

**Upper Mississippi River Restoration Program
Coordinating Committee**

Quarterly Meeting

November 8, 2017

**Agenda
with
Background
and
Supporting Materials**

UPPER MISSISSIPPI RIVER RESTORATION PROGRAM COORDINATING COMMITTEE

November 7-8, 2017

AGENDA

Tuesday, November 7 Partner Quarterly Pre-Meetings

- 3:30 – 5:00 p.m. Corps of Engineers
3:30 – 5:00 p.m. Department of the Interior
3:30 – 5:00 p.m. States

Wednesday, November 8 UMRR Coordinating Committee Quarterly Meeting

| Time | Attachment | Topic | Presenter |
|------------|------------|---|---|
| 8:00 a.m. | | Welcome and Introductions | <i>Sabrina Chandler, USFWS</i> |
| 8:05 | A1-11 | Approval of Minutes of August 9, 2017 Meeting | |
| 8:10 | | Regional Management and Partnership Collaboration <ul style="list-style-type: none">▪ FY 2017 Fiscal Report▪ FY 2018 Fiscal Update▪ FY 2019 Funding Outlook▪ Current and Out-Year Implementation Planning▪ UMRR External Communications Strategy | <i>Marv Hubbell, USACE</i> |
| 8:45 | | UMRR Showcase Presentations <ul style="list-style-type: none">▪ HREP: TBD▪ Peterson Lake HREP – Adaptive Management Evaluation | <i>TBD</i> <i>Rob Burdis, MN DNR</i> |
| 9:15 | B1-8 | Habitat Needs Assessment | <i>TBD</i> |
| 10:00 | | Break | |
| 10:15 | | Program Reports <ul style="list-style-type: none">▪ Habitat Restoration<ul style="list-style-type: none">– District Reports– Next Generation of Projects– Partnership Meeting re Implementation Challenges▪ Long Term Resource Monitoring and Science<ul style="list-style-type: none">– LTRM Highlights– January 2018 UMRR Science Coordinating Meeting– USACE LTRM Update– A-Team Report | <i>District HREP Managers</i> <i>Marv Hubbell, USACE</i> <i>Jeff Houser, USGS</i> <i>Karen Hagerty, USACE</i> <i>Matt Vitello, MO DoC</i> |
| 11:50 | D1 | Other Business <ul style="list-style-type: none">▪ Future Meeting Schedule | |
| 12:00 noon | | Adjourn | |

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

ATTACHMENT A

Minutes of the August 9, 2017
UMRR Coordinating Committee Quarterly Meeting
(A-1 to A-11)

DRAFT
Minutes of the
Upper Mississippi River Restoration Program
Coordinating Committee

August 9, 2017
Quarterly Meeting

Upper Midwest Environmental Sciences Center
La Crosse, Wisconsin

Don Balch of the U.S. Army Corps of Engineers called the meeting to order at 8:05 a.m. on August 9, 2017. Other UMRR Coordinating Committee representatives present were Sabrina Chandler (USFWS), Jeff Houser (USGS) on behalf of Mark Gaikowski, Dan Stephenson (IL DNR), Randy Schultz (IA DNR), Megan Moore (MN DNR), Matt Vitello (MO DoC), Jim Fischer (WI DNR), and Ken Westlake (USEPA) via phone. A complete list of attendees follows these minutes.

MVD Reorganization

Don Balch announced that MVD recently reorganized staff internally. Brian Chewning will now serve as the Corps' UMRR Coordinating Committee representative. Balch said this will likely be his last Coordinating Committee meeting.

Minutes of the May 24, 2017 Meeting

Megan Moore offered two corrections to the draft minutes of the May 24, 2017 UMRR Coordinating Committee meeting: 1) Change \$331.7 million to \$33.17 million in the third line on the second full paragraph on page A-2. 2) Add Moore to the attendance list on page A-9.

Jim Fischer moved and Moore seconded a motion to approve the draft minutes of the August 9, 2016 UMRR Coordinating Committee meeting as provided in the agenda packet with Moore's requested changes. The motion carried unanimously.

Regional Management and Partnership Collaboration

FY 2017 Fiscal Report

Marv Hubbell recalled that Congress appropriated \$20 million of FY 2017 funding to UMRR.

Marv Hubbell reported that the Corps allocated \$13.17 million to UMRR in its FY 2017 work plan (in addition to Congress' \$20 million appropriation) bringing the program's total FY 2017 funding level to \$33.17 million. Internal allocations within the program were adjusted to reflect the additional funding as follows:

- Regional Administration and Programmatic Efforts — \$1,235,000
- Regional Science and Monitoring — \$9,385,000
 - Long term resource monitoring — \$4,610,000
 - Regional science in support of restoration — \$3,500,000
 - Regional science staff support — \$100,000
 - Habitat project evaluations — \$975,000
 - Habitat Needs Assessment II — \$200,000

- Habitat Restoration — \$22,549,000
 - Regional project sequencing — \$100,000
 - MVP — \$7,683,000
 - MVR — \$5,050,000
 - MVS — \$9,716,500

In response to a question from Jim Fischer, Hubbell said UMRR spends between \$50,000 and \$75,000 annually on public outreach and engagement activities, acknowledging that the Corps' focus on UMRR communications fluctuates. Hubbell explained that Col. Baumgartner recently readjusted the Rock Island District's communications priorities and stated that he does not want the District to favor any one particular program in its external messaging. Thus, Angie Freyermuth will no longer be able to dedicate substantial time to UMRR external communications and outreach. Recalling that the UMRR Coordinating Committee has continually requested more dedicated, focused attention to communications, Fischer requested that the Corps utilize its support services arrangement with UMRBA to implement UMRR's external communications strategies. In response, Hubbell said Col. Baumgartner does not want to outsource UMRR communications. In response to a question from Fischer, Hubbell said the Corps will continue to convene the *ad hoc* communications group.

FYs 2018 and 2019 Funding Outlook

Hubbell reported that the President's FY 2018 budget includes \$33.17 million for UMRR. The House and Senate Appropriations Committees matched that funding level in their respective FY 2018 energy and water appropriations measures. However, the final budget outcome remains unknown.

Hubbell said District staff are working with Corps Headquarters on UMRR's FY 2019 budget proposal. Due to continued funding levels at \$33.17 million in FY 2017-2018, Headquarters directed the District to plan for full federal funding in FY 2019. Corps staff are working with USFWS and the states to address planning needs so that UMRR can effectively and efficiently execute habitat restoration with the additional resources.

Hubbell discussed revisions to the six-year plan for habitat projects using the diagram below, noting that many project schedules were advanced given the increased funding in FYs 2017 and 2018.



Kirsten Mickelsen observed that there are several projects in the planning phase over the next two to three years but far less in subsequent years. Mickelsen asked if there would be any short- or long-term implications of that. Hubbell acknowledged the importance of having two to three projects in project phase in each District for mitigating risk. In response to a question from Marty Adkins, Hubbell said the O&M phase for the Corps focuses on development of the O&M manual for the project sponsor. A project is considered complete once its final O&M manual is provided to the sponsor.

Adkins asked about the status of the Corps and NRCS easement issue affecting habitat projects. Don Balch said leadership in both agencies are still in negotiations to reach a solution. Balch said the Corps' Northwest Division is taking the lead on drafting a MOA with NRCS and that indications of an achievable solution are promising. Sabrina Chandler clarified that the agreement would involve restoration projects in other program authorities across the country. A change in NRCS policy regarding title mergers is complicating the issue and is also affecting USFWS lands.

External Communications

Karen Hagerty reported that the *ad hoc* UMRR external communications team met via conference call on June 14 and August 2, 2017. Communications folders will be soon available to partners to readily distribute as opportunities arise. Hagerty asked partners to contact her to join UMRR's communications team. Hagerty said there are a number of upcoming events that will provide opportunities for UMRR outreach, including open houses at Cape Girardeau Field Station on August 8, 2017 and UMESC on September 9, 2017. The UMESC event will include a booth specifically for UMRR.

Randy Hines and Sabrina Chandler reflected on the July 11, 2017 Mississippi River Connections Collaborative's meeting in La Crosse. The Collaborative is a 10-state group to raise the Mississippi River's profile. Chandler applauded Hines on his talk to the group about possible ways for the Collaborative and UMRR to partner on outreach.

Adkins said NRCS staff are connecting Angie Freyermuth with the agency's public relations staff in each staff to amplify messages about the Upper Mississippi and its relationship with the watershed and NRCS's projects.

Megan Moore said the Discovery Channel is developing a six part series on all the great rivers of the world with the Mississippi River the focus of one part. Moore said she was one of several partners interviewed. Dan Stephenson said the Discovery Channel also interviewed Illinois DNR representatives regarding Asian carp.

Chandler said the Washington Post is developing an interactive piece on the Upper Mississippi River that will likely be published in fall 2017.

Jim Fischer said Wisconsin DNR provided a tour of the Mississippi River to Wisconsin Wetlands Association. The tour included Pool 8 Islands and a LTRM fish sampling demonstration. Fischer also mentioned that the Mississippi River Parkway Commission is scheduled to hold its annual meeting on September 19-21, 2017 in Marquette, Iowa.

Fischer expressed appreciation to Freyermuth for her effort related to UMRR's external collaboration. He advised that partners be allowed lead outreach activities for UMRR if the Corps is unable to do so. Hubbell said that Col. Baumgartner recognizes the importance of promoting UMRR but prefers that communications remains internal within the Corps.

Program Showcases

Harpers Slough

Tom Novak discussed the design of Harpers Slough and lessons learned from the project. Harpers Slough is about 3,500 acres in Pool 9 located on USFWS' McGregor District. The project goals are to:

- Maintain and/or enhance habitat in the project backwater area for migratory waterfowl birds
- Create habitat for migratory and resident waterfowl birds
- Enhance channel habitat for riverine fish and mussel species
- Create and maintain protected lacustrine habitat for backwater fish species

Harpers Slough project features include construction and protection of islands, rock mounds, groins, dredging, and restoration of emergent wetlands. The project's construction contract was awarded on September 2014 and costs nearly \$12 million. The St. Paul District completed a pre-final inspection on August 2, 2017 and anticipates project completion in spring 2018 with a dedication ceremony in May.

Novak explained the knowledge gained from Harpers Slough construction, including features to provide access to islands for critters and seeding techniques that also encourage natural volunteers like cottonwood trees. Nate De Jager asked if the Corps is considering methods to facilitate cottonwood generation. Sabrina Chandler explained that planting efforts focus on species that do not recruit naturally and rely on species like cottonwoods that can naturally establish on their own to do so. There is no effort to prevent cottonwoods from regenerating.

Fischer expressed support for including critter pathways in habitat projects. In response to a question from Fischer, Novak said he assumes that the critter pathways constructed in the L&D 3 embankment project are functioning as intended given that the Corps has not received any feedback.

Quantifying the Effects of River-Floodplain Connectivity

Bill Richardson overviewed current research at the Maquoketa confluence into the Mississippi River to quantify the effect of floodplain-river connectivity for the removal of sediment, nutrients, and carbon. The site is co-managed by USFWS, Iowa DNR, and NRCS. Richard outlined the research goals as follows:

1. Quantify linkages between flooding and floodplain retention of flood-deposited sediment, carbon, nitrogen, and phosphorus
2. Determine floodplain nitrogen removal rates (sediment denitrification) and hyporheic loss of nitrate associated with flooding
3. Scale-up nitrogen, phosphorus, carbon, and sediment retention measurements to entire delta-floodplain system and regionally with floodplain inundation models

Richardson explained that initial findings suggest that:

- Large quantities of sediment, carbon, nitrogen, and phosphorous are captured within a small reconnected section of tributary floodplain.
- Large quantities of nitrogen are permanently removed from floodplains through denitrification.
- Lack of river-floodplain connectivity hinders the process of sediment, carbon, and nutrient removal.
- Floodplain soils are primed to secure or release stored phosphorous depending on concentrations of phosphorous in floodwaters.

Andy Barnes offered that Green Island Levee may provide an opportunity for expanding the research. Marty Adkins mentioned that there are two similar tributary areas that could potentially be restored to provide these benefits, including one area south of Lake Odessa and one just south of the Maquoketa tributary. Chandler reported that USFWS is currently trying to acquire the properties that Adkins mentioned and would intentionally flood the areas. Adkins emphasized the importance of tributary restoration and Richardson's research findings to quantify the value.

Habitat Needs Assessment II

Hubbell reported that Kat McCain will now serve as the Corps' representative on the Habitat Needs Assessment II tri-chair leadership team, which also includes Sara Schmuecker and Nate De Jager. Hubbell said he and the tri-chairs developed the following anticipated schedule for the HNA II going forward:

1. September 5: Steering Committee webinar to review a draft Information Development Summary Report and determine a process for review by partner agencies and the river teams
2. September 29: Draft systemic data layers are made available to partners for review
3. October: Partner webinar to showcase available HNA data layers
4. November 7: Final systemic data layers are published
5. November 8: UMRR Coordinating Committee meeting includes an update on the HNA II development process
6. February 7: UMRR Coordinating Committee meeting includes an update on the HNA II development process
7. March 1-31: Steering Committee and river teams review the draft HNA II Report 3
8. May 2018: UMRR Coordinating Committee consider approval of HNA II Report as written for use in a public review
9. May-June: Public review of HNA II Report
10. August 2018: UMRR Coordinating Committee considers endorsement of final HNA II Report

Hubbell explained how he envisions the HNA II integrating with the UMRR's other related efforts including the development and use of ecological resilience indicators and selecting the next generation of habitat projects.

In response to a question from Kirsten Mickelsen, De Jager explained that the functional class working subgroups are subject matter experts that are being informally consulted to develop specific datasets. In response to a suggestion from Karen Hagerty, De Jager said the A-Team has not yet been consulted but expressed agreement that the A-Team should be involved going forward.

De Jager explained that the HNA II is currently transitioning from information collection to determining applications for management. De Jager, in partnership with Schmuecker, McCain, and other partners are currently developing a draft report that recommends the framework and a series of indicators. He discussed the HNA II's framework for relating the UMRS goals and objectives, Essential Ecosystem Characteristics (EECs) and quantitative measures (indicators) of ecosystem structure, function, and resilience. Pending additional input, De Jager said a draft document explaining this framework will be distributed to the HNA II Steering Committee soon. This includes developing visualization tools that synthesize multiple aspects of ecosystem structure, function, and resilience across the system at one time – e.g., spider diagrams. He acknowledged that additional efforts will be needed to identify targets for management and restoration.

In response to a question from Hagerty, De Jager said there will be a future scenario depicting no further investment in UMRR. Hagerty suggested that waterfowl habitat information is expanded, noting the potential to utilize available USFWS and state data.

Ken Lubinski expressed appreciation to De Jager for the use of David Harlow's recommendations in the HNA 2000 particularly for using the five EECs. In addition, Lubinski said Harlow emphasized the importance of involving the public when defining a desired future condition and ecological goals. In response to a question from Lubinski, De Jager said there has not been a public outreach component to the HNA II but he assumes river managers have a good perspective on public opinion. Lubinski advised the group to consult the public at some point, noting that "essential" ecological characteristics imply an associated value. Hubbell asked Lubinski to offer any suggestions for how to do that effectively, recognizing that the 2009 reach planning effort struggled with a public review process. Lubinski suggested that public relations experts be involved to help determine an approach and communicate complex terms and concepts in understandable ways.

In response to a question from Lubinski, De Jager explained that the HNA II has focused primarily on recurring ecological features throughout the system. A future next step will be to tease out unique features such as Lake Pepin. In response to a question from Megan Moore, De Jager explained that spatial scale will differ depending on the dataset characteristics.

Fischer thanked De Jager for his tremendous work in synthesizing a large amount of information into application tools that will ultimately lend high utility to river managers. Mickelsen echoed Fischer's sentiment and specifically recognized the value of the visualization tools for communicating the HNA II conclusions to external audiences. Mickelsen said she believes that these concepts will resonate with floodplain stakeholders interested in flood storage areas to reduce peak flows as well as recreationists interested in improving habitat areas for certain species. Reflecting on the earlier discussion regarding public outreach, Mickelsen requested that the Corps reevaluate its position to work through a contracting mechanism if the Corps is not able to implement the communications needs internally. Mickelsen recognized that a contracting mechanism could be structured in various ways, including developing and implementing communications strategies and products under the Corps' cover or a partnership cover. She recommended that the UMRR Coordinating Committee develop more detailed recommendations for implementing its communications goals. Fischer agreed, noting the value of being able to work with river partners and integrate habitat needs in the river's multiple-use management context. Hubbell questioned the ability to employ a public outreach campaign specific to the HNA II recognizing the short timeframe required for completing the final report. He asked if a 30-day comment period would be sufficient.

Adkins encouraged the UMRR partnership to explore innovative ways to connect with various audiences rather than the standard public comment process. For example, Adkins suggested developing informal materials to distribute at BassPro or Cabelas stores. He advised that focus groups be used to craft compelling messages. The focus groups could include a teacher, farmer, angler, hunter, etc. They could provide insight on which messages make sense and are resonating. Chandler expressed support for Adkins' comments but emphasized the need for partnership review to occur prior to any public engagement.

Moore suggested that a grading system be used to evaluate the river ecosystem. She said it could be an effective communications tool to trigger discussion about the reasoning for the grades and what can be done to improve the scores. Olivia Dorothy suggested working with *One Mississippi* and the Mississippi River Connections Collaborative to target audiences and messages.

Jeff Houser advised that the decision to employ or not employ a public engagement campaign should be documented as well as the rationale. Hubbell asked the HNA II tri-chairs to consult with the *ad hoc* UMRR communications team regarding the public review process.

Program Database

Kayleigh Thomas presented on the purposes, design, construction, and applications of the UMRR Database, as well as ongoing work to input historical program information and digitize various features. Thomas said the Database's primary purpose is to combine key UMRR information into a single database application to produce priority program- and project-level reports and analyses. The goals of the Database are to 1) standardize reporting to increase awareness of UMRR's accomplishments of its strategic goals and objectives and 2) support habitat project design, analysis, and performance monitoring to increase effectiveness of applied ecosystem restoration science. Thomas explained that UMRR developed its first HREP database in 1997 and has created several others since then, but they all experienced similar problems. These include a single-user platform that does not allow for efficient multiple-user editing; geographic data and project summary data managed in different, incompatible formats; and the inability to coordinate and standardize updates among the three UMR Districts. Because of these issues, none of the databases ever reached a stage of maturity that would allow them to be useful for analyzing restoration effectiveness. Thomas explained how those issues have been eliminated in a new, user-friendly database, which should provide long-term utility for program partners.

The new UMRR Database integrates and georeferences information related to the program's habitat projects. It is a web-based application that allows for multiple, simultaneous editors within the three UMR Districts. Thomas said the Database was created using Oracle Application Express software, which is a fully supported, no-cost, low maintenance option that includes all available Oracle editions. The software is fully embraced by USACE so it will not change in the foreseeable future. Using only a web-browser, users can develop and deploy professional applications that are both fast and secure.

Thomas listed several advantages of the Oracle Application Express software. It links all program data together, records programmatic history on key issues, standardizes and tailors reporting, allows accessibility to implementing partners, and ensures data quality and consistency. The Database is not a replacement for the program's existing data systems. Thus far in the Database's development, USACE staff have compiled current and historic habitat project data from all three UMR Districts, added habitat project total cost estimates, and combined habitat project status, spatial locations, financial costs, sponsors, documents, and other relevant information into a single framework. This will allow for generating comprehensive reports. In addition, USACE staff have developed several standardized reports, such as Congressional fact sheets; updated the user authentication model to support the definition of fine-grained user roles; performed several quality assurance checks of specific data elements; and established a standing PDT to guide continued Database development and maintenance.

Thomas explained that current efforts to develop the Database include the following:

1. Defining roles and responsibilities among USACE staff for making updates and doing quality assurance
2. Digitizing key habitat project documents and UMRR Coordinating Committee meeting packets and inputting them into the Database
3. Incorporating historical UMRR financial cost data and developing a plan for making routine updates
4. Updating points of contact for habitat project specialty areas
5. Inputting habitat project goals, objectives, and criteria
6. Automating production of UMRR Coordinating Committee quarterly meeting cost reports and plan of work reports
7. Quality assurance reviews of habitat project restoration features

Thomas illustrated example outputs for a habitat project report and a cost report. As the Database continues to mature, Thomas said USACE staff will migrate report outputs and data products to a public-facing server, input habitat project images and contacts and automate the creation of J-Sheet reports. In addition, Corps staff plan to develop reports to support the next UMRR report to Congress, develop a system for tracking and scheduling HREP evaluations, and automate habitat project web fact sheet reports.

Hubbell discussed the value of having the Database to readily respond to Congressional or Administration questions about UMRR. The Database also allows for staff to compare projects over time, such as the range of costs for planning projects.

Jim Fischer expressed appreciation for the Corps' effort to develop the Database noting the current era of accountability and scrutiny over UMRR's budget. In response to a question from Fischer, Thomas explained that the Database's information is easily exportable should a new software application be required.

Habitat Restoration

District Reports

St. Louis District

Brian Markert reported that MVS is planning several habitat projects in the open river reach, including Crains Island, Harlow Island, and Oakwood Bottoms. Design work on Clarence Cannon is complete and will be the District's primary construction investment in FY 2018. MVS is finalizing construction work on the Ted Shank's pump station and will turn that project over to Missouri DoC soon. In addition, the District recently completed the Pool 25 and 26 Islands O&M Manual and sent a close-out letter to Illinois.

Rock Island District

Hubbell reported that MVR is developing plans and specs for Beaver Island with an anticipated construction starts in FY 2018. The District's completed repairs from the Rice Lake flood damages and is planning a ribbon cutting ceremony this fall. MVR plans to turn the Rice Lake project over to Illinois by September 1. Hubbell said MVR is finalizing site visit evaluations of all completed habitat projects over the last two years.

St. Paul District

Novak reported that Conway Lake is preparing to award a construction contract this fiscal year. This project is critical to maintaining full FY 17 execution. Hubbell expressed sincere appreciation to the staff within the District and Division who worked extremely hard on the project.

Next Generation of Habitat Projects

Hubbell explained that the Corps is preparing to start a partnership process to select the next generation of habitat projects when the ecological resilience and HNA II work is complete. Efforts are underway to select a few projects within each District in the interim.

Long Term Resource Monitoring and Science

FY 2017 3rd Quarter Report

Jeff Houser reported that accomplishments of the third quarter of FY 2017 include the publication of two technical reports regarding:

- Mapping areas invaded by reed canary grass in Pools 2-13
- Detecting *Potamogeton crispus* in LTRM summer surveys, estimating its seasonal biomass and nutrient standing stocks, and linking it to water quality conditions in Pools 7 and 8

Jennie Sauer acknowledged that Audubon contributed funding to the reed canary grass mapping effort. Sauer said it offered a great opportunity to leverage resources.

Houser reported that publication is pending final review on a manuscript describing the fundamental relationships affecting the UMRS's ecological resilience. The draft manuscript of general resilience indicators will be provided to the UMRR resilience work group in early September. The indicators were updated following input at the May 2017 UMRR Joint Workshop of Ecosystem Resilience and HNA II. Next steps of the ecological resilience 4 effort include 1) analyzing data for developing specified resilience indicators and 2) hosting a resilience work group web-based conference call in September.

FY 2017 Science Proposals

Karen Hagerty explained that, in light of UMRR's increased FY 2017 budget, an additional \$2.5 million is available for science-related projects. The funds will be used to advance four field station research proposals and landscape pattern research, refresh equipment, further operationalize ecosystem resilience concepts, test the camera for use in acquiring the 2020 LC/LU dataset, and modernize the water quality lab. Hagerty said that Marv Hubbell plans to submit a formal proposal in mid-August to the UMRR Coordinating Committee for funding specific research and equipment needs and will ask the Committee for its review in September. The Committee's endorsement will be needed with sufficient time for the Corps to execute funding agreements before the end of FY 2017.

Hagerty explained that two SOWs for LTRM will be developed again in FY 2018, with a SOW developed for LTRM base monitoring and a second SOW developed for science in support of restoration and management. Hagerty said the two SOWs together amount to what the UMRR Coordinating Committee determined to fully fund LTRM. Hagerty said a request for science proposals will be distributed to partners in late August and will focus on themes relating to the UMRR's 2015-2025 Strategic Plan and research frameworks, ecosystem health and resilience, systemic efforts and analyses, and UMRR contributions to the overall UMRS.

Hagerty said she anticipates that the A-Team will review the FY 2018 proposals for science in support of restoration and management at its January 2018 meeting. The proposals would then be presented to the UMRR Coordinating Committee at its February 2018 quarterly meeting for consideration of endorsement.

Hagerty reviewed allocations of LTRM's FY 2018 budget of \$5.76 million as follows:

- Field Stations
 - Pool 4 — \$560,555
 - Pool 8 — \$536,9393
 - Pool 13 — \$464,996
 - Pool 26 — \$414,703
 - Open River — \$385,605
 - Illinois River — \$472,791
 - Science meeting travel — \$7,363
- UMESC — \$2,840,624
- Corps technical representatives — \$80,000

Houser said brief descriptions of the seven submitted proposals are provided on pages C-1 to C-3 of the agenda packet. He provided more detailed information about the four FY 2017 research proposals. These include:

1. The role of crustacean zooplankton in the overall plankton community dynamics in Lake Pepin
2. Water clarity in Pool 8: the contributions of changes in external inputs and changes in internal conditions to long term trends
3. Developing methods estimating submersed aquatic vegetation biomass in the UMR to expand capabilities in the UMR and improve the utility of the long term vegetation data
4. Using measurements of age, recruitment, growth rates, and mortality to understand population demographics of smallmouth buffalo in the UMRS

A-Team Report

Matt Vitello reported that the A-Team met remotely on August 1, 2017. Discussion topics included the UMR ecological resilience effort, science research proposals, and the next Status and Trends Report. In addition, Sara Tripp presented on managing the UMRS as a migratory swimway for fish. The A-Team's next meeting will be held in conjunction with the UMRCC Fish Tech Group on October 3, 2017 in Lake Pepin.

Other Business

Appreciation to UMRBA Staff

Marv Hubbell expressed appreciation to Dave Hokanson for his contributions to UMR over his tenure with UMRBA. Hokanson accepted a new position at Minnesota Department of Health. Hubbell congratulated Kirsten Mickelsen on her promotion to Executive Director of UMRBA.

Future Meetings

The upcoming quarterly meetings are as follows:

- **November 2017 — St. Paul**
 - UMRBA quarterly meeting — November 7
 - **UMRR Coordinating Committee quarterly meeting — November 8**
- **February 2018 — Quad Cities**
 - UMRBA quarterly meeting — February 6
 - **UMRR Coordinating Committee quarterly meeting — February 7**
- **May 2018 — St. Louis**
 - UMRBA quarterly meeting — May 15
 - **UMRR Coordinating Committee quarterly meeting — May 16**

With no further business, the meeting adjourned at 12:20 p.m.

**UMRR Coordinating Committee Attendance List
August 9, 2017**

UMRR Coordinating Committee Members

| | |
|------------------|---|
| Don Balch | U.S. Army Corps of Engineers, MVD |
| Sabrina Chandler | U.S. Fish and Wildlife Service, UMR Refuges |
| Jeff Houser | U.S. Geological Survey, UMESC [On behalf of Mark Gaikowski] |
| Dan Stephenson | Illinois Department of Natural Resources |
| Randy Shultz | 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 |
| Marty Adkins | Natural Resources Conservation Service |

Others In Attendance

| | |
|---------------------|--|
| Brian Chewning | U.S. Army Corps of Engineers, MVD via phone |
| Tom Novak | U.S. Army Corps of Engineers, MVP |
| Andy Barnes | U.S. Army Corps of Engineers, MVR |
| Jody Creswell | U.S. Army Corps of Engineers, MVR |
| Marvin Hubbell | U.S. Army Corps of Engineers, MVR |
| Karen Hagerty | U.S. Army Corps of Engineers, MVR |
| Kayleigh Thomas | U.S. Army Corps of Engineers, MVR |
| John Peukert | U.S. Army Corps of Engineers, MVS |
| Brian Markert | U.S. Army Corps of Engineers, MVS |
| Tim Eagan | U.S. Army Corps of Engineers, MVS |
| Sharonne Baylor | U.S. Fish and Wildlife Service, UMR Refuges |
| Sam Finney | U.S. Fish and Wildlife Service, UMR Refuges |
| Sara Schmuecker | U.S. Fish and Wildlife Service, RIFO |
| Amy Beussink | U.S. Geological Survey, Missouri Water Science Center |
| Kelly Warner | U.S. Geological Survey, Iowa-Illinois Water Science Center |
| Kristen Bouska | U.S. Geological Survey, UMESC |
| Jennifer Dieck | U.S. Geological Survey, UMESC |
| Nate De Jager | U.S. Geological Survey, UMESC |
| David Grey | U.S. Geological Survey, UMESC |
| Bill Richardson | U.S. Geological Survey, UMESC |
| Jim Rogala | U.S. Geological Survey, UMESC |
| Jennie Sauer | U.S. Geological Survey, UMESC |
| Molly Van Appledorn | U.S. Geological Survey, UMESC |
| Steve Galarneau | Wisconsin Department of Natural Resources |
| Olivia Dorothy | American Rivers |
| Ken Lubinski | (No Affiliation) |
| Brad Walker | Missouri Coalition for the Environment |
| Gretchen Benjamin | The Nature Conservancy |
| Dave Hokanson | Upper Mississippi River Basin Association |
| Kirsten Mickelsen | Upper Mississippi River Basin Association |

ATTACHMENT B

Habitat Needs Assessment II Update

(B-1 to B-8)

HNA-II Update

Purpose of HNA II: To provide information and recommendations that help inform the UMRR Program in implementing projects and monitoring that can achieve the vision of a healthier and more resilient UMRS.

- must provide clear linkage between resilience and HNA II
- must provide clear integration among ecosystem monitoring, research, and rehabilitation
- must clearly articulate the need for ongoing river restoration, monitoring, and research

The focus of this effort is on general ecosystem structure, function, processes, and the controlling variables that affect the health and resilience of the UMRS and help inform and identify future work.

It will be a system assessment/inventory of existing conditions based on selected indicators summarized at pool scale with the capability to aggregate at the geomorphic/floodplain reach as appropriate

See Attachment A for the Steering Committee's agreed upon "HNA II: what it is, what it's not"

Assumptions/Constraints

1. based on coarse level of analyses dependent on the resolution of the dataset and data layers (pool-scale resolution)
2. based on datasets available systemically
3. Based on data layers available systemically
 - a. Aquatic Area Classification
 - b. Floodplain Area Classification
4. Use of 2010 land cover data
5. Limited to geographic scope based on authorizing language
6. Previous efforts to develop comprehensive ecosystem management-based goals and objectives for the UMRS formed the basis for HNA-II.¹

Terminology:

- Habitat – collections of structural, physical, and chemical conditions that often co-vary across the surface of the UMRS¹
- Indicator - quantitative measures or metrics developed for UMRS ecosystem objectives
- Functional Class – Data derived broad habitat categories based on physical and chemical characteristics; provide common systemic definitions for the program
 - Lotic
 - Lentic
 - Floodplain
- Habitat Objectives – based off the UMRS Ecosystem Restoration Report (2009)
http://www.mvr.usace.army.mil/Portals/48/docs/Environmental/EMP/UMRR_Ecosystem_Restoration_Objectives_2009.pdf

Deliverable 1: *Information Summary Report – Existing State of the System*

¹ From *Information Summary Report - Draft October 2017*

Purpose: Summarizes information developed in support of the Upper Mississippi River Restoration (UMRR) Program’s Habitat Needs Assessment-II (HNA-II). This document provides background material, rationale for indicator development (including brief methods, results and discussion), cross-indicator synthesis of results, and future directions¹. This document builds on previous efforts by developing datasets and indicators for as many UMRS objectives as possible (Attachment B). Not all objectives from the UMRS Ecosystem Restoration Objectives Report (2009) effort were moved forward for the HNA due to lack of systemic information, not within UMRR Program authority, too vague, etc. This decision was made by the Steering Committee on this ecosystem management approach in order to have holistic system-level assessment of the UMRS. Hence, HNA-II will be a quantification of the stated objectives of the UMRR program.

HNA-II Indicators (Subset of resilience indicators agreed upon by the Steering Committee)

1. Connectivity
 - a. Longitudinal (Aquatic)
 - b. Longitudinal (Floodplain)
 - c. Lateral (River-Floodplain)
2. Diversity and Redundancy
 - a. Aquatic Hydrogeomorphic Areas
 1. *Lentic functional classes*
 2. *Lotic functional classes*
 - b. Aquatic Vegetation
 - c. Floodplain Hydrogeomorphic Areas (*Floodplain functional class*)
 - d. Floodplain Vegetation
3. Slow Variables and Feedbacks
 - a. Water Surface Elevation Fluctuations
 - b. Total Suspended Solids Concentrations
 - c. Sedimentation in Off-Channel Areas
 - d. Floodplain Forest Succession

Deliverable 2: *Management Response to Information – System Assessment*

Purpose: To build upon the information developed from Deliverable 1, HNA II will provide a system assessment using indicators developed through the resilience effort in order to help inform the Program where we need to focus our efforts to make the UMRS more resilient into the future.

NEXT STEPS:

The process of how to complete the system assessment is still being developed and the **Tri-Chairs are requesting feedback/input on how to approach defining acceptable ranges for the indicators – does the UMRR-CC even desire to set targets to “Grade” the system?** If we set targets how to set them? Based on a median? Internal reference? Historic condition? Target for a particular community? Use the same target system-wide or set targets by river reach? How would we reach consensus?

Tri-chairs recommend the partnership through the Steering Committee helps steer the process in developing targets/acceptable ranges for the indicators. Without some form of a target/acceptable range identified for the indicators, the assessment would be limited to a status of the system rather than where in the system we are “unacceptable” and should focus or work into the future. Figure 1, outlines some general steps still needed to be performed to complete the HNA-II effort.

Schedule – Yet to be finalized. Tri-Chairs will work on updating current schedule based upon direction from the UMRR-CC in terms of setting targets for indicators. We understand that this effort may be complex and will take time; therefore **we would like feedback on** expected timeline needed to have these discussions within the partnership before updating the schedule to completion.

Steering Committee Seeks Concurrence from the UMRR-CC on the following recommendations:

- 1) Use of the aquatic and floodplain functional classes to represent broad habitat categories for the system
- 2) Move forward with attempting to develop “acceptable ranges” for the HNA II Indicators (realizing that this will be a challenge) by pool and floodplain reach (Upper Impounded, Lower Impounded, Illinois River, and Unimpounded)

Steering Committee Seeks Recommendations from the UMRR-CC on the following items:

- 1) Decision on identifying target/acceptable ranges for the HNA II indicators
- 2) Expected timeframe agencies/organization require to digest the information

DRAFT

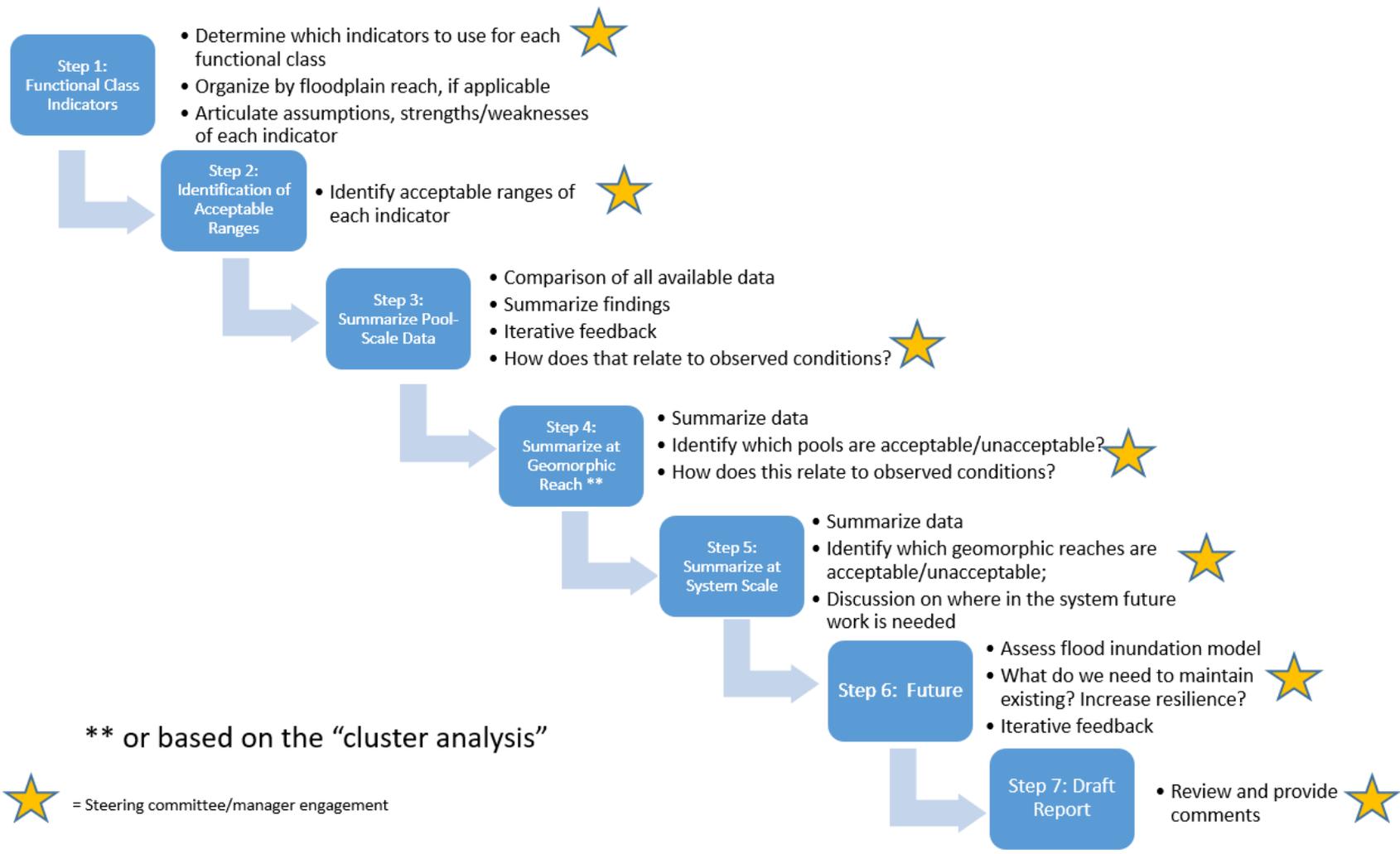


Figure 1. Generalized steps to complete the HNA-II

Attachment A. HNA II

What it is and What it is Not and What is yet to Come

What it is:

- PURPOSE
 - To provide information and recommendations that help inform the UMRR program in implementing projects and monitoring that can achieve the vision of a healthier and more resilient UMRS
 - must provide clear linkage between resilience and HNA II
 - must provide clear integration among ecosystem monitoring, research, and rehabilitation
 - must clearly articulate the need for ongoing river restoration, monitoring, and research
 - WRDA 1999 Requirement: 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.
- document focused on general ecosystem structure, function, processes, and the controlling variables that affect the health and resilience of the UMRS and aid in identifying future work
- Improve current understanding of habitat needs utilizing UMRR's experience and knowledge generated over its 30-year lifetime
- Maintain UMRR's national and international role in large river ecosystem rehabilitation, monitoring, and research
- communication tool to show how this program is restoring a more resilient and healthier UMRS
- Provide a compelling story about what is needed to restore the ecosystem and how the program partnership intends to do that
- *help* inform and identify next generation of projects
- system assessment/inventory of existing conditions based on selected indicators summarized at the *pool* scale with the capability to aggregate at the geomorphic/floodplain reach as appropriate
 - based on coarse level of analyses dependent on the resolution of the dataset and data layers
 - based on datasets and layers available systemically
 - Methods of indicator development, strengths/weaknesses of each indicator, as well as ecological causes and consequences
 - Define optimal/acceptable ranges of each indicator
 - Graphical depiction of the data/indicator
 - Conclusions on the existing state of the system
- Identify additional data needs, models, etc.
- limited in geographic scope based on the authorizing language

HNA II will NOT:

- be used to formulate individual HREPs
- be used to select or rank HREPs for implementation
- be a watershed plan
- dictate where a project will be
- develop HEP/AHAG/WHAG/HSI models for project alternative comparison
- assess the quality of habitat for a species or community
- identify what management actions to be implemented

DESIRED NEXT STEPS

- Summary of HNA II will be included in the 2022 UMRR Report to Congress
- Refinement of data layers and models for application at the project-scale
- Recommendations and Outputs will be used to focus UMRR's restoration and scientific research over the next 10-20 years
- Develop criteria to evaluate management tools and actions and get to habitat for what
- Development of HEP/AHAG/WHAG/HSI community based models for alternative comparison
- Further refinement of hydrologic models
 - in relation to connectivity to determine pre-dam conditions as a "reference" for historic condition of flowing habitat.
 - include discharge with water surface elevations
 - Lower tributary effects

Attachment B. *Essential Ecosystem Characteristics and related management and restoration objectives from the 2009 UMRS Ecosystem Restoration Objectives report. HNA-II indicators (i.e., quantification of specific objectives) and topical descriptions that address each objective within the context of resilience principles are also listed. (From the Information Summary Report – Draft October 2017). Items highlighted in green are moved forward as part of the HNA II effort.*

| Essential Ecosystem Characteristic | Reach Planning Objective | HNA-II Indicator | HNA-II Category |
|---|--|---|------------------------------|
| Hydraulics and hydrology | A more natural stage hydrograph | Water Surface Elevation Fluctuations | Slow Variables and Feedbacks |
| | Restored hydraulic connectivity | Lateral (River-Floodplain) Connectivity | Connectivity |
| | Naturalize the hydrologic regime of tributaries | A | |
| | Increase storage and conveyance of flood water on the floodplain | Lateral (River-Floodplain) Connectivity | Connectivity |
| | | | |
| Biogeochemistry | Improved Water Clarity | Total Suspended Solids | Slow Variables and Feedbacks |
| | Reduce Nutrient Loading | B | |
| | Reduce Sediment Loading | Total Suspended Solids | Slow Variables and Feedbacks |
| | Reduce Contaminants loading | C | |
| | Water Quality conditions sufficient to support native species | Total Suspended Solids | Slow Variables and Feedbacks |
| | | | |
| Geomorphology | Restore Rapids | A | |
| | Restore Sediment Transport Regime | Sedimentation in off-channel areas | Slow Variables and Feedbacks |
| | Restore Lower Tributary Valleys | D | |
| | Restore Bathymetric Diversity | Sedimentation in off-channel areas | Slow Variables and Feedbacks |
| | Restored floodplain topographic diversity | Floodplain Hydrogeomorphic Areas | Diversity and Redundancy |
| | Restore lateral hydraulic connectivity | Lateral (River-Floodplain) Connectivity | Connectivity |
| | | Floodplain Hydrogeomorphic Areas | Diversity and Redundancy |
| | | | |
| Habitat | Restore Habitat Connectivity | Longitudinal Floodplain Connectivity | Connectivity |
| | Restore Riparian/Floodplain Habitat | Floodplain Hydrogeomorphic Areas | Diversity and Redundancy |
| | | Floodplain Vegetation | Diversity and Redundancy |
| | | Floodplain Forest Succession | Slow Variables and Feedbacks |

| Essential Ecosystem Characteristic | Reach Planning Objective | HNA-II Indicator | HNA-II Category |
|------------------------------------|---|--------------------------------------|------------------------------|
| Habitat (Continued) | Restore Aquatic off-channel areas | Aquatic Hydrogeomorphic Areas | Diversity and Redundancy |
| | | Sedimentation in off-channel areas | Slow Variables and Feedbacks |
| | Restore channel areas (including side channels) | Aquatic Hydrogeomorphic Areas | Diversity and Redundancy |
| | Restore native aquatic vegetation | Aquatic Vegetation Diversity | Diversity and Redundancy |
| | Restore a floodplain corridor | Longitudinal Floodplain Connectivity | Connectivity |
| | Restore Floodplain wetlands | Floodplain Vegetation Diversity | Diversity and Redundancy |
| | Restore rare and native habitats | <i>E</i> | |
| | | | |
| Biota | Aquatic Vegetation | Aquatic Vegetation Diversity | Diversity and Redundancy |
| | Floodplain Forest and Prairies | Floodplain Vegetation Diversity | Diversity |
| | | Floodplain Forest Succession | Slow Variables and Feedbacks |
| | Native Fish | <i>F</i> | |
| | Native Mussels | <i>F</i> | |
| | Native Birds | <i>F</i> | |
| | Reduce Effects of Invasive Species | <i>G</i> | |
| | Viable populations of native species | <i>E</i> | |

- A) Not enough standardized information to assess/beyond scope of HNA-II*
- B) Data available for some tributaries, not enough to make informed assessment; not within UMRR program authority*
- C) Lacking system-wide data*
- D) Non enough topographic/geomorphic data to assess; not within UMRR program authority*
- E) Too vague*
- F) Only biota considered to be habitat for other species were considered in HNA-II*
- G) Data for some invasive species, but not all. Considered a biological effect and not 'habitat'*

Objectives added during HNA-II process and not part of UMRS goals and objectives report

ATTACHMENT C

Long Term Resource Monitoring and Science

- **FY 2014-FY 2015 UMRR Science Activities in Support of Restoration and Management (10/20/2017) (C-1)**
- **FY 2017 UMRR Science Activities in Support of Restoration and Management (10/2017) (C-2)**
- **Base Monitoring Scope of Work thru 1st Quarter of FY 2018 (10/20/2017) (C-3 to C-5)**
- **FY 2018 UMRR Science Activities in Support of Restoration and Management (10/20/2017) (C-6 to C-11)**

UMRR Science in Support of Restoration and Management
 FY2014-FY2015 Scopes of Work
 October 2017 Status

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|---|---|----------------------|----------------------|----------------|---|----------------------------------|
| Development of Mussel Vital Rates | | | | | | |
| 2014MVR1 | Brief summary report | 30-Sep-15 | | 30-Sep-15 | completed, in UMESC review | Newton, Zigler, Davis |
| 2014MVR2 | Progress update | 30-Sep-16 | | 30-Sep-16 | | Newton, Zigler, Davis |
| 2014MVR3 | Completion report on a vital rates of native mussels at West Newton Chute, UMRS | 30-Sep-17 | 30-Oct-17 | | Statistics took longer than anticipated. Reconciling comments. | Newton, Zigler, Davis |
| Effects of Nutrient Concentrations on Zoo- and Phytoplankton | | | | | | |
| 2014NC1 | Counting of phytoplankton samples | 13-Mar-15 | | 2-Mar-15 | | Giblin, Campbell, Houser, Manier |
| 2014NC2 | Database completed and analysis completed | 13-Mar-16 | 28-Feb-18 | | Working With UWL staff. Analysis partially complete. | Giblin, Campbell, Houser, Manier |
| 2014NC3 | Full manuscript completed | 13-Mar-18 | | | | Giblin, Campbell, Houser, Manier |
| 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-Mar-18 | | delayed due to field station staffing shortages and will also include data from 2015D15 | Burdis |
| Predictive Aquatic 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 | 31-Dec-17 | | Resolving model discrepancy took longer than anticipated. Last extension. | Yin, Rogala, Ingvalson |

UMRR Science in Support of Restoration and Management
FY2017 Wrokplan Scope of Work
October 2017 Status

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|--|--|----------------------|----------------------|----------------|----------|--|
| Extrinsic and intrinsic control of water clarity in Pool 8 of the UMR | | | | | | |
| 2018BX1 | Draft manuscript: Extrinsic vs Intrinsic Control of Water Clarity in the UMR | 30-Mar-18 | | | | Drake, Weeks, Kalas, Fischer, Houser and Jankowski |
| Developing methods of estimating SAV biomass in the UMR to expand the capabilities within the UMRR program and improve the utility of the long-term vegetation data | | | | | | |
| 2018BIO1 | Completion of USFWS collaborative field work, data entry, laboratory work and LTRM additional field data collection | 30-Aug-17 | | | | Drake, Holman, Lund |
| 2018BIO2 | Draft LTRM Completion Report: Estimating biomass of submersed aquatic vegetation in the UMR | 30-Mar-18 | | | | Drake, Holman, Lund |
| 2018BIO3 | Final LTRM Completion report: Estimating biomass of submersed aquatic vegetation in the UMR | 30-Oct-18 | | | | Drake, Holman, Lund |
| Plankton community dynamics in Lake Pepin - the role of curstacean zooplankton | | | | | | |
| 2018PLK1 | Three year (2012-2014) data set of Lake Pepin crustacean zooplankton data. Crustacean zooplankton samples collected at four fixed sites in Lake Pepin will be processed to obtain species composition and biomass estimates | 30-Mar-18 | | | | Burdis |
| 2018PLK2 | Analysis: Data would be paired with existing rotifer (2015D15) and phytoplankton (2015LPP2) | 31-Dec-18 | | | | Burdis |
| Smallmouth buffalo population demographics of the UMRS | | | | | | |
| 2018MMBF1 | Collection of smallmouth buffalo for otoliths | 31-Oct-17 | | | | Field Stations Fish Component Staff |
| 2018MMBF2 | Transfer of fish to IRBS | 30-Nov-17 | | | | Solomon, Maxson |
| 2018MMBF3 | Processing of otoliths | 30-May-18 | | | | Solomon, Maxson |
| 2018MMBF4 | Analysis: Mixed modeling approach to separate growth responses into | 30-Jun-18 | | | | Ickes, Solomon, Maxson |
| 2018MMBF5 | Draft analysis methods and results write-up | 30-Sep-18 | | | | Ickes |
| 2018MMBF6 | Draft LTRM Completion Report | 30-May-19 | | | | Solomon, Maxson, et al. |
| 4-Band aerial camera acquisition, integration, and testing for the 2020 LCU mission | | | | | | |
| 2018CAM1 | Collection of test 4-band imagery, evaluation of image quality and image processing using HT Condor distributed processing software. | Summer 2018 | | | | Robinson |
| 2018CAM2 | Collection and evaluation of sample floodplain at various resolutions above and below Lock and Dam 13 (where the Upper Mississippi River transitions from a floodplain composed complex aquatic vegetation above to a more channelized system that is largely agrarian in nature below). | Summer 2019 | | | | Robinson |
| 2018CAM3 | Draft LTRM Completion report detailing integration and testing procedures and recommendations of optimal image resolution for the 2020 systemic imagery collection. | Fall 2019 | | | | Robinson |
| 2018CAM4 | Final LTRM Completion report with sample images detailing integration and testing procedures and recommendations of optimal image resolution and final flight plan for the 2020 systemic imagery collection. | Winter 2019 | | | | Robinson |
| UMRR LTRM WQ lab modernization | | | | | | |
| 2018LM1 | Contract design work | 30-Sep-18 | | | | Goede, Yuan, Sauer |
| 2018LM2 | Purchase of walk-in refrigerator/freezer | 30-Sep-18 | | | | Yuan |
| 2018LM3 | Construction complete | 30-Sep-20 | | | | Goede, Yuan, Sauer |

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|--|---|----------------------|----------------------|----------------|----------|---|
| Aquatic Vegetation Component | | | | | | |
| 2018A1 | Complete data entry and QA/QC of 2017 data; 1250 observations. | | | | | |
| | a. Data entry completed and submission of data to USGS | 30-Nov-17 | | | | Lund, Drake, Bales |
| | b. Data loaded on level 2 browsers | 15-Dec-17 | | | | Schlifer |
| | c. QA/QC scripts run and data corrections sent to Field Stations | 28-Dec-17 | | | | Sauer, Schlifer |
| | d. Field Station QA/QC with corrections to USGS | 15-Jan-18 | | | | Lund, Drake, Bales |
| | e. Corrections made and data moved to public Web Browser | 30-Jan-18 | | | | Yin, Sauer, Schlifer, Caucutt |
| 2018A2 | Web-based: Creating surface distribution maps for aquatic plant species in Pools 4, 8, and 13; 2017 data | 31-Jul-18 | | | | Yin, Rogala, Schlifer |
| 2018A3 | Wisconsin DNR annual summary report 2017 that combines current year observations from LTRM with previous years' data, for the fish, aquatic vegetation, and water quality components. | 30-Sep-18 | | | | Drake, Bartels, Hoff, Kalas |
| 2018A4 | Complete aquatic vegetation sampling for Pools 4, 8, and 13 (Table 1) | 31-Aug-18 | | | | Yin, Lund, Drake, Bales |
| 2018A5 | Pool 4: Graphical summary and maps of aquatic vegetation current status and long-term trends. | 30-Dec-17 | | | | Lund |
| 2018A6 | Pool 8: Graphical summary and maps of aquatic vegetation current status and long-term trends. | 30-Dec-17 | | | | Drake, Weeks |
| Intended for distribution | | | | | | |
| LTRM Technical Report: Ecological Assessment of High Quality UMRS Floodplain Forests (2007APE12; Chick, Guyon, Battaglia) (in final edits with author) | | | | | | |
| LTRM Technical Report; Experimental and Comparative Approaches to Determine Factors Supporting or Limiting Submersed Aquatic Vegetation in the Illinois River and its Backwaters (2008APE5, Sass) (in USGS review) | | | | | | |
| LTRM completion report: FY05-07 data--Analysis and support of aquatic vegetation sampling data in Pools 6, 9, 18, and 19 (2008APE4a; Yin) (in USGS review) (With author for revision) | | | | | | |
| Manuscript: Have the recent increases in aquatic vegetation in Pools 5 and 8 been the result of water level management drawdowns, HREPs, or natural fluctuations? (2009APE1a; Yin) (in USGS review) (With author for revision) | | | | | | |
| Manuscript: A statistical model of species occupancy using the LTRM aquatic vegetation data (2013A7; Yin) (in USGS review) (With author for revision) | | | | | | |
| Fisheries Component | | | | | | |
| 2018B1 | Complete data entry, QA/QC of 2017 fish data; ~1,590 observations | | | | | |
| | a. Data entry completed and submission of data to USGS | 31-Jan-18 | | | | DeLain, Bartels, Bowler, Ratcliff, Gittinger, West, Solomon, Maxson |
| | b. Data loaded on level 2 browsers; QA/QC scripts run and data corrections sent to Field Stations | 15-Feb-18 | | | | Ickes, Schlifer |
| | c. Field Station QA/QC with corrections to USGS | 15-Mar-18 | | | | DeLain, Bartels, Bowler, Ratcliff, Gittinger, West, Solomon, Maxson |
| | d. Corrections made and data moved to public Web Browser | 30-Mar-18 | | | | Ickes, Sauer, and Schlifer |
| 2018B2 | Update Graphical Browser with 2017 data on Public Web Server. | 31-May-18 | | | | Ickes, Sauer, and Schlifer |
| 2018B3 | Complete fisheries sampling for Pools 4, 8, 13, 26, the Open River Reach, and La Grange Pool (Table 1) | 31-Oct-18 | | | | Ickes, Sauer, DeLain, Bartels, Bowler, Ratcliff, Gittinger, West, Solomon, Maxson, Schlifer |
| 2018B4 | Summary Letter: Floodplain fisheries sampling | 31-Oct-18 | | | | West, Sobotka |
| 2018B5 | IDNR Fisheries Management State Report: Fisheries Monitoring in Pool 13, Upper Mississippi River, 2017 | 30-Jun-18 | | | | Bowler |

Upper Mississippi River Restoration
Long Term Resource Monitoring Element
FY2018 Base Scope of Work

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|--|---|----------------------|----------------------|----------------|----------|--|
| 2018B6 | Sample collection, database increment, Summary letter on Asian carp age and growth: collection of cleithral bones | 31-Jan-18 | | | | Solomon, Maxson, Casper |
| 2018B8(D) | Database increment: Stratified random day electrofishing samples collected in Pools 9–11 | 30-Sep-18 | | | | Bowler |
| 2018B9(D) | Database increment: Stratified random day electrofishing samples collected in Pools 16–18 | 30-Sep-18 | | | | Bowler |
| 2018B10 | Summary Letter: Open River Chevron Dike monitoring | 31-Oct-18 | | | | West, Sobotka |
| 2018B11 | Summary Letter: Evaluating the Fish Community in a rare Backwater Habitat in the Middle Mississippi River 2017 | 30-Sep-18 | | | | West |
| 2017B4 | Summary Letter: Floodplain fisheries sampling | 31-Oct-17 | | | | West, Sobotka |
| 2017B10 | Summary Letter: Open River Chevron Dike monitoring | 31-Oct-17 | | | | West |
| Intended for distribution | | | | | | |
| Completion report: LTRM Fisheries Component collection of six darter species from 1989–2004. (2006B13; Ridings) (in USGS review) | | | | | | |
| LTRM technical report; Setting quantitative fish management targets for LTRM monitoring (2008APE2; Sass) (in USGS review) | | | | | | |
| LTRM Completion report, compilation of 3 years of sampling: Fisheries (2009R1Fish; Chick et al.) (in USGS review) | | | | | | |
| 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 edited) | | | | | | |
| Manuscript: Determining environmental history of three sturgeon species in the Upper, Middle, and Lower Mississippi Rivers. (2013B22; Phelps) (Phelps, Q. E., Hupfeld, R. N. and Whitley, G. W. 2017. Lake sturgeon <i>Acipenser fulvescens</i> and shovelnose sturgeon <i>Scaphirhynchus platyrhynchus</i> environmental life history revealed using pectoral fin-ray microchemistry: implications for interjurisdictional conservation through fishery closure zones. J Fish Biol, 90: 626–639. doi:10.1111/jfb.13242) | | | | | | |
| Manuscript: Age-0 sturgeon habitat associations in the free flowing portion of the Upper Mississippi River (2012B5; Tripp, Phelps, Herzog) (Sechler, D. R., Q. E. Phelps, S. J. Tripp, J. E. Garvey, D. P. Herzog, D. E. Ostendorf, J. W. Ridings, J. W. Crites & R. A. Hrabik. 2012. Habitat for Age-0 Shovelnose Sturgeon and Pallid Sturgeon in a Large River: Interactions among Abiotic Factors, Food, and Energy Intake. North American Journal of Fisheries Management Vol. 32, Iss. 1, Pages 24-31, 2012 http://dx.doi.org/10.1080/02755947.2012.655848) | | | | | | |
| Water Quality Component | | | | | | |
| 2018D1 | Complete calendar year 2017 fixed-site and SRS water quality sampling | 31-Dec-17 | | | | Jankowski, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka |
| 2018D2 | Complete laboratory sample analysis of 2017 fixed site and SRS data; Laboratory data loaded to Oracle data base. | 15-Mar-18 | | | | Yuan, Schlifer |
| 2018D3 | 1st Quarter of laboratory sample analysis (~12,600) | 30-Dec-18 | | | | Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Cook, Sobotka |
| 2018D4 | 2nd Quarter of laboratory sample analysis (~12,600) | 30-Mar-18 | | | | Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka |
| 2018D5 | 3rd Quarter of laboratory sample analysis (~12,600) | 29-Jun-18 | | | | Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka |
| 2018D6 | 4th Quarter of laboratory sample analysis (~12,600) | 28-Sep-18 | | | | Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka |

Upper Mississippi River Restoration
Long Term Resource Monitoring Element
FY2018 Base Scope of Work

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|--|---|---|----------------------|----------------|----------|---|
| 2018D7 | Complete QA/QC of calendar year 2017 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-18 | | | | Schlifer, Rogala, Jankowski |
| | b. Field Station QA/QC; USGS QA/QC. | 15-Apr-18 | | | | Jankowski, Rogala, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka |
| | c. Corrections made and data moved to public Web Browser | 30-Apr-18 | | | | Rogala, Schlifer, Jankowski |
| 2018D8 | Complete FY2018 fixed site and SRS sampling for Pools 4, 8, 13, 26, Open River Reach, and La Grange Pool | 30-Sep-18 | | | | Jankowski, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka |
| 2018D9 | WEB-based annual Water Quality Component Update w/ 2016 data on Server. | 30-May-18 | | | | Rogala |
| 2018D10 | Final LTRM Completion report: Evaluation of water quality data from automated sampling platforms | 30-Sep-17 | 30-Sep-18 | | | Soeken-Gittinger, Lubinski, Chick, Houser |
| 2018D11 | 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-18 | | | | Kalas, Hoff, Bartel, Drake |
| 2015D12 | Final report/manuscript: Developing continuous water quality monitoring methods in the UMR | 1-Sep-17 | 1-Sep-18 | | | Chick, Houser |
| Intended for distribution | | | | | | |
| Completion report: Examining nitrogen and phosphorus ratios N:P in the unimpounded portion of the Upper Mississippi River (2006D9; Hrabik & Crites) (in USGS review) | | | | | | |
| Completion report, compilation of 3 years of sampling: Water Quality (2009R1WQ; Giblin, Burdis) (in USGS review) | | | | | | |
| 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) (in USGS review) | | | | | | |
| Land Cover/Land Use with GIS Support | | | | | | |
| 2018LC1 | Maintenance ArcGIS server | 30-Sep-18 | | | | Hlavacek, Fox, Rohweder |
| 2018LC2 | Aerial Photo scanning (Pools 11-12; 14-22; 24-25) | 30-Sep-18 | | | | Hlavacek |
| 2018LC4 | Updates on progress for land cover products listed. | New progress reported in the quarterly activities. Percent complete updated 30 Sept 2018. | | | | Robinson |
| Data Management | | | | | | |
| 2018M1 | Update vegetation, fisheries, and water quality component field data entry and correction applications. | 30-May-17 | | | | Schlifer |
| 2018M2 | Load 2017 component sampling data into Oracle tables and make data available on Level 2 browsers for field stations to QA/QC. | 30-Jun-17 | | | | Schlifer |
| Quarterly Activities | | | | | | |
| 2018QR1 | Submittal of quarterly activities | 30-Jan-18 | | | | All LTRM staff |
| 2018QR2 | Submittal of quarterly activities | 13-Apr-18 | | | | All LTRM staff |
| 2018QR3 | Submittal of quarterly activities | 13-Jul-18 | | | | All LTRM staff |
| 2018QR4 | Submittal of quarterly activities | 12-Oct-18 | | | | All LTRM staff |
| Equipment Inventory | | | | | | |
| 2018ER1 | Property inventory and tracking | 15-Nov-18 | | | | LTRM staff as needed |

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2018 Science in Support of Restoration and Management Scope of Work

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|--|---|----------------------|----------------------|----------------|----------|---|
| Developing and Applying Indicators of Ecosystem Resilience to the UMRS | | | | | | |
| 2018R1 | Updates provided at <u>each</u> quarterly UMRR CC meeting and A team meeting | Various | | | | Bouska, Houser |
| 2018R2 | Submit General resilience manuscript for peer-reviewed publication. Bouska, K. L., J. N. Houser, N. R. De Jager, J. Rogala, and M. Van Appledorn. Applying concepts of general resilience to large river ecosystems: case studies from the Upper Mississippi and Illinois rivers. | 30-Jan-18 | | | | Bouska, Houser |
| 2018R3 | Draft report summarizing trends in controlling variables and research framework for specified resilience | 15-Sep-18 | | | | Bouska, Houser |
| Intended for Distribution | | | | | | |
| Manuscript: Bouska, K.B., J.N. Houser, and N. De Jager. Developing a shared understanding of the Upper Mississippi River: the foundation of a resilience assessment. (Accepted with revisions by Ecology and Society) | | | | | | |
| Modelling and mapping current and projected future habitats of the Upper Mississippi River System (HNA-II) | | | | | | |
| 2018HNA1 | Draft HNA-II chapter documenting informational content for HNA-II | 30-Dec-17 | | | | De Jager, Rogala, Bouska, Houser, Van Appledorn, Rohweder, Fox, Rubser |
| 2017AH8 | Draft Appendix A in 2018HNA1-Summarize methods used to develop Aquatic Areas | 30-Dec-17 | | | | Jim Rogala, Janis Ruhser, Jason Rohweder, Jeff Houser |
| 2017AH9 | Complete Aquatic Areas Geodatabase | 30-Dec-17 | | | | Jason Rohweder and Jim Rogala |
| 2017FAH3 | Complete Appendix C in 2018HNA1-Summarize methods used to develop sedimentation model | 30-Dec-17 | | | | Jim Rogala |
| 2017FH4 | Complete Appendix B in 2018HNA1-Summarize methods used to develop flood inundation model | 30-Dec-17 | | | | Molly Van Appledorn |
| 2017FH5 | Complete Floodplain Areas Geodatabase | 30-Dec-17 | | | | Jason Rohweder, Tim Fox, and Molly Van Appledorn |
| 2017FFH3 | Complete Forest Succession Modelling work and Appendix D in 2018HNA1-Summarize methods used to develop forest simulation model | 30-Dec-17 | | | | Nathan De Jager |
| 2017GEO1 | Compile any remaining data used in HNA-II into geodatabase | 30-Dec-17 | | | | Tim Fox and Jason Rohweder |

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2018 Science in Support of Restoration and Management Scope of Work

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|---|---|----------------------|----------------------|----------------|----------|--|
| Assessing recent rates of sedimentation in the backwaters of Pools 4, 8, and 13 to support river restoration and the Habitat Needs Assessment-II | | | | | | |
| 2018ST1 | Reestablishment of horizontal and vertical temporary benchmarks, and a data base for horizontal and vertical benchmarks (Continuation of 2017ST1) | 30-Mar-18 | | | | Rogala, Moore, Kalas, Bierman |
| 2018ST2 | Open-water nearshore surveys completed and a database (Continuation of 2017ST2) | 31-Dec-18 | | | | Rogala, Moore, Kalas, Bierman |
| 2018ST3 | Over-ice surveys completed and a database (Continuation of 2017ST3) | 30-Mar-18 | | | | Rogala, Moore, Kalas, Bierman |
| 2018ST4 | Data analysis and completion report on sedimentation rates along transects (Continuation of 2017ST4) | 30-Sep-18 | | | | Rogala, Moore, Kalas, Bierman |
| Landscape Pattern Research and Application | | | | | | |
| 2018L1 | Draft Manuscript: Modelling Forest succession in the UMRS. | 30-Sep-18 | | | | De Jager |
| On-Going | | | | | | |
| 2016L3 | Draft Manuscript: Review of Landscape Ecology on the UMR | 30-Sep-18 | | | | De Jager |
| Intended for distribution | | | | | | |
| Manuscript: Swanson, W., De Jager, N.R., Strauss, E.A., Thomsen, M. In Review. Effects of flood inundation and invasion by <i>Phalaris arundinacea</i> on nitrogen cycling in an Upper Mississippi River floodplain forest. (2016L2) (Ecohydrology. 2017;10:e1877. https://doi.org/10.1002/eco.1877) | | | | | | |
| Manuscript: De Jager, N.R., Swanson, W., Hernandez, D.L., Reich, J., Erickson, R., Strauss, E.A. Effects of flood inundation, invasion by <i>Phalaris arundinacea</i> , and nitrogen deposition on extracellular enzyme activity in an Upper Mississippi River floodplain forest. (2015L5) | | | | | | |
| Manuscript: Van Appledorn, M., De Jager, N.R., Johnson, K. Considerations for improving floodplain research and management by integrating inundation modeling, ecosystem studies, and ecosystem services (2016L5) | | | | | | |
| Map Set: Reed Canarygrass abundance and distribution in the UMR (Pools 3-13) (2017L2) (Completed; LTRM Completion Report) | | | | | | |
| Manuscript: De Jager, Rohweder, Hoy. 2017. Mapping areas invaded by <i>Phalaris arundinacea</i> in Navigation Pools 2-13 of the UMRS. LTRM Completion Report (2016L4). | | | | | | |
| Eco-hydrologic Research | | | | | | |
| 2018EH01 | Draft manuscript describing inundation process zones across the UMRS | 30-Sep-18 | | | | Van Appledorn, De Jager, Rohweder |
| 2018EH02 | Inundation and Vegetation Data Analysis | 30-Sep-18 | | | | Van Appledorn, De Jager |
| 2018EH03 | Draft inundation model curation plan | 30-Sep-18 | | | | Van Appledorn, Fox, Rohweder, De Jager |

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2018 Science in Support of Restoration and Management Scope of Work

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|--|---|----------------------|----------------------|----------------|----------|--------------------------------------|
| Evaluation of a System-Wide Floodplain Inundation Model for Ecological Applications | | | | | | |
| 2017FH11 | Post-processing and analysis of logger data and water-edge mapping | 29-Dec-17 | | | | Van Appledorn |
| 2017FH12 | A written summary of validation results will be submitted as a supplement to the Habitat Needs Assessment II that identifies potential sources of UMRS inundation model error, discusses the validity of the model's assumptions, and provides guidance on appropriate model use. | 30-Sep-18 | | | | Van Appledorn |
| Aquatic Vegetation, Fisheries, and Water Quality Research | | | | | | |
| Aquatic Vegetation | | | | | | |
| 2015A7 | Data compilation and analysis: Aquatic macrophyte communities and their potential lag time in response to changes in physical and chemical variables | 30-Dec-17 | | | | Lund |
| 2015A8 | Draft completion report or manuscript: Aquatic macrophyte communities and their potential lag time response to changes in physical and chemical variables in the LTRM vegetation pools | 30-Jun-18 | | | | Lund |
| 2016A7 | Draft completion report: How many years did the effects of the 2001-2002 Pool 8 drawdown on arrowheads (<i>Sagittaria latifolia</i> and <i>S. rigida</i>) last? | 30-Sep-18 | | | | Yin |
| Fisheries | | | | | | |
| 2018B12 | Draft fish framework for research and applied management technical support in the Fish Component of the UMRR LTRM | 30-May-18 | | | | Ickes |
| 2018b13 | Coordination of draft fish framework with A-Team | 1-Aug-18 | | | | Ickes |
| 2018B14 | Final draft fish research framework | 30-Sep-18 | | | | Ickes |
| 2018B15 | Technical support for USACE | 30-Sep-18 | | | | Ickes |
| 2015B17 | Draft Manuscript: Fish Trajectory Analysis | 28-Oct-17 | | | | Ickes, Minchin |
| 2016B17 | Draft Manuscript: Developing and applying trajectory analysis methods for UMRR Status and Trends indicators – Year 2 | 28-Oct-17 | | | | Ickes, Minchin |
| 2016B14 | Draft completion report: Exploring Years with Low Total Catch of Fishes in Pool 26 | 30-Dec-17 | | | | Gittinger, Ratcliff, Lubinski, Chick |

Upper Mississippi River Restoration
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| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|---|---|----------------------|----------------------|----------------|----------|-----------------------------|
| Water Quality | | | | | | |
| 2015D16 | Draft manuscript: Trends in water quality and biota in segments of Pool 4, above and below Lake Pepin | 29-Dec-17 | | | | Burdis |
| 2018D12 | Draft White Paper on UMRR LTRM's interactions with programs for other large rivers, nationally and internationally | 30-Sep-18 | | | | Jankowski |
| 2018D13 | Using physical landscape metrics of hydrological connectivity to understand limnological conditions in backwaters of the Upper Mississippi River | 30-Sep-18 | | | | Jankowski, Rogala, Houser |
| Intended for Distribution | | | | | | |
| Manuscript: An Assessment of Long Term Changes in Fish Communities within Large Rivers of the United States (Environmental Monitoring journal) Counihan, Ickes, Casper, Sauer 2016B13 (Resubmitted to PLOS One) | | | | | | |
| Manuscript: Aquatic Plant Response to Large-Scale Island Construction in the Upper Mississippi River. Drake and Gray; 2016A6a. (Submitted to journal) | | | | | | |
| Statistical Evaluation | | | | | | |
| On-Going | | | | | | |
| 2016E2 | Draft manuscript: How well do trends in LTRM percent frequency of occurrence SAV statistics track trends in true occurrence? | 30-Sep-17 | | | | Gray |
| Intended for distribution | | | | | | |
| Draft manuscript: Inferring decreases in among- backwater heterogeneity in large rivers using among-backwater variation in limnological variables (2010E1) | | | | | | |
| Investigation of metabolism, nutrient processing, and fish community in floodplain water bodies of the Middle Mississippi River | | | | | | |
| 2017MMF2 | Draft report completed - will detail differences between the floodplain habitats and the main channel and associations between fish community and water quality attributes with connectivity of the water body to floodwaters or the main channel | 30-Dec-17 | | | | Sobotka |
| 2017MMF3 | Final Report | 30-Jun-18 | | | | Sobotka |
| Advancing our understanding of habitat requirements of fish assemblages using multi-species models | | | | | | |
| 2017FA1 | Draft LTRM Completion report on period-specific inferences on environmental gradients and species-environment associations by period | 15-Feb-18 | | | | Bouska, Gray |
| 2017FA2 | Final LTRM Completion Report | 15-Sep-18 | | | | Bouska, Gray |
| Mapping the thermal landscape of the Upper Mississippi River: A Pilot Study | | | | | | |
| 2017TL1 | Draft LTRM Completion report on feasibility and utility of surface water temperature map | 30-Dec-17 | | | | Jankowski, Robinson, Ruhser |
| 2017TL2 | Final LTRM Completion report and data distribution | 30-Mar-18 | | | | Jankowski, Robinson, Ruhser |

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2018 Science in Support of Restoration and Management Scope of Work

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|---|---|---|----------------------|----------------|----------|-----------------------------------|
| Estimating backwater sedimentation resulting from alluvial fan formation | | | | | | |
| 2017SED2 | Draft LTRM Completion report summarizing findings and providing recommendations for expanding the project system-wide | 31-Dec-17 | | | | Rogala, Hansen, Nelson |
| 2017SED3 | Final LTRM Completion Report | 30-Jun-18 | | | | Rogala, Hansen, Nelson |
| Pool 12 Overwintering HREP Adaptive Management Fisheries Response Monitoring | | | | | | |
| Fisheries Population Monitoring | | | | | | |
| 2018P13a | Collect annual increment of pool-wide electrofishing data | 1-Nov-17 | | | | Bierman and Bowler |
| 2018P13b | Collect annual increment of fyke netting data from backwater lakes | 15-Nov-17 | | | | Bierman and Bowler |
| 2018P13c | Perform otolith extraction from bluegills for aging | 1-Dec-17 | | | | Bierman and Bowler |
| 2018P13d | Age determination of bluegills collected in Fall 2014 | 1-Feb-18 | | | | Bierman and Bowler |
| 2018P13e | In-house project databases updated | 31-Mar-18 | | | | Bierman and Bowler |
| 2018P13f | Summary letter compiled and made available to program partners | 30-Sep-18 | | | | Bierman and Bowler |
| Pre-project Biological Response Monitoring; Crappie Telemetry –Kehough Lake | | | | | | |
| 2017AM5 | Summary letter Analysis of tracking data and quantification of 80% UD for Kehough lake | 30-Sep-18 | | | | Hansen, Bierman, Bowler, Theiling |
| Spatial Patterns of native mussels in the UMRS | | | | | | |
| 2016MRF2 | Final completions report: Spatial patterns of native mussels in the UMRS | 15-Nov-17 | | | | Ries, Newton, De Jager, Zigler |
| Pool 4 - Peterson Lake HREP Water Quality Monitoring – Pre and Post-Adaptive Management Evaluation | | | | | | |
| 2017PL3 | Collection of post-construction winter water quality data | February 2018 – 2019(?) Dependent on construction date | | | | Burdig, Moore, DeLain, Lund |
| 2017PL4 | Collection of post-construction summer water quality data | August 2018 – 2019(?) Dependent on construction date | | | | Burdig, Moore, DeLain, Lund |
| 2017PL5 | Summary letter: Tabular and graphical summary of water quality data | December 2018 - 2019 (?) Dependent on construction date | | | | Burdig, Moore |
| USACE UMRR LTRM Technical Support | | | | | | |
| 2018COE1 | Quarterly update submitted to the LTRM Management Team | 31-Dec-17 | | | | McCain, Cornish, Potter |
| 2018COE2 | Quarterly update submitted to the LTRM Management Team | 30-Mar-18 | | | | McCain, Cornish, Potter |
| 2018COE3 | Quarterly update submitted to the LTRM Management Team | 30-Jun-18 | | | | McCain, Cornish, Potter |

Upper Mississippi River Restoration
 Long Term Resource Monitoring Element
 FY2018 Science in Support of Restoration and Management Scope of Work

| Tracking number | Milestone | Original Target Date | Modified Target Date | Date Completed | Comments | Lead |
|--|--|----------------------|----------------------|----------------|----------|--|
| 2018COE4 | Quarterly update submitted to the LTRM Management Team | 30-Sep-18 | | | | McCain, Cornish, Potter |
| UMRR Science Coordination Meeting | | | | | | |
| 2018N1 | Science Planning Meeting | Winter 2018 | | | | Houser, Sauer, Hubbell, and Hagerty, all LTRM staff, UMRR Partners |
| A-Team and UMRR-CC Participation | | | | | | |

ATTACHMENT D

Additional Items

- **Future Meeting Schedule** *(D-1)*
- **Frequently Used Acronyms (10/20/2017)** *(D-2 to D-7)*
- **UMRR Authorization, As Amended (1/27/15)** *(D-8 to D-11)*
- **UMRR (EMP) Operating Approach (5/06)** *(D-12)*

**QUARTERLY MEETINGS
FUTURE MEETING SCHEDULE**

| | |
|-------------------------|---|
| FEBRUARY 2018 | |
| <u>Moline, Illinois</u> | |
| February 6 | UMRBA Quarterly Meeting |
| February 7 | UMRR Coordinating Committee Quarterly Meeting |

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|----------------------------|---|
| MAY 2018 | |
| <u>St. Louis, Missouri</u> | |
| May 15 | UMRBA Quarterly Meeting |
| May 16 | UMRR Coordinating Committee Quarterly Meeting |

Acronyms Frequently Used on the Upper Mississippi River System

| | |
|---------|---|
| AAR | After Action Report |
| A&E | Architecture and Engineering |
| ACRCC | Asian Carp Regional Coordinating Committee |
| AFB | Alternative Formulation Briefing |
| AHAG | Aquatic Habitat Appraisal Guide |
| AHRI | American Heritage Rivers Initiative |
| AIS | Aquatic Invasive Species |
| ALC | American Lands Conservancy |
| ALDU | Aquatic Life Designated Use(s) |
| AM | Adaptive Management |
| ANS | Aquatic Nuisance Species |
| AP | Advisory Panel |
| APE | Additional Program Element |
| ARRA | American Recovery and Reinvestment Act |
| ASA(CW) | Assistant Secretary of the Army for Civil Works |
| A-Team | Analysis Team |
| ATR | Agency Technical Review |
| AWI | America's Watershed Initiative |
| AWO | American Waterways Operators |
| AWQMN | Ambient Water Quality Monitoring Network |
| BA | Biological Assessment |
| BATIC | Build America Transportation Investment Center |
| 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 |
| 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 |
| HQSACE | 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 |
| 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 |
| 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 |

| | |
|---------|---|
| OHW | 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 |
| 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 |
| 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.] |
| 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 |
| WINN | 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), and Section 3177 of the Water Resources Development Act of 2007 (P.L. 110-114).

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 \$22,750,000 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 \$10,420,000 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.