021. Oakwood Bottoms is anticipated to be ready for advertising in the first half of FY22. Construction on a rock structure at Piasa & Eagles Nest is anticipated to begin in late-summer 2021. The pump station at Clarence Cannon is anticipated to be operational by fall 2021 and exterior berm setback is underway. Earth work and pile removal is ongoing at Crains Island. Reforestation is underway at Ted Shanks and pump station warranty work was completed in May 2021. Fact sheets with MDC, USFS, and IDNR/TNC as sponsors are being finalized and will be sent to MVD for approval later this year. Marshall Plumley expressed appreciation for all the hard work from partners to move the program forward. Chandler agreed noting that many adjustments were needed, but that a great deal of good work was being accomplished.

Other Business

Randy Schultz said the Iowa DNR has experienced significant turnover at the Bellevue field station. Mel Bowler retired and Kyle Bales accepted a position with the Corps' Rock Island District. Travis Keuter is the new fish lead. A new vegetation lead was also recently hired. The water quality lead is still vacant.

In response to a question from Olivia Dorothy, Kirsten Wallace said UMRBA coordinated with Congress regarding the increase in LTRM funding during the development of WRDA 2020.

Upcoming quarterly meetings are as follows:

- **August 2021 – Remote**
  - UMRBA quarterly meeting – August 10
  - **UMRR Coordinating Committee quarterly meeting – August 11**
- **November 2021 – TBD**
  - UMRBA quarterly meeting – November 16
  - **UMRR Coordinating Committee quarterly meeting – November 17**

- **February 2022 – TBD**
  - UMRBA quarterly meeting – February 22
  - **UMRR Coordinating Committee quarterly meeting – February 23**

In response to a question from Sabrina Chandler, Andrew Stephenson said the location for the November 2021 quarterly meeting is not yet known.

With no further business, Chad Craycraft moved and Randy Schultz seconded a motion to adjourn the meeting. The motion carried unanimously and the meeting adjourned at 12:54 p.m.

UMRR Coordinating Committee Virtual Attendance List
May 26, 2021

UMRR Coordinating Committee Members

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

Others In Attendance

Jim Cole	U.S. Army Corps of Engineers, MVD
Thatch Shepard	U.S. Army Corps of Engineers, MVD
Ben Robinson	U.S. Army Corps of Engineers, MVD
Leann Riggs	U.S. Army Corps of Engineers, MVD
Jim Lewis	U.S. Army Corps of Engineers, MVD
Angela Deen	U.S. Army Corps of Engineers, MVP
Jill Bathke	U.S. Army Corps of Engineers, MVP
Maria Delaundreau	U.S. Army Corps of Engineers, MVP
Jon Hendrickson	U.S. Army Corps of Engineers, MVP
Marshall Plumley	U.S. Army Corps of Engineers, MVR
Karen Hagerty	U.S. Army Corps of Engineers, MVR
Julie Millhollin	U.S. Army Corps of Engineers, MVR
Davi Michl	U.S. Army Corps of Engineers, MVR
Rachel Hawes	U.S. Army Corps of Engineers, MVR
Kara Mitvalsky	U.S. Army Corps of Engineers, MVR
Matthew Coffelt	U.S. Army Corps of Engineers, MVR
Rachel Perrine	U.S. Army Corps of Engineers, MVR
Brian Markert	U.S. Army Corps of Engineers, MVS
Jasen Brown	U.S. Army Corps of Engineers, MVS
Bandon Schneider	U.S. Army Corps of Engineers, MVS
Brian Johnson	U.S. Army Corps of Engineers, MVS
Rob Cosgriff	U.S. Army Corps of Engineers, MVS
Kim Schneider	U.S. Army Corps of Engineers
Chuck Theiling	U.S. Army Corps of Engineers, ERDC
Kraig McPeek	U.S. Fish and Wildlife Service, IIFO
Sara Schmuecker	U.S. Fish and Wildlife Service, IIFO
Tyler Porter	U.S. Fish and Wildlife Service, IIFO
Matt Mangan	U.S. Fish and Wildlife Service, IIFO
Tim Yager	U.S. Fish and Wildlife Service, UMR Refuges
Jeff Houser	U.S. Geological Survey, UMESC
Jennie Sauer	U.S. Geological Survey, UMESC
Brent Knights	U.S. Geological Survey, UMESC
Jennifer Dieck	U.S. Geological Survey, UMESC
Kristen Bouska	U.S. Geological Survey, UMESC
JC Nelson	U.S. Geological Survey, UMESC
Jim Duncker	U.S. Geological Survey, CMWSC
Mike Welavert	National Weather Service

Dave Glover	Illinois Department of Natural Resources
Kirk Hansen	Iowa Department of Natural Resources
Scott Gritters	Iowa Department of Natural Resources
Nick Schlesser	Minnesota Department of Natural Resources
Dru Buntin	Missouri Department of Natural Resources
Bryan Hopkins	Missouri Department of Natural Resources
Steve Galarneau	Wisconsin Department of Natural Resources
Alicia Carhart	Wisconsin Department of Natural Resources
Olivia Dorothy	American Rivers
Rick Stoff	Our Mississippi
Doug Blodgett	The Nature Conservancy
Jason Beverlin	The Nature Conservancy
Sadie Neuman	Unaffiliated Stakeholder
Kirsten Wallace	Upper Mississippi River Basin Association
Andrew Stephenson	Upper Mississippi River Basin Association
Mark Ellis	Upper Mississippi River Basin Association
Lauren Salvato	Upper Mississippi River Basin Association

ATTACHMENT B

Regional Management and Partnership Collaboration

- **UMRR Quarterly Budget Reports (7/21/2021)** *(B-1 to B-3)*
- **UMRR Ten Year Outlook FY 21 – FY 31 (8/2021)** *(B-4)*
- **Strategic Plan Review Crosswalk (7/27/2021)** *(B-5 to B-10)*

UMRR Quarterly Budget Report: Rock Island District

FY2021 Q3; Report Date: Wed Jul 21 2021

Habitat Projects

Project Name	Cost Estimates			FY2021 Financials			
	Non-Federal	Federal	Total	Carry In	Allocation	Funds Available	Actual Obligations
Beaver Island	-	$25,288,000	$25,288,000	$40,000	$1,025,000	$1,065,000	$168,220
Green Island, IA	-	$16,600,000	$16,600,000	-	$500,000	$500,000	$355,956
Huron Island	-	$15,773,000	$15,773,000	$43,278	$100,000	$143,278	-$227,472
Keithsburg Division	-	$29,643,000	$29,643,000	-	$3,945,000	$3,945,000	$631,624
Lower Pool 13	-	$25,288,000	$25,288,000	$42,666	$350,000	$392,666	$300,675
Pool 12 (Forestry)	-	-	-	$84,173	$500,000	$584,173	$262,039
Pool 12 Overwintering	-	$20,870,822	$20,870,822	$99,267	-	$99,267	$163,077
Quincy Bay, IL	-	-	-	-	$250,000	$250,000	$3,196
Rice Lake, IL	$7,280,000	$13,459,763	$20,739,763	-	-	-	$35,785
Steamboat Island	-	$41,977,000	$41,977,000	$50,000	$350,000	$400,000	$332,598
Total	$7,280,000	$188,899,585	$196,179,585	$359,384	$7,020,000	$7,379,384	$2,025,698

Habitat Rehabilitation

Subcategory	FY2021 Financials			
	Carry In	Allocation	Funds Available	Obligations
District Program Management	-	-	-	$458,529
Total	-	-	-	$458,529

Regional Program Administration

Subcategory	FY2021 Financials			
	Carry In	Allocation	Funds Available	Obligations
Adaptive Management	-	$200,000	$200,000	$127,500
Habitat Eval/Monitoring	-	$1,125,000	$1,125,000	$164,360
Model Certification/Regional HREP	-	$100,000	$100,000	$31,595
Public Outreach	-	$50,000	$50,000	$30,867
Regional Program Management	-	$1,200,000	$1,200,000	$809,594
Regional Project Sequencing	-	$275,000	$275,000	$207,332
Total	-	$2,950,000	$2,950,000	$1,371,247

Regional Science and Monitoring

Subcategory	FY2021 Financials			
	Carry In	Allocation	Funds Available	Obligations
Long Term Resource Monitoring	-	$5,000,000	$5,000,000	$4,648,617
Science in Support of Restoration/Management	-	$3,800,000	$3,800,000	$3,822,732
Total	-	$8,800,000	$8,800,000	$8,471,349

	Carry In	Allocation	Funds Available	Actual Obligations
Rock Island Total	$359,384	$18,770,000	$19,129,384	$12,326,824

UMRR Quarterly Budget Report: St. Louis District

FY2021 Q3; Report Date: Wed Jul 21 2021

Habitat Projects

Project Name	Cost Estimates			FY2021 Financials			
	Non-Federal	Federal	Total	Carry In	Allocation	Funds Available	Actual Obligations
Clarence Cannon	-	$29,800,000	$29,800,000	-	$850,000	$850,000	$297,896
Crains Island	-	$36,562,000	$36,562,000	$6,228	$4,000,000	$4,006,228	$1,008,898
Oakwood Bottoms	-	$29,000,000	$29,000,000	-	$350,000	$350,000	$803,969
Piasa - Eagle's Nest Islands	-	$26,746,000	$26,746,000	-	$825,000	$825,000	$2,005,187
Ted Shanks	-	$29,506,000	$29,506,000	-	-	-	$81,951
West Alton Missouri Islands	-	-	-	-	$275,000	$275,000	$152,353
Yorkinut Slough, IL	-	$8,500,000	$8,500,000	$2,718	$225,000	$227,718	$214,363
Total	$2,848,000	$204,549,000	$207,397,000	$8,947	$7,125,000	$7,133,947	$4,564,617

Habitat Rehabilitation

Subcategory	FY2021 Financials			
	Carry In	Allocation	Funds Available	Obligations
District Program Management	-	-	-	$362,526
Total	-	-	-	$362,526

Regional Program Administration

Subcategory	FY2021 Financials			
	Carry In	Allocation	Funds Available	Obligations
Habitat Eval/Monitoring	-	-	-	$41,296
Total	-	-	-	$41,296

	Carry In	Allocation	Funds Available	Actual Obligations
St. Louis Total	$8,947	$7,125,000	$7,133,947	$4,968,440

UMRR Quarterly Budget Report: St. Paul District

FY2021 Q3; Report Date: Wed Jul 21 2021

Habitat Projects

Project Name	Cost Estimates			FY2021 Financials			
	Non-Federal	Federal	Total	Carry In	Allocation	Funds Available	Actual Obligations
Bass Ponds, Marsh, and Wetland	-	$6,300,000	$6,300,000	-	$300,000	$300,000	$735,357
Conway Lake	-	$7,413,000	$7,413,000	$39,645	$300,000	$339,645	$179,878
Harpers Slough	-	$13,675,000	$13,675,000	-	-	-	$2,360,187
Lower Pool 10 Island and Backwater Complex	-	$17,000,000	$17,000,000	$12,700	$350,000	$362,700	$256,906
McGregor Lake	-	$23,550,000	$23,550,000	-	$5,875,000	$5,875,000	$961,253
Reno Bottoms	-	$10,000,000	$10,000,000	$105,337	$450,000	$555,337	$311,229
Total	-	$77,938,000	$77,938,000	$157,683	$7,275,000	$7,432,683	$4,804,810

Habitat Rehabilitation

Subcategory	FY2021 Financials			
	Carry In	Allocation	Funds Available	Obligations
District Program Management	-	-	-	$507,734
Total	-	-	-	$507,734

Regional Program Administration

Subcategory	FY2021 Financials			
	Carry In	Allocation	Funds Available	Obligations
Habitat Eval/Monitoring	-	-	-	$229,157
Total	-	-	-	$229,157

	Carry In	Allocation	Funds Available	Actual Obligations
St. Paul Total	$157,683	$7,275,000	$7,432,683	$5,541,702

Habitat Rehabilitation and Enhancement Projects	FY21	FY22	FY23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29		FY 31
							2027	October 2027 - September 2028	October 2028 - September 2029	October 2029 - September 2030	October 2030 - September 2031
Conway Lake, IA											
Bass Ponds, Marsh & Wetland, MN											
McGregor Lake, WI											
Harpers Slough Flood Damage Repair											
Lower Pool 10 Islands, IA											
Reno Bottoms, MN/IA											
Lower Pool 4, Big Lake, MN/WI											
TBD, MVP											
TBD MVP											
Rice Lake Stage I											
Pool 12 Stage II & III											
Huron Island Stage II & III											
Keithsburg											
Steamboat Island, IA											
Beaver Island Stage I & II											
Pool 13 Lower Islands											
Green Island, IA											
Pool 12 Forestry											
Quincy Bay, IL											
TBD MVR											
Ted Shanks, MO											
Clarence Cannon NWR, MO											
Piasa and Eagles Nest, IL											
Crains Islands, IL											
Harlow, MO											
Oakwood Bottoms, IL											
Yorkinut Slough, IL											
West Alton, MO Islands											
TBD, MVS											
TBD, MVS											
TBD, MVS											
	Feasibility Completion = 1 Design Completion = 1 Construction Completion = 3	Feasibility Completion = 3 Design Completion = 1 Construction Completion = 2	Feasibility Completion = 2 Design Completion = 5 Construction Completion = 2	Feasibility Completion = 3 Design Completion = 1 Construction Completion = 1	Feasibility Completion = 2 Design Completion = 2 Construction Completion = 2	Feasibility Completion = 1 Design Completion = 3 Construction Completion = 2	Feasibility Completion = 0 Design Completion = 2 Construction Completion = 2	Feasibility Completion = 1 Design Completion = 2 Construction Completion = 3	Feasibility Completion = 0 Design Completion = 1 Construction Completion = 5	Feasibility Completion = 0 Design Completion = 0 Construction Completion = 1	Feasibility Completion = 0 Design Completion = 0 Construction Completion = 0
HREP M&AM/Sponsor O&M Phase(2)											
(2) Physical features are turned over to the sponsor at construction completion for Operation & Maintenance. Monitoring & Adaptive Management activities will begin (WRDA 2039; as amended) and per the Feasibility Report.											

											October 2030 - September 2031
Adaptive Management											
Habitat Evaluation & Monitoring											
Long Term Resource Monitoring											
Model Certification/Regional HREP											
Public Outreach											
Regional Program Management											
Regional Project Sequencing											
Science in Support of Restoration/Mgmt.											

Strategic Plan Review Crosswalk

Background: In May, 2020, the UMRR Coordinating Committee conducted a midpoint review of the UMRR 2015-2025 Strategic and Operational Plan to assess how well the program has implemented actions and addressed needs identified therein. This included a pre-meeting survey to inform discussion of the many aspects of the strategic and operational plan. The following spreadsheet aligns the Objectives, Strategies, Needs, and Actions outlined in the Strategic and Operational Plan with results of the survey and priority actions that were identified at the May 2020 review meeting. This spreadsheet was used to inform items to include in the broad partnership survey that will identify needs and actions to prioritize over the remainder of the planning horizon (2021-2025).

Spreadsheet layout:

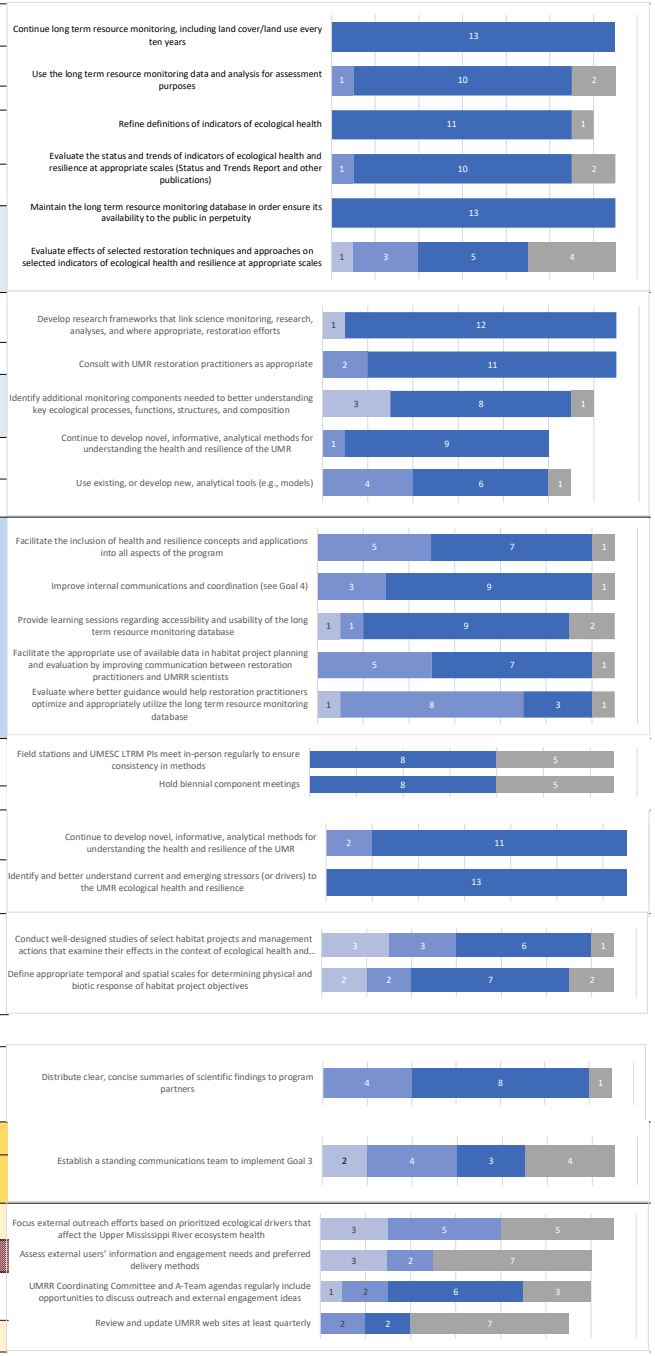
- **Column A-D:** Objectives, Strategies, Needs, and Actions outlined in the Operational Plan.
- **Column E:** Priority actions were identified during the Coordinating Committee review and discussion of the survey results during the May 2020 meeting. In the spreadsheet, priority actions are placed next to the component of the strategic and operation plan with which they most closely align. While many of the Coordinating Committee's suggestions directly align with Actions identified in the Operational Plan, some may relate to multiple Actions by directly addressing the underlying Strategy or Need in the Operational Plan. Cells are color-coded to match the level of the Plan to which they correspond (e.g., Strategy, Need, Action).
    - *White Cells*: Achieved >50% 'Well'/'Very Well' in survey and no proposed action
    - *Blue/Green/Yellow/Grey Cells*: Proposed action. Color and shade corresponds to relevant component of the Operational Plan.

    Using the survey results, we identified components of the Strategic and Operational Plan where less than 50% respondents rated progress as Well/Very Well and there was no corresponding proposed action by the Coordinating Committee. We refined this to identify Uncertainty (4 or more of the respondents answered 'Unsure') or Poor performance (4 or more respondents answered 'Poor').
    - *Pink Cell*: less than 50% 'Well'/'Very Well' and no proposed action
    - *Pink Hashed Cell*: less than 50% 'Well'/'Very Well', 4+ 'Unsure' responses, and no proposed action
    - *Red Cell*: less than 50% 'Well'/'Very Well', 4+ 'Poor' responses, and no proposed action
- **Column F**: Strategic Plan survey results

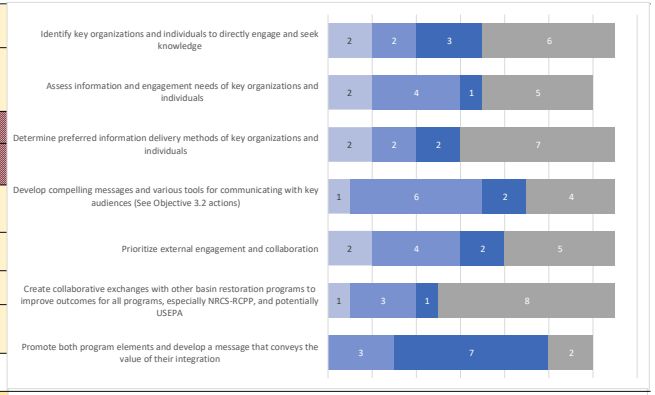
Category	Strategy	Need	Action	Priority Actions: No Proposed Action: >50% Well/V. Well	Priority Actions: No Proposed Action: <50% Well/V. Well	Priority Actions: No Proposed Action: <50% Well/V. Well and 4+ Unsure	Priority Actions: No Proposed Action: <50% Well/V. Well & 4+ Poor	Priority Actions: Level of Strategic Plan Proposed Action Corresponds With (*color aligns with Goal): Category	Priority Actions: Level of Strategic Plan Proposed Action Corresponds With (*color aligns with Goal): Strategy	Priority Actions: Level of Strategic Plan Proposed Action Corresponds With (*color aligns with Goal): Need	Priority Actions: Level of Strategic Plan Proposed Action Corresponds With (*color aligns with Goal): Action	Strategic Plan Progress
1.1	Selection	1) Identify habitat opportunities based on their potential contribution to increasing the UMR ecosystem's health and resilience	a) Update and expand the Habitat Needs Assessment to identify habitat enhancement and protection opportunities									Update and expand the Habitat Needs Assessment to identify habitat enhancement and protection opportunities: Poor 4, Fair 13, Well/Very Well 0, Unsure 0
			b) Incorporate insights gained from partner expertise and the UMRR Environmental Design Handbook									Incorporate insights gained from partner expertise and the UMRR Environmental Design Handbook: Poor 1, Fair 13, Well/Very Well 2, Unsure 0
			c) Utilize best available science									Utilize best available science: Poor 1, Fair 15, Well/Very Well 0, Unsure 0
			d) Consult UMRR science experts									Consult UMRR science experts: Poor 3, Fair 13, Well/Very Well 0, Unsure 0
			e) Use existing, or develop new, analytical tools (e.g., models)									Use existing, or develop new, analytical tools (e.g., models): Poor 1, Fair 6, Well/Very Well 9, Unsure 0
			f) Involve project sponsors in identifying and formulating projects									Involve project sponsors in identifying and formulating projects: Poor 3, Fair 11, Well/Very Well 1, Unsure 0
			g) Outreach to potential candidate nonprofit organizations to inform them of the potential to cost share and solicit input				Additional Survey Item: Conduct outreach to potentia candidate nonprofit organizations					Outreach to potential candidate nonprofit organizations to inform them of the potential to cost share and solicit input: Poor 1, Fair 7, Well/Very Well 4, Unsure 4
		2) Consider state and federal agencies' UMR-related plans and strategies (watershed and in-river)	a) Define a process for incorporating UMR-related habitat plans and strategies									Define a process for incorporating UMR-related habitat plans and strategies: Poor 5, Fair 6, Well/Very Well 6, Unsure 0
			b) Develop a reference list of UMR-related habitat plans and strategies (e.g., Landscape Conservation Cooperatives, state wildlife action plans)				Action A and B: Develop a reference list of UMR-related habitat plan and strategies					Develop a reference list of UMR-related habitat plans and strategies (e.g., Landscape Conservation Cooperatives, state wildlife action plans): Poor 1, Fair 3, Well/Very Well 5, Unsure 7
			c) Document and communicate the incorporation of any such ancillary plans and strategies									Document and communicate the incorporation of any such ancillary plans and strategies: Poor 6, Fair 4, Well/Very Well 5, Unsure 0
		3) Ensure proper coordination among all program partners and relevant experts	a) Update the Habitat Planning and Sequencing Framework, including ways to more formally involve key individuals and organizations (e.g., UMRR scientists, nonprofit organizations)									Update the Habitat Planning and Sequencing Framework, including ways to more formally involve key individuals and organizations (e.g., UMRR scientists, nonprofit organizations): Poor 2, Fair 12, Well/Very Well 3, Unsure 0
			b) Use the Habitat Planning and Sequencing Framework to guide interagency coordination and decision-making									Use the Habitat Planning and Sequencing Framework to guide interagency coordination and decision-making: Poor 1, Fair 12, Well/Very Well 4, Unsure 0
		4) Maintain flexibility in sequencing projects to optimize execution	a) Consider administrative factors, such as availability of resources and a project sponsor, regional needs, learning opportunities, and other issues supported by the partnership									Consider administrative factors, such as availability of resources and a project sponsor, regional needs, learning opportunities, and other issues supported by the partnership: Poor 2, Fair 10, Well/Very Well 5, Unsure 0
	Planning and Design	1) Design project features to most effectively advance project goals and objectives	a) Incorporate insights gained from partner expertise and the UMRR Environmental Design Handbook									Incorporate insights gained from partner expertise and the UMRR Environmental Design Handbook: Poor 3, Fair 11, Well/Very Well 3, Unsure 0
			b) Utilize best available science									Utilize best available science: Poor 2, Fair 15, Well/Very Well 0, Unsure 0
			c) Consult UMRR science experts where appropriate									Consult UMRR science experts where appropriate: Poor 2, Fair 14, Well/Very Well 0, Unsure 0
			d) Use existing, or develop new analytical tools; use tools that can also be used in project evaluation									Use existing, or develop new analytical tools; use tools that can also be used in project evaluation: Poor 6, Fair 10, Well/Very Well 1, Unsure 0
			e) Continue to innovate project design and construction									Continue to innovate project design and construction: Poor 5, Fair 10, Well/Very Well 2, Unsure 0
			f) Define appropriate temporal and spatial scales for determining physical and biotic response of habitat project objectives									Define appropriate temporal and spatial scales for determining physical and biotic response of habitat project objectives: Poor 2, Fair 10, Well/Very Well 3, Unsure 2
		2) Develop analytical tools to better estimate future conditions	a) Describe any new modeling needs for the UMRR									Describe any new modeling needs for the UMRR: Poor 10, Fair 6, Well/Very Well 0, Unsure 0
			b) Identify required expertise									Identify required expertise: Poor 1, Fair 4, Well/Very Well 9, Unsure 0
			c) Form working groups containing said expertise									Form working groups containing said expertise: Poor 2, Fair 3, Well/Very Well 8, Unsure 1
			d) Develop and evaluate models									Develop and evaluate models: Poor 3, Fair 2, Well/Very Well 8, Unsure 1
		3) Engage public interests and seek their input	a) Implement the Communications Plan and Implementation Framework (see Goal 3)									Implement the Communications Plan and Implementation Framework (see Goal 3): Poor 2, Fair 6, Well/Very Well 3, Unsure 5
	Operation and Maintenance	1) Perform operation and maintenance to ensure key features are effectively advancing project goals and objectives	a) Seek adequate resources to implement operation and maintenance									Seek adequate resources to implement operation and maintenance: Poor 2, Fair 5, Well/Very Well 2, Unsure 8
			b) Improve reporting operation and maintenance costs and activities into the individual project evaluation reports and the UMRR Database				Additional Survey Item: Improve reporting operation and maintenance costs and activities into the individual project evaluation reports					Improve reporting operation and maintenance costs and activities into the individual project evaluation reports and the UMRR Database: Poor 7, Fair 3, Well/Very Well 6, Unsure 0
			c) Conduct project evaluation reports in five or ten years				Additional Survey Item: Split into two priority actions (5 and 10 years post construction)					Conduct project evaluation reports in five or ten years: Poor 4, Fair 4, Well/Very Well 3, Unsure 4
		2) Evaluate options to better enable project sponsors to completely and effectively implement operation and maintenance	a) Incorporate lessons learned about operation and maintenance needs of various restoration techniques									Incorporate lessons learned about operation and maintenance needs of various restoration techniques: Poor 1, Fair 3, Well/Very Well 10, Unsure 2
			b) Design project features that minimizes both operation and maintenance and first construction costs									Design project features that minimizes both operation and maintenance and first construction costs: Poor 1, Fair 1, Well/Very Well 9, Unsure 3

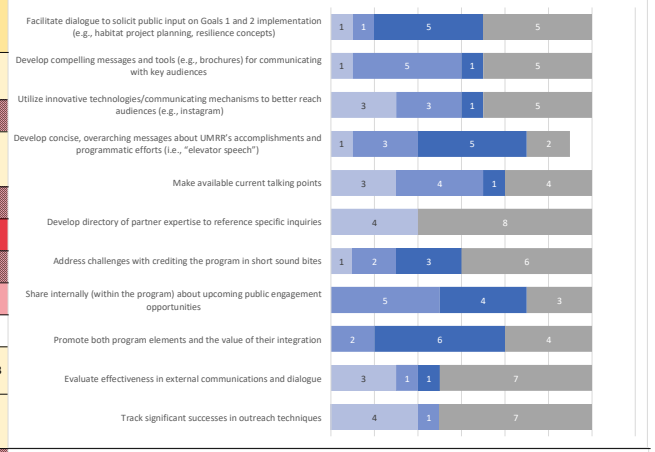
1.1 and 1.2	Partner coordination	Enhance and formalize interagency and interdisciplinary coordination and dialogue about habitat project planning, techniques, and adaptive management, among other things	a) Hold annual in-person meetings of the UMRS Corps District river teams and occasional conference calls when appropriate		Hold annual in-person meetings of the UMRS Corps District river teams and occasional conference calls when appropriate: 12, 2
			b) Conduct at least one annual information exchange meeting between UMRR scientists and restoration practitioners; biennial meetings held in-person		Conduct at least one annual information exchange meeting between UMRR scientists and restoration practitioners; biennial meetings held in-person: 12, 1
			c) Develop and maintain a habitat project status summary that includes reference to critical decision points for project development and adaptive management		Develop and maintain a habitat project status summary that includes reference to critical decision points for project development and adaptive management: 2, 4, 7
	Integration	Enhance integration among the program's various restoration and science efforts	a) Facilitate the inclusion of health and resilience concepts and applications into all aspects of the program		Facilitate the inclusion of health and resilience concepts and applications into all aspects of the program: 4, 10
			b) Enhance internal communications and coordination among all partners (see Goal 4)	Action B: Complete project monitoring reports across districts	Enhance internal communications and coordination among all partners (see Goal 4): 3, 11
			c) Evaluate where better guidance would help restoration practitioners optimize and appropriately utilize the long term resource monitoring database	Additional Survey Item: Develop and maintain a habitat project status summary that includes reference to critical decision points for project development	Evaluate where better guidance would help restoration practitioners optimize and appropriately utilize the long term resource monitoring...: 1, 7, 5, 1
	Database	Centralize databases of project monitoring and evaluation data and other habitat project information	a) Input habitat project monitoring data and insights gained into a central database that is publicly accessible	Need: Centralize project data and collect and digitize historic data currently stored in computers and file cabinets	Input habitat project monitoring data and insights gained into a central database that is publically accessible: 4, 1, 2, 7
			b) Standardize database inputs of project goals, objectives, planning area, project area, project assessments, models uses, and features (e.g., project as-builts)		Standardize database inputs of project goals, objectives, planning area, project area, project assessments, models uses, and features (e.g., project as-builts): 2, 1, 3, 8
	Data Integrity	Ensure project monitoring methods are consistent through time and among projects	a) Review any supplemental, external data to ensure high quality	Need: Establish consistent and standardized HREP monitoring using LTRMs sampling design and protocols	Review any supplemental, external data to ensure high quality
			b) Document methods used in all project monitoring		Document methods used in all project monitoring
1.2	Operationalizing Adaptive Management	1) Operationalize and focus UMRR's adaptive management efforts in an implementation framework	a) Consider when and how to apply certain adaptive management techniques	Strategy: Hold a programmatic discussion on adaptive management to define, operationalize, and implement adaptive management	Consider when and how to apply certain adaptive management techniques: 2, 3, 2, 6
			b) Develop a system for documenting and communicating results and conclusions		Develop a system for documenting and communicating results and conclusions: 4, 3, 1, 5
			c) Notify partners when habitat project performance reports are published		Notify partners when habitat project performance reports are published: 1, 1, 6, 5
			d) Create a central database for habitat project monitoring data that is accessible to all partners		Create a central database for habitat project monitoring data that is accessible to all partners: 3, 1, 8
			e) Integrate results and conclusions in future habitat projects to gain efficiencies	Action E: Undergo a programmatic PER of specific restoration techniques.	Integrate results and conclusions in future habitat projects to gain efficiencies: 3, 1, 4, 5
			f) Estimate and communicate the efficiencies gained through learning		Estimate and communicate the efficiencies gained through learning: 2, 1, 3, 7
			g) Use a habitat project to examine adaptive management implementation questions		Use a habitat project to examine adaptive management implementation questions: 1, 3, 1, 8
			h) Document and communicate the value of learning, including monetizing efficiencies gained		Document and communicate the value of learning, including monetizing efficiencies gained: 2, 1, 4, 6
		2) Implement, and refine as needed, the UMRR's adaptive management framework	a) Establish connections among habitat project planners and scientists		Establish connections among habitat project planners and scientists
		3) Identify important science questions regarding the UMR ecosystem that can be tested at completed and/or future habitat projects (Strategy 3)	a) Define and sequence critical ecological uncertainties at various spatial scales		Define and sequence critical ecological uncertainties at various spatial scales: 2, 1, 4, 5
			b) Develop and use standardized habitat project monitoring protocols to the extent possible		Develop and use standardized habitat project monitoring protocols to the extent possible: 1, 4, 2, 3
			c) Include potential learning opportunities in project fact sheets and feasibility reports		Include potential learning opportunities in project fact sheets and feasibility reports: 1, 5, 1, 3
		1) Apply resilience concepts to UMRR implementation	a) Identify UMR ecosystem resilience definitions based on conceptual models, focused research, and public input	Action A : Crosswalk indicators from resilience assessment, HNA-II, and Status and Trends	Identify UMR ecosystem resilience definitions based on conceptual models, focused research, and public input: 1, 11, 1
			b) Develop conceptual models for applying resilience concepts to the UMR	Action B: Develop reach or pool-scale conceptual models that can be applied at a localized scale.	Develop conceptual models for applying resilience concepts to the UMR: 3, 9, 1
			c) Use the conceptual models to guide development of indices of resilience and evaluation of connections between restoration efforts and resilience	Action C : Connect resilience concepts with ongoing and future restoration work.	Use the conceptual models to guide development of indices of resilience and evaluation of connections between restoration efforts and resilience: 1, 3, 6, 3
			d) Consult UMR restoration experts		Consult UMR restoration experts: 12, 1
			e) Test hypotheses derived from conceptual models through focused research and monitoring of habitat projects		Test hypotheses derived from conceptual models through focused research and monitoring of habitat projects: 1, 8, 4

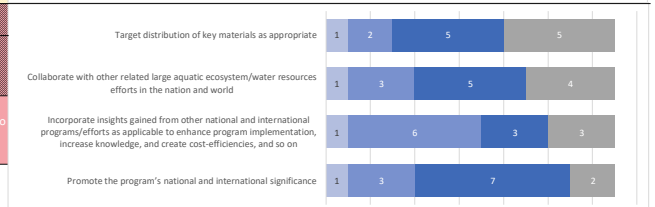
2.1	Assessing Ecosystem Health and Resilience	2) Assess and detect changes in UMR ecosystem health and resilience	a) Continue long term resource monitoring, including land cover/land use every ten years		
			b) Use the long term resource monitoring data and analysis for assessment purposes		
			c) Refine definitions of indicators of ecological health		
			d) Evaluate the status and trends of indicators of ecological health and resilience at appropriate scales (Status and Trends Report and other publications)		
			e) Maintain the long term resource monitoring database in order ensure its availability to the public in perpetuity		
			f) Evaluate effects of selected restoration techniques and approaches on selected indicators of ecological health and resilience at appropriate scales	Action F: Critically review past restoration work to assess best practices.	
		3) Conduct scientific analysis, research, and modeling to gain knowledge about the UMR's ecological health and resilience	a) Develop research frameworks that link science monitoring, research, analyses, and where appropriate, restoration efforts		
			b) Consult with UMR restoration practitioners as appropriate		
			c) Identify additional monitoring components needed to better understanding key ecological processes, functions, structures, and composition	Action C: Evaluate additional components for monitoring including forests, invertebrates, geomorphology, toxic chemicals, and wildlife to better understand key ecological process, functions, and structures.	
			d) Continue to develop novel, informative, analytical methods for understanding the health and resilience of the UMR		
			e) Use existing, or develop new, analytical tools (e.g., models)		
2.1 and 2.2	Integration	Enhance integration among the program's various restoration and science efforts	a) Facilitate the inclusion of health and resilience concepts and applications into all aspects of the program	Need: Review integrity, archiving, and accessibility of data from science in support of restoration projects.	
			b) Improve internal communications and coordination (see Goal 4)		
			c) Provide learning sessions regarding accessibility and usability of the long term resource monitoring database		
			d) Facilitate the appropriate use of available data in habitat project planning and evaluation by improving communication between restoration practitioners and UMRR scientists		
			e) Evaluate where better guidance would help restoration practitioners optimize and appropriately utilize the long term resource monitoring database		
	Data Integrity	Ensure methods remain consistent through time	a) Field stations and UMESC LTRM PIs meet in-person regularly to ensure consistency in methods		
			b) Hold biennial component meetings		
2.2	Knowledge to Improve and Inform UMR Ecosystem Management and Restoration	1) Address restoration and UMR ecosystem management questions through science analysis and research	a) Continue to develop novel, informative, analytical methods for understanding the health and resilience of the UMR		
			b) Identify and better understand current and emerging stressors (or drivers) to the UMR ecological health and resilience		
		2) Continue improvement of management actions and restoration approaches	a) Conduct well-designed studies of select habitat projects and management actions that examine their effects in the context of ecological health and resilience		
			b) Define appropriate temporal and spatial scales for determining physical and biotic response of habitat project objectives		
		3) Effectively communicate relevant research findings to habitat project planners and river managers	a) See Goal 4 for interactions between science- and habitat-related implementing partners		
			b) Distribute clear, concise summaries of scientific findings to program partners		
3.1, 3.2, 3.3	Communication Plan	Coordinate and commit resources to UMRR's external engagement and outreach	a) Establish a standing communications team to implement Goal 3	Strategy: Finalize the UMRR communications and outreach plan to focus and enhance external communication	
				Strategy: Assemble a one- to two-page scope of work to capture intended efforts under Goal 3	
		Develop a UMRR external communications plan	a) Focus external outreach efforts based on prioritized ecological drivers that affect the Upper Mississippi River ecosystem health	Action A: Modify conceptual models for public facing communication purposes	
			b) Assess external users' information and engagement needs and preferred delivery methods		
			c) UMRR Coordinating Committee and A-Team agendas regularly include opportunities to discuss outreach and external engagement ideas		
			d) Review and update UMRR web sites at least quarterly	Action D: Add a "if you only have a minute" section to the UMRR website	

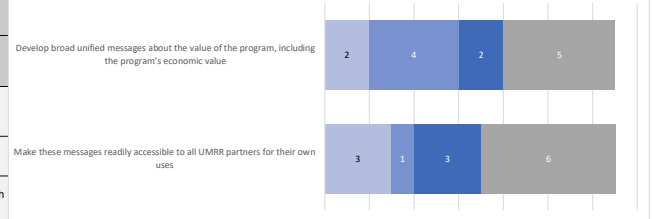


3.1	**Strategic Engagement and Outreach (Collaborating with others to optimize and leverage UMRR's resources**	Focus and enhance engagement and collaboration and dialogue in a communications plan and implementation framework	a) Identify key organizations and individuals to directly engage and seek knowledge	Action A: Conduct targeted outreach to inform USDA-NRCS and FSA of recently identified HREPs
				Action A and F: Targeted outreach to connect watershed groups with LTRM data to help track progress from watershed restoration efforts.
			b) Assess information and engagement needs of key organizations and individuals	
			c) Determine preferred information delivery methods of key organizations and individuals	
			d) Develop compelling messages and various tools for communicating with key audiences (See Objective 3.2 actions)	Action D: Simplify concepts of ecological resilience and HNA-II indicators for use in communication materials
			e) Prioritize external engagement and collaboration	Action D and E: Distribute fact sheets on program impact by congressional district more broadly
			f) Create collaborative exchanges with other basin restoration programs to improve outcomes for all programs, especially NRCS-RCPP, and potentially USEPA	Action F: Evaluate the use of LTRM data in nutrient reduction assessments.
				Action F: Link together habitat restoration projects with existing watershed projects and upstream contributors.
			g) Promote both program elements and develop a message that conveys the value of their integration	
3.2	**External Communication and Dialogue (Outreach to public, elected officials, etc.)**	Focus and enhance external communication in a communications plan and implementation framework	a) Facilitate dialogue to solicit public input on Goals 1 and 2 implementation (e.g., habitat project planning, resilience concepts)	Need: Develop a pool-scale pilot engagement strategy to address watershed influences
			b) Develop compelling messages and tools (e.g., brochures) for communicating with key audiences	Action B: Develop a two-pager to explain the history and establishment of UMRR
			c) Utilize innovative technologies/communication mechanisms to better reach audiences (e.g., instagram)	
			d) Develop concise, overarching messages about UMRR's accomplishments and programmatic efforts (i.e., "elevator speech")	Action D: Create a UMRR Program Flyer with "elevator speech." (FLYER CREATED 2021)
			e) Make available current talking points	
			f) Develop directory of partner expertise to reference specific inquiries	
			g) Address challenges with crediting the program in short sound bites	
			h) Share internally (within the program) about upcoming public engagement opportunities	
			i) Promote both program elements and the value of their integration	
			j) Evaluate effectiveness in external communications and dialogue	Action J and K: Assemble a one- to two-page scope of work to capture intended efforts under Goal 3
			k) Track significant successes in outreach techniques	Action K: Track LTRM Manuscript citations by geographic location to assess reach of science information nationally and internationally.
3.3	**National and International Exchanges**	Focus and enhance knowledge exchange with other organizations and individuals nationally and internationally in a communications plan and implementation framework	a) Target distribution of key materials as appropriate	
			b) Collaborate with other related large aquatic ecosystem/water resources efforts in the nation and world	Additional Survey Item: Collaborate with other related arge aquat c ecosystem/water resources efforts in the nation and world to share knowledge
			c) Incorporate insights gained from other national and international programs/efforts as applicable to enhance program implementation, increase knowledge, and create cost-efficiencies, and so on	Additional Survey Item: Incorporate insights gained from other nat onal and internat onal programs to enhance program implementation
			d) Promote the program's national and international significance	
4.1	**Partnership Vision**	Partners communicate compelling and consistent messages about the program to their respective agencies	a) Develop broad unified messages about the value of the program, including the program's economic value	Strategy: Undergo programmatic strategic planning to address increased authorization
				Strategy: Create a narrative around missed restoration opportunities because of existing policies
				Action A: Gather information on how HREPs contribute to local economies
			b) Make these messages readily accessible to all UMRR partners for their own uses	Action A: Update existing information on economic value of UMRR to the region
				Action A and B and 4.B.1.D: Maintain an annual narrative of accomplishments made in alignment with the strategic plan

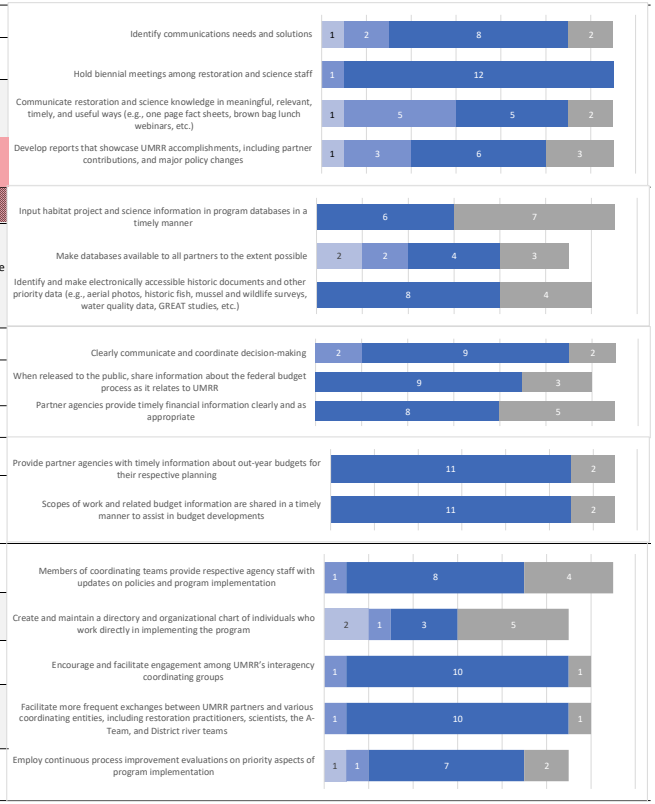








4.1	Partner Communication	1) Enhance internal communication among all partners	a) Identify communications needs and solutions	
			b) Hold biennial meetings among restoration and science staff	
			c) Communicate restoration and science knowledge in meaningful, relevant, timely, and useful ways -One page fact sheets, brown bag lunch webinars, etc.	Action C: Establish a UMRR brown bag webinar series
			d) Develop reports that showcase UMRR accomplishments, including partner contributions, and major policy changes	
		2) Maintain, and make readily available, programmatic information	a) Input habitat project and science information in program databases in a timely manner	
			b) Make databases available to all partners to the extent possible	Action B and C: Provide and manage a central repository for agency reports and data that is accessible to the Partnership
			c) Identify and make electronically accessible historic documents and other priority data (e.g., aerial photos, historic fish, mussel and wildlife surveys, water quality data, GREAT studies, etc.)	
4.1 and 4.2	Transparency and Accountability	1) Maintain good, working relationships among partners that foster trust and collaboration	a) Clearly communicate and coordinate decision-making	
			b) When released to the public, share information about the federal budget process as it relates to UMRR	
			c) Partner agencies provide timely financial information clearly and as appropriate	
		2) Provide relevant and timeline information necessary to allow for effective and efficient resource planning	a) Provide partner agencies with timely information about out-year budgets for their respective planning	
			b) Scopes of work and related budget information are shared in a timely manner to assist in budget developments	
4.2	Partner Coordination	Ensure all partners are provided with information needed to implement UMRR as described in program planning documents	a) Members of coordinating teams provide respective agency staff with updates on policies and program implementation	
			b) Create and maintain a directory and organizational chart of individuals who work directly in implementing the program	Action B: Create a directory of UMRR program partners
			c) Encourage and facilitate engagement among UMRR's interagency coordinating groups	
			d) Facilitate more frequent exchanges between UMRR partners and various coordinating entities, including restoration practitioners, scientists, the A-Team, and District river teams	Action D: Coordinate LTRM visits to various HREPs
			e) Employ continuous process improvement evaluations on priority aspects of program implementation	



ATTACHMENT C

Communications and Outreach

- **UMRR Flyer (7/23/2021)** *(C-1 to C-2)*

Upper Mississippi River Restoration

Leading · Innovating · Partnering

For over 35 years, the Upper Mississippi River Restoration program partnership has **implemented innovative and sustainable restoration, research, and monitoring** techniques for a healthier Upper Mississippi River System.

photo by Robert J. Hurt

A WORKING RIVER IN NEED

The mighty Mississippi River is one of the world's most famous rivers, flowing through America's heartland to the Gulf of Mexico. It provides critical and nationally important :

- Drinking water & power supply
- Recreation & ecotourism
- Habitat for fish & wildlife
- Commercial navigation & transporation

Dams & levees, climate change, and land use changes in the Upper Mississippi River System contribute to: *altered water cycle, decreased amount and quality of habitat, and reduced water quality.*

A partnership of federal and state agencies, non-governmental organizations, and individuals work together to address these past and ongoing challenges through the Upper Mississippi River Restoration (UMRR) program.

The UMRR program supports Upper Mississippi River restoration, research, and monitoring.

RESTORING OUR RIVER

Through Long Term Resource Monitoring (LTRM) and Habitat Rehabilitation and Enhancement Projects (HREPs), the UMRR program successfully restores habitat to combat degradation.

WHY MONITOR? By collecting and evaluating LTRM water, fish, land use, and vegetation data over decades, scientists can assess the health of the river and target habitat restoration projects and management actions for the greatest benefit of the river and the public.

WHY RESTORE? Humans have changed the river; habitat restoration techniques address the negative impacts of past and ongoing changes.

Connecting and Protecting the Upper Mississippi River System in

5 STATES

through

- shoreline protection
- island creation
- water level management
- dredging
- habitat enhancement

The UMRR program uses state-of-the-art research and monitoring to understand changing environmental conditions of the river. Using effective and science-based restoration methods, the UMRR supports a healthier and more resilient Upper Mississippi River System.

US Army Corps of Engineers · USDA · NGO's · PUBLIC · UMRBA Upper Mississippi River Basin Association · US science for a changing world

Upper Mississippi River Restoration
Leading · Innovating · Partnering

The Upper Mississippi River System is a
NATIONALLY SIGNIFICANT RESOURCE

NATURAL RESOURCES

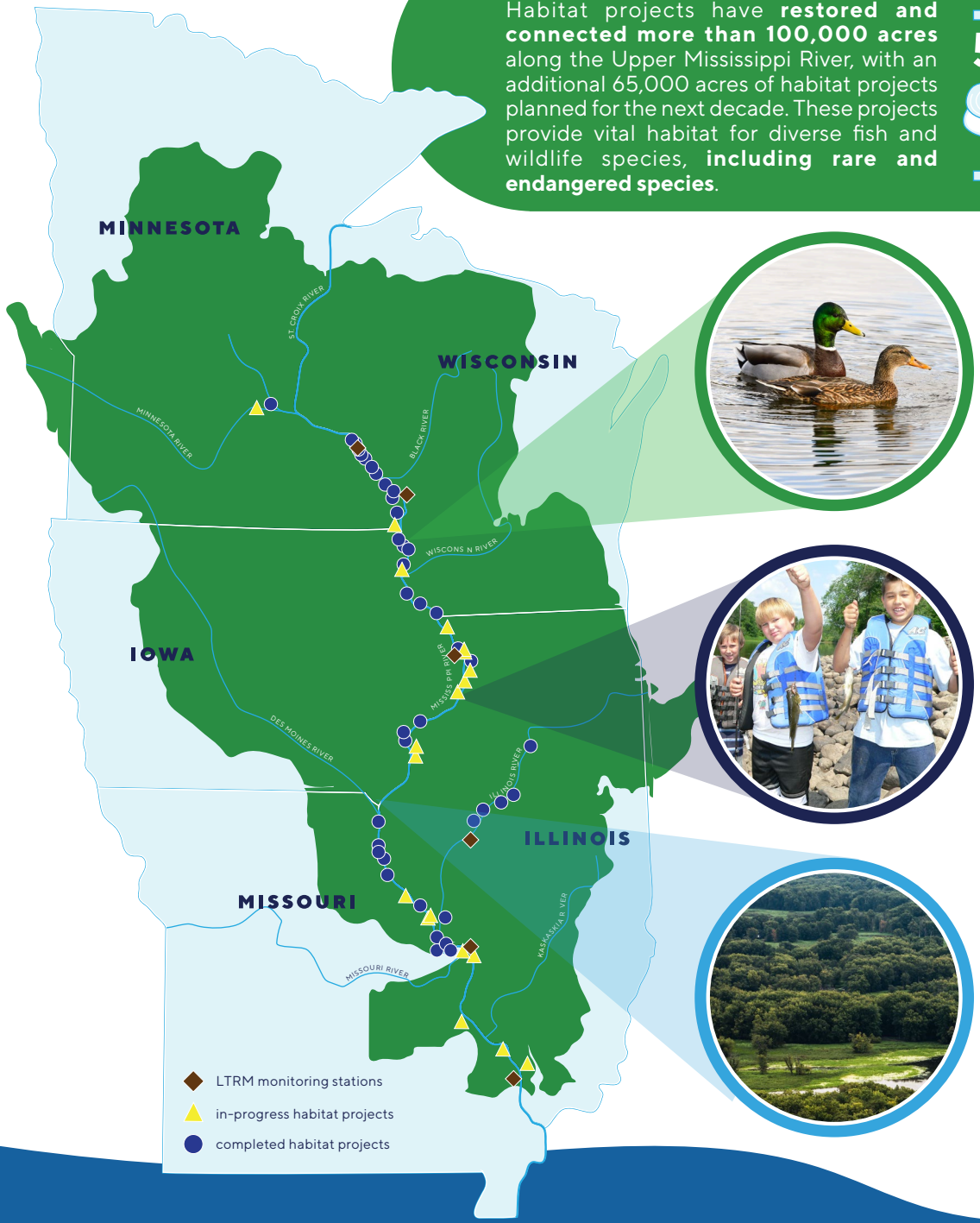
Habitat projects have **restored and connected more than 100,000 acres** along the Upper Mississippi River, with an additional 65,000 acres of habitat projects planned for the next decade. These projects provide vital habitat for diverse fish and wildlife species, **including rare and endangered species**.

FISH & WILDLIFE

50 mussels

154 fish

325 birds



BIRDS

More than 40% of North American migrating birds use the Mississippi River corridor as their migration route. Restoring forests and wetlands improves bird habitat and provides opportunities for hunting and birdwatching.

AQUATIC LIFE

Wetlands and backwater lakes provide habitat for many valued fish and aquatic species. Millions of people enjoy fishing and boating on the Upper Mississippi River System each year.

FORESTS

Forest corridors provide habitat for wildlife species, opportunities for wildlife viewing and hunting, and connect communities and animals to the river. The health of floodplain forests and wet prairies along the river contribute to improved quality of drinking water for millions of people.

The Upper Mississippi River System provides cultural, recreational, ecological, and economic value to communities and Tribal Nations who reside in the river's watershed. The UMRR program and partnership improves and supports these values for present and future generations.

ATTACHMENT D

Program Reports

- **Long Term Resource Monitoring and Science**
  - **Base Monitoring Scope of Work thru 3rd Quarter of FY 2021 (7/26/2021)** *(D-1 to D-5)*
  - **FY 2021 UMRR Science Activities in Support of Restoration and Management (7/26/2021)** *(D-6 to D-14)*
  - **FY 2014 and FY 2015 UMRR Science Activities in Support of Restoration and Management (7/26/2021)** *(D-15)*
- **LTRM Implementation Planning**
  - **UMRR LTRM Implementation Planning Update** *(D-16)*
  - **Potential Facilitator Bios**
    - **Max Post van der Burg, USGS** *(D-17)*
    - **Dave Smith, USGS** *(D-18 to D-19)*
  - **LTRM Implementation Planning Guidance Document (7/23/2021)** *(D-20 to D-21)*

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Aquatic Vegetation Component						
2021A1	Complete data entry and QA/QC of 2020 data; 1250 observations.					
	a. Data entry completed and submission of data to USGS	30-Nov-2020		30-Nov-2020		Lund, Drake, Bales
	b. Data loaded on level 2 browsers	15-Dec-2020		15-Dec-2020		Schlifer
	c. QA/QC scripts run and data corrections sent to Field Stations	28-Dec-2020		28-Dec-2020		Sauer, Schlifer
	d. Field Station QA/QC with corrections to USGS	15-Jan-2021		15-Jan-2021		Lund, Drake, Bales
	e. Corrections made and data moved to public Web Browser	30-Jan-2021		30-Jan-2021		Larson, Schlifer, Caucutt
2021A2	Web-based: Creating surface distribution maps for aquatic plant species in Pools 4, 8, and 13; 2020 data	31-Jul-2021				Larson, Schlifer
2021A3	Wisconsin DNR annual summary report 2020 that combines current year observations from LTRM with previous years' data, for the fish, aquatic vegetation, and water quality components.	30-Sep-2021				Drake, Bartels, Hoff, Kalas, Carhart
2021A4	Complete aquatic vegetation sampling for Pools 4, 8, and 13 (Table 1)	31-Aug-2021				Larson, Lund, Drake, Fopma
2021A5	Pool 4: Graphical summary and maps of aquatic vegetation current status and long-term trends.	30-Dec-2021				Lund
2021A6	Pool 8: Graphical summary and maps of aquatic vegetation current status and long-term trends.	30-Dec-2021				Drake, Carhart
Intended for distribution						
LTRM completion report: Evaluation of a "Trace" Plant Density Score in LTRM Vegetation Monitoring (New Milestone 2020BIO3a; sent to authors for revisions)						
Manuscript: Estimated annual summer submersed aquatic macrophyte standing stocks (1998 - 2018) in three large reaches of the Upper Mississippi River. (2020A8; at journal for review, IP-122160)						
Manuscript: Species-specific wet-dry mass calibrations for common submersed macrophytes in the Upper Mississippi River (2020A9; Completed: Aquatic Botany Volume 169, https://doi.org/10.1016/j.aquabot.2020.103344)						

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Fisheries Component						
2021B1	Complete data entry, QA/QC of 2020 fish data; ~1,590 observations					
	a. Data entry completed and submission of data to USGS	31-Jan-2021		31-Jan-2021		DeLain, Bartels, Bowler, Hine, Kueter, Gittinger, West, Solomon, Maxson
	b. Data loaded on level 2 browsers; QA/QC scripts run and data corrections sent to Field Stations	15-Feb-2021		15-Feb-2021		Ickes, Schlifer
	c. Field Station QA/QC with corrections to USGS	15-Mar-2021		15-Mar-2021		DeLain, Bartels, Kueter, Hine, Gittinger, West, Solomon, Maxson
	d. Corrections made and data moved to public Web Browser	30-Mar-2021		30-Mar-2021		Ickes and Schlifer
2021B2	Update Graphical Browser with 2020 data on Public Web Server.	31-May-2021		31-May-2021		Ickes and Schlifer
2021B3	Complete fisheries sampling for Pools 4, 8, 13, 26, the Open River Reach, and La Grange Pool (Table 1)	31-Oct-2021				DeLain, Bartels, Kueter, Hine, Gittinger, West, Solomon, Maxson
2021B4	IDNR Fisheries Management State Report: Fisheries Monitoring in Pool 13, Upper Mississippi River, 2020	30-Jun-2021	TBD			Kueter
2021B5	Sample collection, database increment on Asian carp age and growth: collection of cleithral bones	31-Jan-2021		31-Jan-2021		Solomon, Maxson
2021B8(D)	Database increment: Stratified random day electrofishing samples collected in Pools 9–11	30-Sep-2021				Kueter
2021B9(D)	Database increment: Stratified random day electrofishing samples collected in Pools 16–18	30-Sep-2021				Kueter
Intended for distribution						
LTRM Completion report, compilation of 3 years of sampling: Fisheries (2009R1Fish; Chick et al.) (in USGS review; minor grammatical corrections needed then will be posted on LTRM Fish page)						
Manuscript: A synthesis on river floodplain connectivity and lateral fish passage in the Upper Mississippi River (2021B11; Submitted to USGS review; IP-123678)						
LTRM Fact Sheet: Tree map tool for visualizing fish data, with example of native versus non-native fish biomass (2013B16) (Programming code for TreeMap being re-written; once completed Fact Sheet will be completed)						

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Water Quality Component						
2021D1	Complete calendar year 2020 fixed-site and SRS water quality sampling	31-Dec-2020		31-Dec-2020		Jankowski, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Fulgoni
2021D2	Complete laboratory sample analysis of 2020 fixed site and SRS data; Laboratory data loaded to Oracle data base.	15-Mar-2021		15-Mar-2021		Yuan, Schlifer
2021D3	1st Quarter of laboratory sample analysis (~12,600)	30-Dec-2020		30-Dec-2020		Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Cook, Fulgoni
2021D4	2nd Quarter of laboratory sample analysis (~12,600)	30-Mar-2021		30-Mar-2021		Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Fulgoni
2021D5	3rd Quarter of laboratory sample analysis (~12,600)	29-Jun-2021		29-Jun-2021		Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Fulgoni
2021D6	4th Quarter of laboratory sample analysis (~12,600)	28-Sep-2021				Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Fulgoni
2021D7	Complete QA/QC of calendar year 2020 fixed-site and SRS data.					
	a. Data loaded on level 2 browsers; QA/QC scripts run; SAS QA/QC programs updated and sent to Field Stations with data.	30-Mar-2021		30-Mar-2021		Schlifer, Jankowski
	b. Field Station QA/QC; USGS QA/QC.	15-Apr-2021		15-Apr-2021		Jankowski, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Fulgoni
	c. Corrections made and data moved to public Web Browser	30-Apr-2021		30-Apr-2021		Schlifer, Jankowski
2021D8	Complete FY2020 fixed site and SRS sampling for Pools 4, 8, 13, 26, Open River Reach, and La Grange Pool	30-Sep-2021				Jankowski, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Fulgoni
2021D9	WEB-based annual Water Quality Component Update w/2020 data on Server.	30-May-2021		30-May-2021		Schlifer, Jankowski
2021D10	Operational Support to the UMRR LTRM Element. Serve as in-house Field Station for USGS for consultation and support on various LTRM-wide topics	30-Sep-2021				Kalas, Hoff, Bartel, Drake

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
On-Going						
2019D12	Draft LTRM Completion Report: Assessment of Phytoplankton Samples collected by the Upper Mississippi River Restoration Program-Long Term Resource Monitoring Water Quality Component	30-Dec-2019	30-Sep-2021		Contractor delay	Fulgoni and Jankowski
2020D12	Final LTRM Completion Report: Assessment of Phytoplankton Samples collected by the Upper Mississippi River Restoration Program-Long Term Resource Monitoring Water Quality Component	30-Mar-2021	30-Dec-2021			Fulgoni and Jankowski
2017D10	Draft LTRM Completion report: Evaluation of water quality data from automated sampling platforms	30-Sep-2017	30-Dec-2021		Delayed, Lubinski took new position	Soeken-Gittinger, Lubinski, Chick, Houser
Intended for distribution						
Completion report, compilation of 3 years of sampling: Water Quality (2009R1WQ; Giblin, Burdis) (in USGS review; minor grammatical corrections needed then will be posted on LTRM WQ page)						
Manuscript: Nutrients and dissolved oxygen in the UMRS: improving our understanding of winter conditions and their implications for structure and function of the river (2014D12; Houser) (under revision)						
Spatial Data Component						
2021SD1	Aerial Photo scanning (ILR)	30-Sep-2021				Strange
2021SD2	3D Vegetation Mapping Solution Report	30-Jun-2021	TBD		Delayed due to lack of computer hardware, ready to proceed when graphics cards and VR headsets are available	Finley
2021SD3	4-Band to 3D Product SOP	30-Jun-2021		30-Jun-2021	Exploring ways to host the technical reports on-line	Finley
2021SD4	Google Earth Help Webpage	31-Dec-2020		31-Dec-2020	Exploring ways to host on-line	Finley
2021SD5	Co-Located Aerial LIDAR/SAR Report	30-Sep-2021				Finley
2021SD6	Survey Capability Report and Historic Spatial Database for LCU Mapping	31-Dec-2020			Fieldwork to be completed by 6-August 2021	Finley
2021SD7	Topobathy strategic plan	30-Sep-2021				Strange, De Jager
2021SD8	Maintenance ArcGIS server	30-Sep-2021				Hlavacek, Fox, Rohweder
2021SD9	Status and Trends Report: continued data analysis and report writing for status and trends in land / water cover indicators.	30-Sep-2021				De Jager
2021SD10	Draft Report: Evaluating effects of alternative flooding scenarios on forest succession and landcover in the UMRS.	30-Sep-2021				De Jager

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Data Management						
2021M1	Update vegetation, fisheries, and water quality component field data entry and correction applications.	30-May-2021		30-May-2021		Schlifer
2021M2	Load 2020 component sampling data into Database tables and make data available on Level 2 browsers for field stations to QA/QC.	30-Jun-2021		30-Jun-2021		Schlifer
2021M3	Assist LTRM Staff with development and review of metadata and databases in conjunction with publishing of reports and manuscripts	On-going				Schlifer
Status and Trends 3rd edition						
2021ST1	Draft Report out for Peer Review	16-Oct-2020	4-Nov-2020	4-Nov-2020		All
2021ST2	Revised draft to USGS publishing network	26-Feb-2021	30-May-2021	19-Apr-2021		All
2021ST3	Revised draft to UMESC Center Director and USGS Bureau Approving Official	23-Apr-2021	30-Jun-2021			All
2021ST4	Final publication	28-May-2021				All
2020ST4	Draft S&T3 Fact Sheet	TBD			Tied to completion of S&T3	All
Quarterly Activities						
2021QR1	Submittal of quarterly activities	30-Jan-2021		30-Jan-2021		All
2021QR2	Submittal of quarterly activities	13-Apr-2021		13-Apr-2021		All
2021QR3	Submittal of quarterly activities	13-Jul-2021				All
2021QR4	Submittal of quarterly activities	12-Oct-2021				All
Equipment Inventory						
2021ER1	Property inventory and tracking	15-Nov-2021				LTRM staff as needed
UMRR LTRM Virtual All-Hands Component Meeting						
2021VAH1	Virtual All-Hands Component Meeting	30-31 March 2021		30-31 March 2021		All

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Developing and Applying Indicators of Ecosystem Resilience to the UMRS						
2021R1	Updates provided at quarterly UMRR CC meeting and A team meeting as appropriate	Various				Bouska, Houser
2021R2	Submit aquatic vegetation manuscript for peer review publication	30-Mar-2021		1-Feb-2021		
2021R3	Submit resilience assessment synthesis manuscript for peer review publication	30-Mar-2021	30-Sep-2021	Is being split to 2 manuscripts. Currently working on a managment implications manuscript		
2021R4	Submit resilience assessment synthesis fact sheet for USGS peer review	30-Sep-2021				
2021R5	Submit manuscript that investigates associations between general and specified resilience for peer review publication	30-Sep-2021				
Intended for Distribution						
Manuscript: Bouska, K. L., J. N. Houser, N. R. De Jager, D. C. Drake, S. F. Collins, D. K. Gibson-Reinemer, and M. A. Thomsen. Conceptualizing alternate regimes in a large floodplain-river ecosystem. Journal of Environmental Management Volume 264 https://doi.org/10.1016/j.jenvman.2020.110516						
Assessing recent rates of sedimentation in the backwaters of Pools 4, 8, and 13 to support river restoration and the Habitat Needs Assessment-II						
2018ST3	Over-ice surveys completed along with a database (Continuation of 2017ST3)	30-Mar-2018	30-Mar-2020	Pool 13 Delayed due to Covid-19 state travel restrictions, now tracking via 2019GC6		Moore, Kalas, Bierman
Landscape Pattern Research and Application						
2021LP1	Geospatial analyses in support of the Forest Gap project	30-Aug-21				Rohweder
2021LP2	Support for developing topobathymetry plan	30-Sep-21				Stone et al.
2021LP3	Analysis; Evaluating effects of alternative flooding scenarios on forest succession in the UMRS. Potential manuscript in 2021	30-Sep-21				Rohweder
2021LP4	Data Development: Developing seasonal aquatic areas maps to support aquatic habitat mapping and analysis.	30-Sep-21				Rohweder
On-Going						
Manuscript: Review of Landscape Ecology on the UMR; De Jager; 2016L3						

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Eco-hydrologic Research						
2020EH02	Submit manuscript of temporal patterns in UMRS inundation regimes for peer review	30-Sep-21				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-21				Van Appledorn, Jankowski
2021EH02	Draft manuscript of UMRS floodplain forest classification	30-Sep-21				Van Appledorn, De Jager
2021EH03	Spatial analyses of UMRS geomorphic channel and/or delta features (e.g., slope, width, complexity, geomorphons, shoaling, etc.) to understand hydrogeomorphic constraints on river form and function	30-Sep-21				Van Appledorn
On-Going						
Development of UMRS inundation model query tool; Van Appledorn, Fox, Rohweder, De Jager; 2019EH03						
Manuscript: Van Appledorn, M., De Jager, N.R. Considerations for improving floodplain research and management by integrating inundation modeling, ecosystem studies, and ecosystem services (2016L5; see 2019EH01) (Resubmitted to journal after revisions)						
Intended for distribution						
Manuscript: Modeling and mapping inundation regimes for ecological and management applications: a case study of the Upper Mississippi River floodplain, USAVan Appledorn, De Jager, Rohweder Research and Applications, Early View On-Line Special Edition. http://dx.doi.org/10.1002/rra.3628 Location of supporting data: https://doi.org/10.5066/F7VD6XRT)						
Acquisition and Interpretation of Imagery for Production of 2020 UMRS Land Cover/Land Use Data and Pool-Based Orthomosaics						
2020LCU2	Image processing, stereo model development, orthorectification, pool-based mosaicking, image interpretation, QA/QC, and serving of 2020 LCU datasets for Pools 4, 8, 13, 26, La Grange, and an estimated 80% of the Open River South	1-Sep-2021				Dieck, Hop
2020LCU3	Image processing, stereo model development, orthorectification, pool-based mosaicking, image interpretation, automation, QA/QC, and serving of 2020 LCU datasets for remaining 50% of Open River South, the Alton Pool of the Illinois River, and Pools 9-12	1-Sep-2022				Dieck, Hop
2020LCU4	Image processing, stereo model development, orthorectification, pool-based mosaicking, image interpretation, automation, QA/QC, and serving of 2020 LCU datasets for Pools 1-3, 5-7, the St. Croix and lower Minnesota Rivers, and the Peoria Pool of the Illinois River	1-Sep-2023				Dieck, Hop

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Aquatic Vegetation, Fisheries, and Water Quality Research						
Intended for Distribution						
Manuscript: Estimated annual summer submersed aquatic macrophyte standing stocks (1998 - 2018) in three large reaches of the Upper Mississippi River. (2020A8; USGS review; Drake, Lund, Bales, Kreiling; IP-122160)						
Manuscript: Species-specific wet-dry mass calibrations for common submersed macrophytes in the Upper Mississippi River (2020A9; Lund and Drake) Completed: https://doi.org/10.1016/j.aquabot.2020.103344						
Fisheries						
On-Going						
LTRM completion report: Exploring Years with Low Total Catch of Fishes in Pool 26; 2016B14; Gittinger, Chick (Submitted to USGS 21 February 2021)						
Manuscript: Evidence of functionally defined non-random fish community responses over 25 years in a large river system (Ickes; 2019B13 replacing 2015B17 and 2016B17; Not accepted at journal, resubmitting to Hydrobiologia)						
LTRM Completion Report: Developing a biochronology of smallmouth buffalo growth for the Upper Mississippi and Illinois Rivers, Ickes with Solomon (2020B12; tied to 2018SMBF4) Sent to Partnership 10-9-2020						
Water Quality						
Intended for Distribution						
Manuscript: The ecology of ice across the river continuum (New tracking number 2021RC1) Authors review the literature on how river ice processes and their impact on ecological processes differ between rivers. Submitted to JGR Biogeosciences						
Manuscript: Warmer winters increase phytoplankton biomass in a large floodplain river. (Jankowski, Kathi Jo; Houser, Jeff N.; Schuerell, Mark D.; Smits, Adrianne P.; reconcilation to journal, 7 June, IP-124099)						
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: Model selection for ecological community data using tree shrinkage priors; Gray, Hefley, Zhang, Bouska; (2017FA2; IP-111931; in revision with Ecological Applications)						
Manuscript: Probabilities of detecting submersed aquatic vegetation species using a rake method may vary with biomass; 2020E1; Completed; Aquatic Botany, 171:103375, https://doi.org/10.1016/j.aquabot.2021.103375						
Pool 12 Overwintering HREP Adaptive Management Fisheries Response Monitoring						
Fisheries Population Monitoring						
2021P13d	Age determination of bluegills	1-Feb-21			Delayed due to retirement of Bowler	Kueter
2021P13e	In-house project databases updated	31-Mar-21			Delayed due to	Kueter
2021P13f	Summary letter compiled and made available to program partners	30-Sep-21				Kueter

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Pool 4 - Peterson Lake HREP Water Quality Monitoring – Pre and Post-Adaptive Management Evaluation						
2017PL5	Summary letter: Tabular and graphical summary of water quality data	Dec. 2020		19-Jan-21		Burdis, Lund, Moore
FY18 Funded Science in Support of Restoration and Management Proposals						
Conceptual Model and Hierarchical Classification of Hydrogeomorphic Settings in the UMRS						
2019CM4	GIS data base and query tool	31-Dec-2019	On-going		Prototype developed	Fitzpatrick, Henderson, Rogala, Erwin, Sawyer, Strange
2019CM5	Submit draft LTRM Completion report on hydrogeomorphic conceptual model and hierarchical classification system	31-Dec-2019	30-Aug-2020			Fitzpatrick, Henderson, Rogala, Erwin, Sawyer, Strange
2019CM6	Submit Final LTRM Completion report on hydrogeomorphic conceptual model and hierarchical classification system	30-Jun-2020	30-Dec-2020			Fitzpatrick, Henderson, Rogala, Erwin, Sawyer, Strange
Develop a better understanding of geomorphic changes through repeated measurement of bed elevation and overlay of land cover data						
Determine geomorphic changes in selected side channels of selected reaches using hydroacoustics						
2021GC1	Final Completion Report; IP-121033	28-Apr-2021		23-Apr-2021	Waiting for data release	Strange
Establish a network of transects in backwaters to measure sedimentation						
2019GC6	Complete setting monuments and surveying remaining transects	30-Sep-2020		This work delayed until discussions can be held on methodolgies etc.		Kalas
2019GC7	Complete database for all transects.	30-Sep-2020				Kalas
Water Exchange Rates and Change in UMRS Channels and Backwaters, 1980 to Present						
2019WE2	Base Maps of Discharge Measurement Location	31-May-2019	31-May-2021			Le Claire
2019WE3	Submit draft LTRM Completion Report	30-Sep-2019	30-Sep-2021			Hendrickson
2019WE4	Submit Final LTRM Completion Report	30-Mar-2020	30-Dec-2021			Hendrickson
Intrinsic and extrinsic regulation of water clarity over a 950-km longitudinal gradient of the UMRS						
2019IE3	Submit Draft manuscript	30-Mar-2020	TBD	PIs determined that to move forward biomass information is needed. Will continue work once biomass model complete		Drake, Carhart and others
2019IE4	Submit Final manuscript	30-Dec-2020				Drake, Carhart and others
Effectiveness of Long Term Resource Monitoring vegetation data to quantify waterfowl habitat quality						
Thesis; 2019WF8; Schmidt, Straub, Schultz (Undergoing revision)						
Understanding constraints on submersed vegetation distribution in the UMRS: the role of water level fluctuations and clarity						
Manuscript: Understanding Constraints on Submersed Vegetation Distribution in a Large, Floodplain River: the Role of Water Level Fluctuations, Water Clarity and River Geomorphology; Carhart et al., Wetlands volume 41, Article number: 57; https://doi.org/10.1007/s13157-021-01454-1. Data available at: https://www.sciencebase.gov/catalog/item/5f6f701c82ce38aaa24c17b8 and https://umesc.usgs.gov/management/dss/umrs_land_cover_viewer.html						

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Systemic analysis of hydrogeomorphic influences on native freshwater mussels						
2019FM5	Calculate pool-wide population estimates of native mussels in Pools 8 and 13, finish assessing patterns in mussel assemblages across a gradient of geomorphic indices (all pools), begin conducting statistical analyses	30-Sep-2020	30-Sep-2021		Delayed since lead technician who was to perform most of the analyses took a new position; new hire in place	Teresa Newton
2019FM6	Annual progress summary	30-Dec-2020	30-Dec-2021			Teresa Newton
2019FM7	Complete statistical analyses and prepare geospatial maps	30-Sep-2021	30-Sep-2022			Teresa Newton, Catherine Murphy, Jason Rohweder
2019FM8	Draft LTRM completion report	30-Sep-2021	30-Sep-2022			Teresa Newton
2019FM9	Final LTRM completion report	30-Jan-2023				Teresa Newton
Using dendrochronology to understand historical forest growth, stand development, and gap dynamics						
2019DD6	Baseline dataset for promoting resilience of hard mast forest communities along the UMRS	30-Jun-2020	30-Aug-2021	Delay in field work data collection has significantly altered the anticipated time for analysis.		Dr. Harley, Dr. Maxwell, MS students
2019DD7	Submit draft manuscript	30-Sep-2020	30-Sep-2021			Dr. Harley, Dr. Maxwell, MS students
Forest canopy gap dynamics: quantifying forest gaps and understanding gap – level forest regeneration						
Manuscript: Forest canopy gap dynamics: quantifying forest gaps and understanding gap - level forest regeneration in Upper Mississippi River floodplain forests (in USGS Review, 2019FG5,						
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				Quinton Phelps
2019VR9	Submit draft manuscript (Vital rates)	31-Dec-2021				Quinton Phelps, Kristen Bouska
2019VR10	Submit draft manuscript (Drivers of vital rates)	31-Dec-2021				Quinton Phelps, Kristen Bouska
2019VR11	Submit draft manuscript (Microchemistry)	31-Dec-2021				Greg Whitledge
FY19 Funded Science in Support of Restoration and Management						
Development of a standardized monitoring program for vegetation and fish response to Environmental Pool Management practices in the Upper Mississippi River System						
2019epm2	Progress Summary	30-Dec-2020		30-Mar-2021		Chick and McGuire
2019epm3	Draft LTRM Completion	30-Jun-2021			Field work delayed due to Covid-19 protocols and high water	Chick and McGuire
2019epm4	Final LTRM Completion	30-Dec-2021				Chick and McGuire
Combining genetics, otolith microchemistry, and vital rate estimation to inform restoration and management of fish populations in the UMRS						
2019gen3	Draft Manuscript	30-Dec-2021				Larson, Bartels, Bouska
Reforesting UMRS forest canopy openings occupied by invasive species						
2019ref2	Progress Summary	30-Dec-2020		11-Feb-2021	Project delays due to high water in 2019	Guyon and Cosgriff
2019ref3	Draft LTRM Completion	30-Apr-2021				Guyon and Cosgriff
2019ref4	Final LTRM Completion	30-Sep-2021				Guyon and Cosgriff

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						
2019zoo1	Progress Summary	30-Dec-2019		2-Jan-2020		Sobotka and Fulgoni
2019zoo2	Draft LTRM Completion report on utility of zooplankton community monitoring for HREP assessment	30-Dec-2020	30-Jun-2021		Sample collection delayed because of Covid-19 state protocols	Sobotka and Fulgoni
2019zoo3	Final LTRM Completion report on utility of zooplankton community monitoring for HREP assessment	30-Jun-2021	30-Dec-2021			Sobotka and Fulgoni
2019zoo4	Draft LTRM Completion report on on detailing differences between pools and habitats. Report will also investigate the potential investigate the potential impacts of Asian carp on the zooplankton community.	30-Dec-2020	30-Jun-2021		Sample collection delayed because of Covid-19 state protocols	Sobotka and Fulgoni
2019zoo5	Final LTRM Completion report on on detailing differences between pools and habitats. Report will also investigate the potential investigate the potential impacts of Asian carp on the zooplankton community.	30-Jun-2021	30-Dec-2021			Sobotka and Fulgoni
The Role of Large Wood in The Restoration of Habitat in the Upper Mississippi River System						
2019LW1	Progress Summary	31-Dec-2019	14-Feb-2020	12-Feb-2020		Thomsen, Jankowski
Graduate student successfully defended thesis in January 2021. He continues to work on a manuscript version for publication. 2019LW3						
FY19 Funded Illinois Waterway 2020 Lock Closure						
Aquatic Vegetation: Navigation Closure Study						
2020SAV1	Field sampling - during lock closure	30-Aug-2021				Lund, Drake, Bales, others
2020SAV2	Progress Summary	30-Dec-2021				Lund, Drake, Bales
Pre- and Post-Maintenance Aerial Imagery for Illinois River's Alton through Brandon Lock and Dams, 2019-2021.						
XXXX	Acquire 4-band aerial imagery 2020	30-Aug-21				Lubinski, Robinson, Finley, and Hop
Fish Community Response to the 2020 Illinois Waterway Lock Closure						
2020FSH1	Field sampling - during lock closure	30-Oct-2021				Lamer and Solomon
2020FSH2	Progress Summary	30-Dec-2021				Lamer and Solomon
Water Clarity and the IWW Lock Closures						
2021WC1	Analysis of data collected on barge -driven wave action, sediment suspension, and phytoplankton biomass	30-Dec-2021				Jankowski (collaborating with Fish and SAV studies)

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						
2021HG1	Complete annual project summary	31-Dec-2020		31-Dec-2020		Strange, Fitzpatrick
2021HG2	Conduct web meeting with core team and panelists, introduce new geomorphologist	30-Jan-2021		30-Jan-2021		Geomorphologist, Strange, Fitzpatrick, all attend
2021HG3	GIS compilation of hydrogeomorphic units and catena	30-Mar-2021		30-Mar-2021		Strange, Fitzpatrick, Geomorphologist, Van Appledorn
2021HG4	Conduct web meeting for presentation of results from hydrogeomorphic change classification interpretation, checking, testing, and application	30-Nov-2021				Geomorphologist, Strange, Fitzpatrick, all attend
2021HG5	Complete annual project summary	31-Dec-2021				Strange, Fitzpatrick
2021HG6	Submit draft LTRM Completion report on hydrogeomorphic change GIS database and query system	31-Dec-2021				Geomorphologist, Strange, Fitzpatrick, Van Appledorn, USACE core team
2021HG7	Submit Final LTRM Completion report on hydrogeomorphic change GIS database and query tool.	30-Mar-2022				Geomorphologist, 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				M. Van Appledorn, L. Sawyer
2021HH2	Draft LTRM Completion Report: document database and documentation development steps, database capabilities, and quantitative summaries of the hydrologic regime through time.	30-Dec-2021				M. Van Appledorn, L. Sawyer
2021HH3	Final LTRM Completion Report: document database and documentation development steps, database capabilities, and quantitative summaries of the hydrologic regime through time	31-Mar-2022				M. Van Appledorn, L. Sawyer
2021HH4	Developing Future Hydrologic Scenarios Workshop: topics include identify appropriate future climate and/or land-use scenarios for use in a UMRS watershed model, existing hydrologic modeling resources and capabilities, and logistics for completing a climate-changed hydrologic modeling effort	30-Dec-2021				M. Van Appledorn, L. Sawyer
2021HH5	Draft LTRM Completion Report (Scenarios): This report will serve as the blueprint for modeling future hydrology to be undertaken with future funding opportunities.	31-Mar-2022				M. Van Appledorn, L. Sawyer, R. Seal-Soileau

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2021HH6	Final LTRM Completion Report (Scenarios): This report will serve as the blueprint for modeling future hydrology to be undertaken with future funding opportunities.	30-Jun-2022				M. Van Appledorn, L. Sawyer, R. Seal-Soileau
Understanding physical and ecological differences among side channels of the Upper Mississippi River System						
2021SC1	Annual progress summary: data collection and processing, preliminary analyses, and initial methods evaluation	30-Dec-2020		30-Dec-2020		Sobotka, Strange, Bouska, McCain, Theel, Vander Vorste
2021SC2	Annual progress summary on side channel classification scheme, recommendations for additional sampling, analyses of side channel classes and ecological associations	30-Dec-2021				Sobotka, Strange, Bouska, McCain, Theel, Vander Vorste
2021SC3	Manuscript on side channel classification scheme submitted for peer review	30-Sep-2022				Sobotka, Strange, Bouska, McCain, Theel
2021SC4	Final report on UMRR management implications submitted for USGS review	30-Sep-2022				Sobotka & McCain
2021SC5	Manuscript on benthic invertebrate associations with side channel characteristics submitted for USGS and peer review	30-May-2023				Sobotka & Vander Vorste
Refining our Upper Mississippi River's ecosystem states framework						
2021SS1	Data integration (gather datasets, integrate)	1-Dec-2020		1-Dec-2020		Rohweder (All assist)
2021SS2	Identify states and transitions using NMDS approach	1-Mar-2021		1-Mar-2021		Larson, Carhart
2021SS3	Driver-response curves	1-May-2021		1-May-2021		Larson
2021SS4	Workshop: vulnerability assessment	1-May-2021			Delayed to FY22 due to Covid-19 protocols	Larson, Delaney
2021SS5	Annual reporting and data management update	1-Sep-2021				Larson
2021SS6	Vulnerability maps	1-Dec-2021				Delaney
2021SS7	Spatial mapping of states and changes	1-Dec-2021				Rohweder (Carhart trains)
2021SS8	TDA Mapper, regime shifts	1-May-2022				Bungula, student, Larson
2021SS9	Draft the STM, share with stakeholders	1-Sep-2022				Larson
2021SS10	Technical report, vulnerability assessment tool, and manuscripts to IDPS for internal review	1-Sep-2022				All

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Augmenting the UMRR fish vital rates project with greater species representation for genetics and otolith microchemistry						
2021VR1	Annual progress summary	31-Dec-2020		31-Dec-2020		Bartels, Bouska, Davis, Lamer, Tan, Whitledge
2021VR2	Annual progress summary	31-Dec-2021				Bartels, Bouska, Davis, Lamer, Tan, Whitledge
2021VR3	Submit draft manuscript (genetics)	31-Dec-2022				Davis, Tan, Lamer
2021VR4	Submit draft manuscript (genetics - mimic/channel)	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 rehabilitation						
2021FF1	Draft manuscript: Evidence of alternative trophic pathways for fish consumers in a large river system	30-Sep-2021				Ickes and Gatto
2021FF2	Draft manuscript: “Has large scale ecosystem rehabilitation altered functional fish community expressions in the Upper Mississippi River System?”	30-Sep-2021				Ickes and Gatto
2021FF3	Draft Manuscript: “Why aren’t bigheaded carps (*Hypophthalmichthys* sp.) everywhere in the Upper Mississippi River System?”	30-Sep-2021				Ickes and Gatto
Understanding landscape-scale patterns in winter conditions in the Upper Mississippi River System						
2021WL1	System wide spatial layers of habitat conditions	30-Sep-2022				Mooney, Dugan, Magee
2021WL2	Draft manuscript: Landscape scale controls on overwintering habitat in a large river	30-Sep-2022				Mooney , Dugan, Jankowski, Magee
2021WL3	Draft manuscript: Response of oxygen dynamics to 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						
2021FR1	Annual Summary	31-Dec-2020	Field work set to be initiated 2021 summer. Developing methods			Cosgriff, Guyon, De Jager
2021FR2	Annual Summary Reports & Tables	31-Dec-2021				Cosgriff, Guyon, De Jager
2021FR3	Technical Report	1-Jun-2022				Cosgriff, Guyon, De Jager

UMRR Science in Support of Restoration and Management
FY2014 and FY2015 Scopes of Work
August 2021 Status

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Plankton community dynamics in Lake Pepin						
2015LPP1	Phytoplankton processing; species composition, biovolume	30-Dec-15		22-Oct-15		Burdis
2015LPP2	draft manuscript: Plankton community dynamics in Lake Pepin	30-Sep-16	30-Jun-21		New analysis complete, writing ongoing	Burdis
Predictive Aquative Cover Type Model - Phase 2						
2015AQ1	Develop 2-D hydraulic model of upper Pool 4	30-Sep-15		30-Sep-15		Libbey (MVP H&H)
2015AQ2	Apply model to Pool 4 and resolve discrepancies	31-Dec-15	31-Mar-16	31-Mar-16		Yin, Rogala
2015AQ3	Detailed summary of work for Phases I & II	31-Dec-15		NA	Work terminated with resignation of Dr. Yin. Danelle Larson will re-evaluate vegetation modeling in a future time frame	Sauer (for Yin), Rogala, Ingvalson

UMRR LTRM Implementation Planning Update

The UMRR LTRM Implementation Planning Team (Marshall Plumley, Karen Hagerty, Mark Gaikowski, Jeff Houser, Jennifer Sauer. Nick Schlesser, Jim Fischer, Matt Vitello, Kirsten Wallace, and Andrew Stephenson) met on 15 July 2021 to discuss the selection of facilitator(s) for the upcoming meetings and review the Implementation Planning Guidance Document.

Previously, UMRR Partners were asked to solicit potential facilitators and provide biographies/introductions from potential facilitators to the planning group for consideration by the LTRM Implementation Planning Team. We received documents for 4 potential facilitators. After an initial review of the facilitators, the LTRM Management Team recommended Drs. Dave Smith and Max Post van der Burg (see documents following) to the full implementation planning team. Subsequent discussion with the implementation planning team achieved a consensus regarding these facilitators. These two individuals are being recommended because they have experience leading groups through a structured and, in some cases, quantitative approach to reach complex decisions with diverse groups. The Planning team is open to discussion on the potential integration of Brian Stenquist (who has strategic planning history with UMRR) and Hunter Merritt (who has experience with coordinating and facilitating forestry comprehensive plans.) Integration of Mr. Stenquist and Merritt into the process depends on budget and needs as will be discussed with Drs. van der Burg and Smith.

The Guidance Document for this implementation planning is considered a living document (See document following) which contains the background, purpose, initial thoughts on the process, and desired outcomes of Implementation Planning. We are asking the UMRR Coordinating Committee Members to review the Guidance Document and send comments/edits to Jeff Houser (jhouser@usgs.gov).

Max Post van der Burg, Ph.D. Biography/Philosophy: I work for the USGS as a quantitative ecologist and decision analyst. I have over 14 years of experience with leading folks through decision making processes and teaching decision analysis to practitioners. To be clear, I am not a meeting facilitator. I follow a process and I act as more of a coach leading the group through that process. Generally, I coach groups to articulate what decision they think they would like to make, what outcomes they would like to see from making the decision and what options are available to affect those outcomes. Then I typically lead the group through a qualitative or quantitative assessment of the options. This is where we analyze trade-offs between competing outcomes and perhaps even search for better solutions to those trade-offs. Ultimately, the assessment is intended to provide insight to those who have the authority to make the choices. I have coached groups through some pretty diverse problems: deciding which information is most important to collect, how best to adapt to climate change, or how to manage invasive species under uncertainty, just to name a few.

I want to recognize that some people are skeptical of the idea of a formal decision process. My opinion is that some of this skepticism may arise from bad experiences with formal group decision making processes. While I tend to be very flexible in terms of where we start in the process and what jargon we may choose to use, there are a few things that I have noticed put groups in a position for success. First, and perhaps most important, is a commitment to the idea that there is a choice to be made. If there really isn't a choice to be made, but rather folks just need to have a discussion, any structured decision process will not work out. You would be better off just having your discussion. Probably the second most important thing is a commitment to the idea that a process is there to help with collaboration and co-development of a strategy for moving forward. Folks often get disappointed when a course forward gives them some, but not all of what they want. Furthermore, when people operate with hidden outcomes in mind, they tend to short-circuit the process, which leaves people feeling bad about the process. This is just another way of saying that honesty and a willingness to collaboratively problem-solve is key to the success of any process. Lastly, I would say that having an honest and flexible broker is extremely important. That would be my job as a coach. I have found that when coaches adhere too strongly to a rote process or have a vested interest in the outcome, things tend to not go well. I view coaches more like guides through a process, where their interest is more in getting a group through the process to a point where everyone feels content about the outcome. When everyone participates in the process, people are more invested in the solution and that solution tends to be more durable in the long term.

Dave Smith
Decision Analysis Summary

In my position as a U.S. Geological Survey (USGS) principal investigator, I have built a research program in the areas of applied ecology and decision analysis. Within those areas, I have developed and tested methods to sample and monitor populations to inform management decisions, developed and evaluated management strategies to optimize conservation efforts using adaptive management and structured decision making, and helped to build capacity within U.S. Department of the Interior in structured decision making and decision analysis through a training program at the National Conservation Training Center (NCTC). I served as instructor in several of NCTC's team-taught courses (https://training.fws.gov/courses/programs/decision-analysis/):

- An Overview of Structure Decision Making
- Introduction to Structured Decision Making
- Decision Analysis: Elicitation and Facilitation
- Decision Analysis: Tools
- Collaboration and Conflict Transformation in Multi-Party Processes
- Structured Decision-Making Workshop: Observers and Mentees

An emerging theme of my research assignment over the past 14 years has been to connect management and science using decision analysis. Examples include:

- I have facilitated and coached groups through structured decision-making process at workshops organized by NCTC. In the workshops, teams of decision makers, stakeholders, and scientists worked on solving natural resource management problems. Recently co-edited book with authored chapters, compiles case study reports resulting from these SDM workshops.
    - https://www.amazon.com/Structured-Decision-Making-Management-Conservation/dp/1421437562
- Examples of co-leading stakeholder groups on 1) development of decision-support tools to guide the optimal rapid response following environmental DNA (eDNA) detections of aquatic invasive species that account for detection errors with Katie O'Donnell (USGS WARC) and Adam Sepulveda (USGS NOROCK) 2) risk management of Asian carp invasion through barrier placement and targeted removal in the Tennessee River basin with Max Post van der Burg (USGS NPWRC), 3) a request from the U.S. Office of Surface Mining and FWS for assistance on promulgating regulatory guidelines; 4) a request from the Bureau of Reclamation for assistance with managing Glen Canyon dam under an EIS (in this case the request came to Mike Runge who was the lead on this project); 5) requests from the FWS for decision analysis help with endangered species determinations regarding imperiled aquatic species in Upper Tennessee River Basin, dwarf wedgemussel strategic conservation, sage grouse listing and red wolf reclassification [On sage grouse project, I worked with Sarah Converse (USGS), Steve Morey (FWS), and Jonathan Cummings (a USGS post-doc); and, on the red wolf project, I assisted Krishna Pacifici (NCSU) who led that project]; 4) a request from Rutgers University and NJ Sea Grant for structured decision making advice regarding management of shellfish aquaculture on the Delaware Bay intertidal zone to account for interactions with horseshoe crabs and threatened red knot [I worked with Jim Lyons (USGS) who led this effort]. In all the above project-specific case studies, groups requested help from a decision analyst after prior processes broke down or in anticipation of difficult decisions due to unresolved conflict or high scientific uncertainty. In those situations, I strove to help groups clarify the central issues and to resolve those issues where possible, but I reached various degrees of success. Some groups were able to

identify previously obscured sources of conflict, which is prerequisite to resolving the conflict, identify key sources of uncertainty for further research, or clarify promising decision options. However, in other cases, decision analysis did not solve the problem entirely because conflict was too great for the group to proceed with collaborative decision making or the decision makers were uncomfortable with the degree of transparency that is integral to a structured decision process. In such cases, other processes (such as, conflict resolution, joint-fact finding, or interest-based negotiation) can sometimes be helpful.

- Examples of applying multiple criteria decision analysis to address tradeoffs in conservation decisions.
    - Developing a landscape-scale, multi-species, and cost-efficient conservation strategy for imperiled aquatic species in the Upper Tennessee River Basin, USA. (https://onlinelibrary.wiley.com/doi/abs/10.1002/aqc.2785)
    - Using decision analysis to guide restoration of Herring River Estuary in the Cape Cod National Seashore. (https://pubs.er.usgs.gov/publication/ofr20191115)
- Examples of tailoring decision analyses to opportunities regarding tradeoffs among energy/economic and environmental objectives.
    - Optimization of Decision Rules for Hydroelectric Operation to Reduce Both Eel Mortality and Unnecessary Turbine Shutdown: A Search for a Win-Win Solution. (https://onlinelibrary.wiley.com/doi/abs/10.1002/rra.3182)
    - Shale Gas Development and Brook Trout: Scaling Best Management Practices to Anticipate Cumulative Effects. (https://www.tandfonline.com/doi/abs/10.1017/S1466046612000397)
- Adaptive management of Delaware Bay horseshoe crabs and migrating shorebirds is an example of a long-term project to develop a framework for recurrent decisions on conserving multiple species within a major estuary. I was involved in the inception of this multiple stakeholder decision process, have served in various committee chair and member roles, and remain involved in current deliberations.

UMRR LTRM Implementation Planning 2021
Draft Guidance Document

Background:
The Water Resources Development Act of 2020 (WRDA 2020) included an increase in authorization for both elements of the Upper Mississippi River Restoration (UMRR) program. Authorization for the LTRM element increased from $10.42M to $15M. Additional funds, if appropriated, would present an opportunity to expand our understanding of the UMRS and better inform restoration and management. To prepare for the potential appropriation of additional funds, an Implementation Plan will be created for LTRM to identify and prioritize specific information needs and specific actions that address those needs. The following outline provides initial guidance for an approach for developing the Implementation Plan.

Purpose:
To create an implementation plan that identifies and prioritizes specific information needs not presently being met and specific actions to take to address those needs if additional funds are appropriated for UMRR LTRM.

Planning Process:
The planning process should:

A. Be structured to create the time and space needed to think deeply about challenging questions at a level of detail that identifies agreed-upon actions.

B. Allow decisions to be made through a fair and participatory process so that all partners see that:
    a. Their perspective influenced the decisions.
    b. All the recommended actions and their prioritization are well-justified.

C. Allow/encourage participants to step away from their usual talking points and:
    a. Identify <u>what</u> information their agencies need to improve their management and restoration of the UMRS, and
    b. Describe <u>how</u> that information will be used.

D. Work within existing planning frameworks (e.g., 2015-2025 UMRR Strategic and Operational Plan) that describe the high-level mission, objectives, and strategies for the program.
    c. The “Strategies” and “Actions” columns in the Goal 2 table of the 2015 – 2025 are particularly relevant.

E. Use facilitators with skills and experience in a formal method to guide representatives from partner agencies through a structured process to determine an agreed upon list of prioritized information needs and specific actions to address each those needs.

F. Answer the following questions
    a. What impacts do we want to have with additional work?
    b. What do we need to know that we aren’t currently addressing?
    c. What actions do we need to take to address that information need?
    d. Or, put another way:
        i. What do we need to know?
        ii. Why do we need to know it?
        iii. How will that knowledge be used?
        iv. What are the risks incurred as a result of lacking this knowledge?

(date of this version: 2021.07.23)

UMRR LTRM Implementation Planning 2021
Draft Guidance Document

Desired Outcomes:

A. Specific information needs not currently being met are identified and prioritized.

B. Specific actions that need to be taken to meet those information needs are identified and prioritized.

Other points to consider during the planning process:

A. Data do not equal actionable information
   a. Actionable information results from data collection, public access to the data, data analysis, and the communication of those results (presentations, papers, reports)
   b. All four (data collection, public access to the data, data analysis, and communication of results) need to be planned for and supported

B. The agreed-upon priority information needs produced through this process will be useful within this process and beyond -- for example, by informing future science meeting focal areas.

C. There is a diversity of actions that could be taken to address priority information needs. Examples include, but are not limited to:
   a. Additional analysis of existing data (bring in additional expertise)
   b. Expand existing components to new places (with proportional increase in expertise and capacity to ensure the new data is effectively converted to answers to priority questions)
   c. New components in existing places (ditto)
   d. Self-contained multi-year studies to address specific information needs

D. Discussion of which actions to take should follow the identification of priority information needs, not precede, or mix in with that discussion.

E. Would it be beneficial to have a participant with technical expertise in river ecology from outside the UMRR program as a member of the planning team? Or as a participant in one or more of the larger meetings/workshops?

F. Retain capability to use this information from implementation planning and flex the program as funding levels allow

G. Importance of a “parking lot” for ideas that should be kept in mind for later

(date of this version: 2021.07.23)

ATTACHMENT E

Additional Items

- **Future Meeting Schedule** *(E-1)*
- **Frequently Used Acronyms (12/21/2017)** *(E-2 to E-7)*
- **UMRR Authorization, As Amended (1/11/2021)** *(E-8 to E-11)*
- **UMRR (EMP) Operating Approach (5/2006)** *(E-12)*

QUARTERLY MEETINGS
FUTURE MEETING SCHEDULE

NOVEMBER 2021	
Location to be determined	
November 16	UMRBA Quarterly Meeting
November 17	UMRR Coordinating Committee Quarterly Meeting

FEBRUARY 2022	
Location to be determined	
February 22	UMRBA Quarterly Meeting
February 23	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
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
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
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
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
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
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
HAB	Harmful Algal Bloom
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
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
IIA	Implementation Issues Assessment
IIFO	Illinois-Iowa Field Office (formerly RIFO - Rock Island Field Office)
ILP	Integrated License Process
IMTS	Inland Marine Transportation System
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
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
MICRA	Mississippi Interstate Cooperative Resource Association
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
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	Preliminary 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
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
SONS	Spill of National Significance
SOW	Scope of Work
SRF	State Revolving Fund
SWCD	Soil and Water Conservation District
T&E	Threatened and Endangered
TEUs	twenty-foot equivalent units
TIGER	Transportation Investment Generating Economic Recovery
TLP	Traditional License Process
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TSP	Tentatively selected plan
TSS	Total Suspended Solids
TVA	Tennessee Valley Authority
TWG	Technical Work Group
UMESC	Upper Midwest Environmental Sciences Center
UMIMRA	Upper Mississippi, Illinois, and Missouri Rivers Association
UMR	Upper Mississippi River
UMRBA	Upper Mississippi River Basin Association
UMRBC	Upper Mississippi River Basin Commission
UMRCC	Upper Mississippi River Conservation Committee
UMRCP	Upper Mississippi River Comprehensive Plan
UMR-IWW	Upper Mississippi River-Illinois Waterway
UMRNWFR	Upper Mississippi River National Wildlife and Fish Refuge
UMRR	Upper Mississippi River Restoration Program [Note: Formerly known as Environmental Management Program.]
UMRR CC	Upper Mississippi River Restoration Program Coordinating Committee
UMRS	Upper Mississippi River System
UMWA	Upper Mississippi Waterway Association
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VTC	Video Teleconference
WCI	Waterways Council, Inc.
WES	Waterways Experiment Station (replaced by ERDC)
WHAG	Wildlife Habitat Appraisal Guide
WHIP	Wildlife Habitat Incentives Program
WIIN	Water Infrastructure Improvements for the Nation Act
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

Upper Mississippi River Restoration Program Authorization

Section 1103 of the Water Resources Development Act of 1986 (P.L. 99-662) as amended by
Section 405 of the Water Resources Development Act of 1990 (P.L. 101-640),
Section 107 of the Water Resources Development Act of 1992 (P.L. 102-580),
Section 509 of the Water Resources Development Act of 1999 (P.L. 106-53),
Section 2 of the Water Resources Development Technical Corrections of 1999 (P.L. 106-109),
Section 3177 of the Water Resources Development Act of 2007 (P.L. 110-114), and
Section 307 of the Water Resources Development Act of 2020 (P.L. 116-260).

Additional Cost Sharing Provisions

Section 906(e) of the Water Resources Development Act of 1986 (P.L. 99-662) as amended by
Section 221 of the Water Resources Development Act of 1999 (P.L. 106-53).

SEC. 1103. UPPER MISSISSIPPI RIVER PLAN.

(a)(1) This section may be cited as the "Upper Mississippi River Management Act of 1986".

(2) To ensure the coordinated development and enhancement of the Upper Mississippi River system, it is hereby declared to be the intent of Congress to recognize that system as a nationally significant ecosystem and a nationally significant commercial navigation system. Congress further recognizes that the system provides a diversity of opportunities and experiences. The system shall be administered and regulated in recognition of its several purposes.

(b) For purposes of this section --

(1) the terms "Upper Mississippi River system" and "system" mean those river reaches having commercial navigation channels on the Mississippi River main stem north of Cairo, Illinois; the Minnesota River, Minnesota; Black River, Wisconsin; Saint Croix River, Minnesota and Wisconsin; Illinois River and Waterway, Illinois; and Kaskaskia River, Illinois;

(2) the term "Master Plan" means the comprehensive master plan for the management of the Upper Mississippi River system, dated January 1, 1982, prepared by the Upper Mississippi River Basin Commission and submitted to Congress pursuant to Public Law 95-502;

(3) the term "GREAT I, GREAT II, and GRRM studies" means the studies entitled "GREAT Environmental Action Team--GREAT I--A Study of the Upper Mississippi River", dated September 1980, "GREAT River Environmental Action Team--GREAT II--A Study of the Upper Mississippi River", dated December 1980, and "GREAT River Resource Management Study", dated September 1982; and

(4) the term "Upper Mississippi River Basin Association" means an association of the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, formed for the purposes of cooperative effort and united assistance in the comprehensive planning for the use, protection, growth, and development of the Upper Mississippi River System.

(c)(1) Congress hereby approves the Master Plan as a guide for future water policy on the Upper Mississippi River system. Such approval shall not constitute authorization of any recommendation contained in the Master Plan.

(2) Section 101 of Public Law 95-502 is amended by striking out the last two sentences of subsection (b), striking out subsection (i), striking out the final sentence of subsection (j), and redesignating subsection "(j)" as subsection "(i)".

(d)(1) The consent of the Congress is hereby given to the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, or any two or more of such States, to enter into negotiations for agreements, not in conflict with any law of the United States, for cooperative effort and mutual assistance in the comprehensive planning for the use, protection, growth, and development of the Upper Mississippi River system, and to establish such agencies, joint or otherwise, or designate an existing multi-State entity, as they may deem desirable for making effective such

agreements. To the extent required by Article I, section 10 of the Constitution, such agreements shall become final only after ratification by an Act of Congress.

(2) The Secretary is authorized to enter into cooperative agreements with the Upper Mississippi River Basin Association or any other agency established under paragraph (1) of this subsection to promote and facilitate active State government participation in the river system management, development, and protection.

(3) For the purpose of ensuring the coordinated planning and implementation of programs authorized in subsections (e) and (h)(2) of this section, the Secretary shall enter into an interagency agreement with the Secretary of the Interior to provide for the direct participation of, and transfer of funds to, the Fish and Wildlife Service and any other agency or bureau of the Department of the Interior for the planning, design, implementation, and evaluation of such programs.

(4) The Upper Mississippi River Basin Association or any other agency established under paragraph (1) of this subsection is hereby designated by Congress as the caretaker of the master plan. Any changes to the master plan recommended by the Secretary shall be submitted to such association or agency for review. Such association or agency may make such comments with respect to such recommendations and offer other recommended changes to the master plan as such association or agency deems appropriate and shall transmit such comments and other recommended changes to the Secretary. The Secretary shall transmit such recommendations along with the comments and other recommended changes of such association or agency to the Congress for approval within 90 days of the receipt of such comments or recommended changes.

(e) Program Authority

(1) Authority

(A) In general. The Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, may undertake, as identified in the master plan

(i) a program for the planning, construction, and evaluation of measures for fish and wildlife habitat rehabilitation and enhancement; and

(ii) implementation of a long-term resource monitoring, computerized data inventory and analysis, and applied research program, including research on water quality issues affecting the Mississippi River (including elevated nutrient levels) and the development of remediation strategies.

(B) Advisory committee. In carrying out subparagraph (A)(i), the Secretary shall establish an independent technical advisory committee to review projects, monitoring plans, and habitat and natural resource needs assessments.

(2) REPORTS. — Not later than December 31, 2004, and not later than December 31 of every sixth year thereafter, the Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, shall submit to Congress a report that —

(A) contains an evaluation of the programs described in paragraph (1);

(B) describes the accomplishments of each of the programs;

(C) provides updates of a systemic habitat needs assessment; and

(D) identifies any needed adjustments in the authorization of the programs.

(3) For purposes of carrying out paragraph (1)(A)(i) of this subsection, there is authorized to be appropriated to the Secretary $40,000,000 for fiscal year 1999 and each fiscal year thereafter.

(4) For purposes of carrying out paragraph (1)(A)(ii) of this subsection, there is authorized to be appropriated to the Secretary $15,000,000 for fiscal year 1999 and each fiscal year thereafter.

(5) Authorization of appropriations.—There is authorized to be appropriated to carry out paragraph (1)(B) $350,000 for each of fiscal years 1999 through 2009.

(6) Transfer of amounts.—For fiscal year 1999 and each fiscal year thereafter, the Secretary, in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, may transfer not to exceed 20 percent of the amounts appropriated to carry out clause (i) or (ii) of paragraph (1)(A) to the amounts appropriated to carry out the other of those clauses.

(7)(A) Notwithstanding the provisions of subsection (a)(2) of this section, the costs of each project carried out pursuant to paragraph (1)(A)(i) of this subsection shall be allocated between the Secretary and the appropriate non-Federal sponsor in accordance with the provisions of section 906(e) of this Act; except that the costs of operation and maintenance of projects located on Federal lands or lands owned or operated by a State or local government shall be borne by the Federal, State, or local agency that is responsible for management activities for fish and wildlife on such lands and, in the case of any project requiring non-Federal cost sharing, the non-Federal share of the cost of the project shall be 35 percent.

(B) Notwithstanding the provisions of subsection (a)(2) of this section, the cost of implementing the activities authorized by paragraph (1)(A)(ii) of this subsection shall be allocated in accordance with the provisions of section 906 of this Act, as if such activity was required to mitigate losses to fish and wildlife.

(8) None of the funds appropriated pursuant to any authorization contained in this subsection shall be considered to be chargeable to navigation.

(f) (1) The Secretary, in consultation with any agency established under subsection (d)(1) of this section, is authorized to implement a program of recreational projects for the system substantially in accordance with the recommendations of the GREAT I, GREAT II, and GRRM studies and the master plan reports. In addition, the Secretary, in consultation with any such agency, shall, at Federal expense, conduct an assessment of the economic benefits generated by recreational activities in the system. The cost of each such project shall be allocated between the Secretary and the appropriate non-Federal sponsor in accordance with title I of this Act.

(2) For purposes of carrying out the program of recreational projects authorized in paragraph (1) of this subsection, there is authorized to be appropriated to the Secretary not to exceed $500,000 per fiscal year for each of the first 15 fiscal years beginning after the effective date of this section.

(g) The Secretary shall, in his budget request, identify those measures developed by the Secretary, in consultation with the Secretary of Transportation and any agency established under subsection (d)(1) of this section, to be undertaken to increase the capacity of specific locks throughout the system by employing nonstructural measures and making minor structural improvements.

(h)(1) The Secretary, in consultation with any agency established under subsection (d)(1) of this section, shall monitor traffic movements on the system for the purpose of verifying lock capacity, updating traffic projections, and refining the economic evaluation so as to verify the need for future capacity expansion of the system.

(2) Determination.

(A) In general. The Secretary in consultation with the Secretary of the Interior and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, shall determine the need for river rehabilitation and environmental enhancement and protection based on the condition of the environment, project developments, and projected environmental impacts from implementing any proposals resulting from recommendations made under subsection (g) and paragraph (1) of this subsection.

(B) Requirements. The Secretary shall

(i) complete the ongoing habitat needs assessment conducted under this paragraph not later than September 30, 2000; and

(ii) include in each report under subsection (e)(2) the most recent habitat needs assessment conducted under this paragraph.

(3) There is authorized to be appropriated to the Secretary such sums as may be necessary to carry out this subsection.

(i) (1) The Secretary shall, as he determines feasible, dispose of dredged material from the system pursuant to the recommendations of the GREAT I, GREAT II, and GRRM studies.

(2) The Secretary shall establish and request appropriate Federal funding for a program to facilitate productive uses of dredged material. The Secretary shall work with the States which have, within their boundaries, any part of the system to identify potential users of dredged material.

(j) The Secretary is authorized to provide for the engineering, design, and construction of a second lock at locks and dam 26, Mississippi River, Alton, Illinois and Missouri, at a total cost of $220,000,000, with a first Federal cost of $220,000,000. Such second lock shall be constructed at or in the vicinity of the location of the replacement lock authorized by section 102 of Public Law 95-502. Section 102 of this Act shall apply to the project authorized by this subsection.

SEC. 906(e). COST SHARING.

(e) In those cases when the Secretary, as part of any report to Congress, recommends activities to enhance fish and wildlife resources, the first costs of such enhancement shall be a Federal cost when--

(1) such enhancement provides benefits that are determined to be national, including benefits to species that are identified by the National Marine Fisheries Service as of national economic importance, species that are subject to treaties or international convention to which the United States is a party, and anadromous fish;

(2) such enhancement is designed to benefit species that have been listed as threatened or endangered by the Secretary of the Interior under the terms of the Endangered Species Act, as amended (16 U.S.C. 1531, et seq.), or

(3) such activities are located on lands managed as a national wildlife refuge.

When benefits of enhancement do not qualify under the preceding sentence, 25 percent of such first costs of enhancement shall be provided by non-Federal interests under a schedule of reimbursement determined by the Secretary. Not more than 80 percent of the non-Federal share of such first costs may be satisfied through in-kind contributions, including facilities, supplies, and services that are necessary to carry out the enhancement project. The non-Federal share of operation, maintenance, and rehabilitation of activities to enhance fish and wildlife resources shall be 25 percent.

EMP OPERATING APPROACH

2006 marks the 20th anniversary of the Environmental Management Program (EMP). During that time, the Program pioneered many new ideas to help deliver efficient and effective natural resource programs to the Upper Mississippi River System (UMRS). These included the creation of an effective partnership of five states, five federal agencies, and numerous NGOs; a network of six field stations monitoring the natural resources of the UMRS; and the administrative structure to encourage river managers to use both new and proven environmental restoration techniques.

EMP has a history of identifying and dealing with both natural resource and administrative challenges. The next several years represent new opportunities and challenges as Congress considers authorization of the Navigation and Environmental Sustainability Program (NESP), possible integration or merger of EMP with NESP, and changing standards for program management and execution.

We will continue to learn from both the history of EMP and experience of other programs. Charting a course for EMP over the next several years is important to the continued success of the Program. EMP will focus on the key elements of partnership, regional administration and coordination, LTRMP, and HREPs.

The fundamental focus of EMP will not change, however the way we deliver our services must change and adapt. This will include:

- further refinements in regional coordination and management,
- refinement of program goals and objectives,
- increased public outreach efforts,
- development and use of tools such as the regional HREP database and HREP Handbook,
- exploring new delivery mechanisms for contracting,
- continued refinement of the interface between LTRMP and the HREP program components, and
- scientific and management application of LTRMP information and data.

The focus of these efforts must benefit the resources of the UMRS through efficient and effective management.