Radisson Hotel
La Crosse, Wisconsin

Upper Mississippi River Restoration Program Coordinating Committee

Quarterly Meeting

August 9, 2016

Agenda

with
Background
and
Supporting Materials

Quarterly Meeting
Radisson Hotel
La Crosse, Wisconsin

UPPER MISSISSIPPI RIVER RESTORATION PROGRAM
COORDINATING COMMITTEE

August 9, 2016

AGENDA

12:30 – 2:00 p.m. Joint UMRBA – UMRR Coordinating Committee Meeting [See separate packet]

Time	Attachment	Topic	Presenter
2:30 p.m.		**Welcome and Introductions**	***Don Balch**, USACE*
2:35	**A1-16**	**Approval of Minutes of May 25, 2016 Meeting**	
2:40		**UMRR Fiscal Update**	***Marv Hubbell**, USACE*
	B1-5	▪ FY 2016 Fiscal Report ▪ FY 2017 Appropriations Status and Work Plan Development	
	B6-8	▪ FY 2018 Budget Guidelines and Anticipated Process	
3:00		**Habitat Restoration**	
		▪ District Reports	***District HREP Managers***
	C1-3	▪ September 27-29, 2016 UMRR Habitat Project Workshop – Objectives and Agenda Overview	***Marv Hubbell**, USACE*
		▪ Habitat Needs Assessment II (HNA II) – Outcomes of July 18-19, 2016 Steering Group Meeting – Anticipated Next Steps	
		▪ Continuous Process Improvements Related to Initial HREP Planning	
4:00		**Long Term Resource Monitoring**	
		▪ LTRMP Showcase: Improving Floodplain Research and Management by Integrating Inundation Models, Ecosystem Studies, and Ecosystem Service Assessments	***Molly Van Appledorn**, USGS*
	D1-13	▪ FY 2016 3rd Quarter Highlights	***Jeff Houser**, USGS*
		▪ A-Team Report	***Shawn Giblin**, WI DNR*
4:50		**Other Business**	
	E1	▪ Future Meeting Schedule	
5:00 p.m.		**Adjourn**	

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

ATTACHMENT A

Minutes of the May 25, 2016
UMRR Coordinating Committee Quarterly Meeting

(A-1 to A-16)

DRAFT
Minutes of the
Upper Mississippi River Restoration Program
Coordinating Committee

May 25, 2016
Quarterly Meeting

Hampton Inn
St. Louis, Missouri

Tim Yager of the U.S. Fish and Wildlife Service, on behalf of Sabrina Chandler, called the meeting to order at 8:00 a.m. on May 25, 2016. Other UMRR Coordinating Committee representatives present were Don Balch (USACE), Jeff Houser (USGS) on behalf of Mark Gaikowski, Dan Stephenson (IL DNR), Tim Hall (IA DNR) on behalf of Randy Shultz, Kevin Stauffer (MN DNR), Janet Sternburg (MO DoC), Jim Fischer (WI DNR), Ken Westlake (USEPA) via phone, and Marty Adkins (NRCS). A complete list of attendees follows these minutes.

Minutes of the February 24, 2016 Meeting

Jim Fischer moved and Kevin Stauffer seconded a motion to approve the draft minutes of the February 24, 2016 UMRR Coordinating Committee meeting as provided. The motion carried unanimously.

Regional Management and Partnership Collaboration

FY 2016 Fiscal Report

Marv Hubbell reviewed UMRR's FY 2016 internal allocations under the $21.174 million planning scenario, as below. This amount includes $1.387 million in additional funding that the Corps allocated to UMRR in its FY 2016 work plan. Hubbell said the additional funding was disbursed in each of the broach categories below: regional administration and programmatic efforts, regional science and monitoring, and habitat restoration.

- Regional Administration and Programmatic Efforts — $891,000
- Regional Science and Monitoring — $6,567,000
  - Long term resource monitoring — $4,500,000
  - Regional science in support of restoration — $963,000
  - Regional science staff support — $129,000
  - Habitat project evaluations — $975,000
- Habitat Restoration — $13,716,000
  - Regional project sequencing — $250,000
  - MVP — $3,631,000
  - MVR — $6,318,000
  - MVS — $3,515,000

[Note: The District habitat restoration funds are not reflective of the historical split based on river mileage, and instead are reflective of the project priorities as identified in the budget process.]

FY 2017 President's Budget

Hubbell said the President's FY 2017 budget request includes $20 million for UMRR, which is matched by the House Appropriations Committee and the Senate Appropriations Committee in their respective FY 2017 energy and water appropriations measures. In addition, the House Appropriations Committee included $25 million in additional FY 2017 funding in the Corps' construction account for ecosystem restoration or compliance programs and projects. The Senate Appropriations Committee included $40 million in FY 2017 funding for that line item. UMRR is eligible to receive the additional ecosystem restoration or compliance funding through a competitive process per the Corps' work plan allocations.

FY 2018 President's Budget

Hubbell reported that District staff are developing capability reports for the FY 2018 budget.

UMRR's "30 Years of Service" Commemoration

Hubbell said UMRR's 30 years of service commemoration is scheduled for August 8, 2016 in late afternoon or early evening. Holding the event later in the day alleviates scheduling conflicts for Corps staff and agency leaders involved with the Mississippi River Commission's low water inspection tour, and facilitates public participation in the event. An *ad hoc* interagency team is currently developing an agenda and key messages and securing logistics.

Hubbell mentioned that Corps staff have been deliberating about the appropriate name for the event that is not too boastful about its longevity but that showcases UMRR's many successful achievements over its first 30 years and its relevance in making the UMRS a healthier and more resilient ecosystem.

2016 UMRR Report to Congress

Kirsten Mickelsen thanked many UMRR partners for their contributions to the report's content and writing, as well as photos and other images. Mickelsen reflected that the report represents the breadth and depth of the program's many aspects and its contributions to the region and nation.

Mickelsen reported that the second partnership review of the 2016 UMRR Report to Congress (RTC) was employed between March 14 and April 16, and a request for a third, final review was emailed from Margie Daniels on May 16. Comments from the May 16 review draft are due on June 10. Simultaneously, a formal Corps review is ongoing and comments are requested by June 30. Should any major comments be received, a partnership conference call will be convened in July. She said the only major modification in the third draft report is the executive summary. Instead of a traditional executive summary format, it pulls out the most important key messages of UMRR's successful implementation and makes the case for the program's relevance well into the future. Mickelsen said that the anticipated publication schedule is to incorporate professional graphics from July to September 15, submit an electronic reviews draft to Corps leadership on September 15, and ground mail hard copies to MVR on November 1 for wider distribution. She acknowledged that this is an incredibly tight timeline.

Mickelsen explained that the report provides a great deal of detailed information about UMRR's implementation in order to ensure transparency and accountability for all of the efforts that the program funds. Given that many readers will simply skim through the report, Mickelsen said she is working with program partners to provide short sound bites associated with pictures, figures, and tables. She showed a couple of examples.

In response to a question from Jim Fischer, Mickelsen explained that District staff are seeking Headquarters' and Division's input on the policy recommendations including the UMRR/NESP Transition Plan. Fischer cautioned against any statement that may indicate dissatisfaction with UMRR.

UMRR Database

Hubbell reported that District staff published new, recalibrated maps of UMRR's completed habitat project boundaries as well as a white paper that provides mapping guidelines and methodologies for defining project boundaries. The white paper and new, recalibrated maps are available at http://www.mvr.usace.army.mil/Missions/EnvironmentalProtectionandRestoration/UpperMississippiRiverRestoration/HabitatRestoration/FindanHREPProject.aspx. Two web-based conference calls are scheduled to facilitate an interactive review of the redefined boundaries and guidelines, and to ask questions regarding the boundary data and white paper. Marked-up PDFs and other comments can also be submitted to Marv Hubbell (marvin.e.hubbell@usace.army.mil) or Michael Dougherty (michael.p.dougherty@usace.mil.usace). The webinar dates and call-in information is as follows:

- Dates: June 8 and 15 at 10 a.m.
- Call-in details:
  - Web-connection: https://www.webmeeting.att.com
    Access code: 3926936
  - Phone connection: 877-873-8018
    Access code: 3926936
    Security code: 1111

Hubbell confirmed that the redrawn boundaries have resulted in relatively little change in the total number of acres restored that the Corps has been reporting for UMRR. Ken Westlake asked if changes in the river's geomorphology over time have affected the boundaries and acreage totals. Hubbell and Tim Eagan explained that the mapped boundaries surround the planning area described in the feasibility report. That area extends beyond the project features and therefore has a stable footprint. In response to a question from Fischer, Hubbell said examining the project's area of influence may be a future endeavor for the program. This is a first step to obtaining consistency among UMRR habitat projects' reported acreages benefited. Defining the criteria and process for determining and evaluating the area of influence will require careful consideration. For example, the answer will vary significantly if targeting certain fish or wildlife species. Fischer suggested that standardizing project goals and objectives among floodplain reaches would allow for comparing and adding such acreage totals in the future.

In response to a question from Janet Sternburg, Hubbell said the database is not yet accessible to partners. District staff have been focused on inputting the data first and then will explore external accessibility capabilities. However, Hubbell urged partners to contact him with any information requests utilizing the database. In response to Sternburg's comment that partners may not be fully aware of the available information, Karen Hagerty suggested that District staff host a webinar on the database's capabilities. Sternburg supported Hagerty's suggestion.

External Communications and Outreach

Final Logo Design and Tagline

Angie Freyermuth reported that graphics for the new UMRR logo are finalized with the slight modifications to the design as requested by the UMRR Coordinating Committee at its February 24, 2016 quarterly meeting. Freyermuth said she sent a May 3, 2016 email to the Coordinating Committee, A-Team, field station leads, and key Corps staff with high resolution images of the logo in various file formats as well as guidelines for using the logo. She requested that the new logo is used going forward on all UMRR-related publications and outreach material using the standardized protocols. Consistent use of the logo is important for brand recognition and valuation.

Communications Team

Freyermuth requested that, by May 30, partners send her 1) any relevant, captivating pictures to include in an accomplishments book that would showcase UMRR's successes over its first 30 years, and 2) names of interested individuals to serve on the UMRR Communications Team. In FY 2017, ideas for improving UMRR's communications and outreach include redesigning and revamping UMRR presentations, updating signage at habitat project sites and field stations, establishing a virtual recreational trail(s) with informational material about UMRR, and launching a UMRR quarterly newsletter.

Marty Adkins emphasized the need to engage land owners in the watershed whose management of private lands affect nutrient loading into the UMRS and its ecological health. It is important to communicate to the public in the watershed about their direct connection to the UMRS ecosystem, as well as the value of the UMRS as a transportation corridor and for economic development. Adkins responded to a question from Hubbell about how best to engage watershed stakeholders by suggesting that conversations with interested public occur deliberately and outside of UMRR quarterly meetings.

In response to a question from Janet Sternburg, Freyermuth said the accomplishments book is pulling a mixture of higher-level and micro-level achievements that are described in the 2016 UMRR RTC. Sternburg asked Freyermuth if she was seeking information from UMRR engineers about how the program's restoration techniques are now being used across the country. Jeff Houser said that many individuals outside of the program are impressed with the flow of long term monitoring and other science information among all agencies working on the UMRS. Houser said this information flow was a recognized need in the 1982 UMRS Master Plan.

Jim Fischer said the Mississippi River Parkway Commission could be a great resource for developing the recreational trail. In addition, Fischer said LTRMP field stations often receive questions from the public at boat landings. He suggested that the communications team consider creating generic business cards with key informational resources for passing out when interacting with the public. Ken Westlake suggested adding UMRR signage at marinas, boat landings, overlooks, and other recreational areas. In response to a question from Tim Yager, Freyermuth clarified that the recreation trail would be a virtual, interactive map that highlighted access points and habitat projects. Once that is developed, UMRR may consider developing water and hiking trails for the public to explore.

In response to a question from Brian Johnson, Freyermuth said that the *Our Mississippi* is published three times a year. The summer edition will feature UMRR's "30 years of service" celebration. Freyermuth explained that a UMRR quarterly newsletter would be a supplement to *Our Mississippi* and would be used for Congressional visits and other outreach. She added that *Our Mississippi* does not always feature UMRR.

Hubbell reported that Col. Craig Baumgartner, MVR's Commander, directed Freyermuth to spend a significant amount of time on UMRR outreach. It is a tremendous opportunity for the program to utilize her expertise. Hubbell expressed appreciation to Freyermuth for her work on this effort.

Dru Buntin recalled Hubbell's explanation that, in light of the FY 2017 budget discussions, there has been concern from some Corps leadership about how a celebration recognizing UMRR's existence for 30 years might be perceived. Buntin discussed the challenges in creating messages of UMRR's importance and significance while maintaining a low profile. In developing the 2015-2025 UMRR Strategic Plan, partners talked extensively about the need to better communicate UMRR's achievements in order to show the program's national relevance. Buntin emphasized that, while he understands the concerns about highlighting the fact that UMRR has been funded for 30 years, failing to aggressively highlight the great work accomplished by the partnership through UMRR would risk the program's future funding given the extremely competitive nature of limited national ecosystem restoration dollars.

There has been a lot of groundbreaking work, research, as well as a great deal of in-kind contributions from program partner organizations that have resulted in UMRR's accomplishments, and given the increasing competition for limited resources, UMRR will need to pursue a robust, integrated communications strategy in order to remain competitive. Buntin explained that, while he understands that some of this concern is related to the conflicting timing with the Mississippi River Commission's low water inspection tour, it was Corps staff that had recommended holding the UMRR's 30th anniversary event in conjunction with the tour during discussion at the November 17, 2015 breakfast meeting with the UMRBA Board. Buntin suggested that these kinds of challenges are the types of issues that the communications team could help address.

Sternburg added that existing ecological challenges and UMRR's ability to address them also needs to be communicated. Partners need to be prepared to answer questions such as "when will UMRR be done?" Hubbell agreed and said UMRR's monitoring and science information will help answer that question. Hubbell mentioned that John Anfinson will provide that foundation in his remarks at the program's August 8, 2016 30th anniversary event. Hubbell emphasized that a major science restoration program on a large river ecosystem is a major undertaking and it is important to continue for the purposes of integrated management of the river to support multiple uses. Adkins suggested communicating about UMRR in ways that will energize targeted audiences by telling them how UMRR helps to advance their respective goals.

America's Watershed Initiative 2016 Raise the Grade Conference

Hubbell said the Mississippi River Conference is scheduled to meet in the Quad Cities on October 13-14, 2016. A focus of the meeting will be on the metrics used in the America's Watershed Initiative's (AWI's) Raise the Grade Report Card. District staff plan to encourage the use of UMRR's tremendous amount of long term monitoring data and other information to develop key messages that more accurately reflect the current ecological state on the UMR and UMRR's role in "raising the grade.

In response to a question from Janet Sternburg, Buntin said TNC is hosting the event and UMRBA is on the AWI's Steering Committee and will be helping to plan the event. Olivia Dorothy said the Report Card has many shortcomings. In particular, the metrics used do not accurately reflect the condition on the river but were chosen because they might have the information available in all the subwatersheds. Dorothy indicated that she will be submitting comments on the Report Card and is willing to share them before the October event. Brad Walker said he has also followed the Report Card's development since the beginning and has provided comments.

Public Outreach and Engagement

Tim Yager reported that a dedication of Capoli Slough was held on May 13, 2016 and was attended by 40-50 local public, including a large school group. The event was publicized in *Dredging Today*. Yager said the article attracted national attention at the USFWS's Headquarters office.

Long Term Resource Monitoring and Science

FY 2016 2nd Quarter Highlights

Jeff Houser reported that accomplishments of the second quarter of FY 2016 include:

- Publication of 1) a fact sheet of UMRS landscape ecology and 2) a trend analysis methods development report.
- Serving all of the 2015 long term resource monitoring data on USGS's UMRR web site.
- A statistics class held at UMESC on April 12-14, 2016, which was attended by 14 partners.

Houser explained that the fact sheet describes UMRR's research on landscape ecological research, including indicators used to inform regional restoration priorities and how connecting landscape patterns with ecological processes allows for predicting the likely effects of restoration. The research is generating valuable information about the spatial arrangement of various land cover and habitat types, such as the diversity of aquatic areas. Another example is using the landscape pattern research to inform where flooding conditions could support various floodplain plant communities. Houser noted that the report regarding trend analysis methods found that relatively simple linear regression and state-space random walk models performed best for estimating multi-year temporal trends for LTRMP fish (catch per unit effort) and aquatic vegetation (occurrence).

In response to a question from Jim Fischer, Houser said that USGS is nearly finished with reworking the Java script for the long term resource monitoring data. Houser said it is sometimes a big effort to keep up with evolving technologies. Jennie Sauer added that the anticipated dates for completing the Java script updates are provided in the milestones chart that is included in the agenda packet.

In response to a question from Marv Hubbell, Houser said the 2015 monitoring data showed high turbidity in the lower floodplain reaches and that vegetation continues to do well. He explained that hydrology seemed to drive the difference in turbidity among the upper and lower floodplain reaches.

Marty Adkins asked if the tree diversity index is being used to define the optimal vegetation conditions on habitat projects. Nate De Jager said that involves a complex answer and that he would follow up with Adkins. Karen Hagerty mentioned that Corps foresters use the index to target higher elevations for forest restoration. In response to a question from Ken Westlake, De Jager said the flood inundation model is used to determine the areas that will experience certain flood durations and to identify the appropriate vegetation species that will survive in those conditions. Tim Yager mentioned that the UMRS water level management task force is considering opportunities to implement drawdowns in order to reduce the flood inundation time period during the growing season.

USACE Science Update

Hagerty said the total funding available for science in FY 2016 is $5.463 million, including $312,774 in FY 2014 and FY 2015 carry-over mostly due to unfilled vacancies. Hagerty said that $5.463 million is allocated in the FY 2016 SOWs, with $4.5 million for long term resource monitoring and 963,000 for analysis under base funding. With $180,745 remaining, the UMRR LTRMP management team agreed to allocate $28,386 to continued telemetry work to support the Pool 12 Overwintering habitat project's adaptive management analysis and $52,000 for Corps staff participation in the ecological resilience effort. That left $100,359 in available money for science analyses in support of restoration. Hagerty recalled the discussion at the February 24, 2016 quarterly meeting and reported that, via email correspondence following that meeting, the UMRR Coordinating Committee endorsed a proposal by the LTRM Management Team to allocate the remaining $33,130 FY 2015 carry-over money to Wisconsin DNR for evaluating biological shifts due to invasion by curly-leaf pondweed.

Hubbell said UMRR also funded the ecological resilience work, the HNA II, and other science research. Hagerty added that the landscape research was also funded in FY 2016.

A-Team Report

Shawn Giblin reported that the April 27, 2016 A-Team meeting included a series of connectivity-related presentations, including fish indicators of ecosystem health, hydraulic connectivity engineering and hydraulics perspectives, USFWS National Wildlife Refuge System's O&M for hydraulic connectivity, how hydraulic connectivity drives water quality and habitat outcomes from both a northern and southern perspective. Giblin overviewed each of the presentations and observed that the A-Team meetings

provide a great opportunity for engineers and biologists to discuss ideas and to synthesize information that is being learned. The A-Team meetings also provide important opportunities to showcase progress that has been made in understanding the effects of various levels of connectivity and to show how these concepts can, and have been, applied to UMRR habitat projects. Giblin said the next A-Team meeting will focus on water depths.

Hagerty said she has received very positive feedback on the A-Team meeting from District staff. The themed approach to the presentations was very effective. Fischer expressed appreciation to Giblin for his leadership of the A-Team. Barb Kleiss said that similar research is being conducted on the Lower Mississippi River to better understand connectivity, and suggested that there are opportunities to coordinate. Kirsten Mickelsen noted that Giblin provided several important points that would be helpful for communication efforts and suggested that certain soundbites of learned information be shared in a common place so that they are easy to find and use.

Developing Ecological Resilience Conceptual Models

Houser provided an overview of UMRR's effort to-date to define and apply the concepts of ecological resilience to the UMRS. He recalled that the 2015-2025 UMRR Strategic Plan called for UMRR's habitat projects to address ecological resilience and for an increased understanding of the status and trends of the UMRS's ecological resilience. Houser said USGS hired Kristen Bouska in fall 2015 to assist with the resilience effort. He discussed USGS's work thus far to engage UMRR partners in defining conceptual models of lentic, lotic, and floodplain forest subsystems within the UMRS ecosystem:

- Resilience work group meeting in fall 2015
- Informal questionnaire to UMRR partners winter 2015-2016
- Facilitated workshop in January 2016
- UMRR LTRM Science Meeting in February 2016
- UMRCC in Spring 2016

Houser listed the participants involved in the resilience working group including Dave Bierman (Iowa DNR); Dave Herzog (Missouri DoC); Kristen Bouska, Nate De Jager, and Jeff Houser (USGS); Andy Casper (Illinois Natural History Survey); Kirsten Mickelsen (UMRBA); Bob Clevenstine, Sara Schmuecker, and Steve Winter (USFWS); Jon Hendrickson, Marv Hubbell, and Nate Richards (USACE); Shawn Giblin (Wisconsin DNR), In addition, the following individuals participated in the January 2016 workshop: Kevin Stauffer (Minnesota DNR); Dru Buntin (UMRBA); Melinda Knutson (USFWS); Brian Ickes, Jim Rogala, and Yao Yin (USGS); Lance Gunderson (Emory University); and Allyson Quinlan (Resilience Alliance).

Houser explained the definition of resilience as "capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks." Main concepts of ecological resilience are:

- Small changes in controlling variables can lead to rapid changes in major ecosystem services to rapid changes in major ecosystem services when the system is near a threshold
- There are multiple possible states, instead of one global equilibrium to which an ecosystem can always return.
- There exists nonlinearity (hysteresis), meaning that an ecosystem cannot always return to its original state.

- Controlling variables and other components of the ecosystem can interact resulting in positive or negative feedbacks – e.g., a positive relationship exists between sedimentation and submersed aquatic vegetation.
- Slow variables, such as sedimentation, play a key role.

Houser explained that resilience is value neutral and must be placed in context. Strong resilience can either maintain a healthy ecosystem or an unhealthy ecosystem in the face of disturbances. On the other hand, low resilience could either shift a healthy ecosystem to an undesirable state or vice versa. For example, the return of a high presence aquatic vegetation in the northern reaches of the UMRS suggests that it vegetation is resilient to stressors. However, in the southern reaches, the vegetation seems to have difficulty reestablishing and therefore the vegetation is either not resilient or it may be resilient to its poor state. Houser said changes in ecological states can occur gradually in a relatively linear fashion, quickly at some threshold point, or hysteresis where an ecosystem cannot simply return back to its original state.

Houser said the workbook, *The Resilience, Adaptation and Transformation Assessment Framework: From Theory to Application*, is being used as a guide to applying ecosystem resilience concepts to the UMRS. The workbook contains three main sections: system description, assessing the system, and adaptive governance and management. Thus far, USGS has lead partners through the first main section, which includes defining the scope, scale, and a "desirable" future condition, the resilience of what to what, the governance and social interactions, and how the ecosystem functions.

Houser said the purpose of doing the ecological resilience assessment is to 1) improve the understanding of the UMRS's current ecosystem resilience and the potential for management and restoration actions to affect the resilience of the UMRS, 2) identify potential indicators of ecosystem resilience, and 3) identify areas of uncertainty where additional study is needed to inform management and restoration. UMRR partners agreed to define the UMRS ecosystem as the main stem river and floodplain, with larger scale processes included as external drivers. The analyses will focus at the floodplain reach scale, given the significant differences in ecosystem condition throughout the UMRS. In addition, the analyses will focus on three main ecological systems:

1) Lentic: backwater lakes and impounded areas
2) Lotic: channels (main and side channels)
3) Floodplain (with emphasis on forests)

Houser said the workshop and survey were used to define the major issues affecting the system. Houser listed all of the identified issues. They ranged among altered hydrology, habitat loss and deterioration, sedimentation, impaired recreational access, altered hydrologic connectivity, and so forth.

Houser said the next step is to define a basic relationship of the valued ecological component to its stressor – i.e., the resilience of what to what. This requires determining the critical ecological components of the system and what are the likely shocks/disturbances that the ecosystem will continue to experience. To answer the question of "resilience of what," the resilience work group identified the valued uses or ecosystem services that are provided by the UMRS (e.g., recreation, water quality) and the ecological components that support those uses or services. Houser showed the timeline that Kristen Bouska developed to visualize the historical pattern of disturbances that have affected the UMRS ecosystem, including eras associated with settlement and opening, navigation and floodplain development, and multi-use management.

Houser explained that the resilience work group then examined the main controlling variables and interactions among them that essentially make the ecosystem function, as well as the interactions across and within scales and feedbacks. USGS staff then synthesized that information into conceptual models

for each of the three sub-ecosystem classifications: lotic, lentic, and floodplain. Houser explained that USGS staff are working with UMRR partners to determine what we know about the relationships between components required to support expected uses and services and the key controlling variables, as well as what we do not know and need to research. The models will also be used to determine past and potential impacts of ecosystem management and restoration of the river.

Houser explained the conceptual model of lentic backwaters, showing how the external drivers, controlling variables, and aggregate factors interact with each other and affect the major uses and services. USGS staff are developing tables to identify the quantifying thresholds between the key controlling variables and major uses and services as well as the associated scientific research. Houser said the models reflect the notion that the resilience of the UMRS ecosystem is dependent on individual and cumulative relationships among various stressors and disturbances and the valued ecological components that they influence.

Houser said the resilience work group will begin working on the second section of the resilience workbook – i.e., assessing the system. This will include assessing alternate regimes (states) of the ecosystem, such as high turbidity and scarce aquatic vegetation versus clear water and abundance aquatic vegetation. The assessment will lead to answers about *specific* resilience (resilience of particular parts of a system to identified disturbances) and *general* resilience (the capacity of the ecosystem to cope with unfamiliar shocks and surprises). The conceptual models form the basis for determining specific resilience. Houser said that the principles for building resilience include maintain diversity and redundancy, manage connectivity, and manage slow variables and feedbacks, and described how UMRR's habitat projects contribute to those principles.

Houser said next steps include populating the models and tables with information, refining the conceptual model diagrams, publishing the system assessment effort to-date and analyzing existing data to better quantify and understand the relationships identified in the conceptual models. Ultimately, the goal is to describe the impacts of UMRR's restoration and management of the ecosystem. Houser said UMRR's long term monitoring data will be the primary reference for quantifying the relationships. The expected outcomes of this work are to assess the current state and trends of the UMRS's ecosystem, including trends in controlling variables, proximity to thresholds of concern, developing indicators of resilience, determining where the system is acceptable and resilience should be enhanced to maintain the state and where the system is unacceptable and resilience should be reduced.

Janet Sternburg expressed her appreciation for Houser's presentation and all of the work put into developing the conceptual models. There has been a lot of progress in a relatively short timeframe and indicated her support for its progress. Jim Fischer echoed Sternburg's sentiment and said he is very impressed with the effort to date. Megan Moore applauded the resilience work group's efforts and said the conceptual models provide a great communications tool for connecting what has been learned, the restoration work to improve the river's condition, and what remains to be done. Houser agreed that the conceptual models can serve as a framework for communication and an important way for examining the long term monitoring data. He added that the A-Team's efforts to pull together interactive conversations about the learned information of external drivers and controlling factors is very useful and fits well into this work. Marty Adkins said he learned a lot from Houser's presentation. This could serve as an important connection to the watershed. Integrating UMRR's work to watershed programs and projects will require a concerted effort.

Marv Hubbell said Houser, USGS staff, and others participating on the work group have done an excellent job putting this all together. According to Hubbell, this work is very important to reexamining where UMRR is headed and having the information available to be accountable and transparent about the successes of habitat projects. It also serves as a powerful example of using science to frame where we need to go with habitat restoration. Houser also expressed appreciation to Kristen Bouska who has done a large amount of the work on the timeline and synthesizing the information as well as to the

partners who have providing input and participated in the effort. Ken Westlake said Houser provided a great presentation and remarked about the tremendous work of putting complex information into an understandable framework.

Habitat Restoration

District Reports

St. Paul District

Chris Erickson reported that MVP transferred $1.5 million to MVR to advance Pool 12 Overwintering construction, and anticipates using the repayment next year for awarding North and Sturgeon Lakes. The District also anticipates completing Harper's Slough next year. The contractor indicates that construction should be completed in two years rather than the three years originally scheduled. Erickson also summarized the public outreach events associated with the Capoli Slough dedication, including STEM-related activities with local elementary schools.

Rock Island District

Hubbell reported that MVR's FY 2016 planning priorities are Keithsburg and Beaver Island, which is scheduled for completion this fiscal year and a construction start anticipated for FY 2018. MVR will start planning for Delair in FY 2017. Delair is replacing Boston Bay in response to USFWS's preference. Huron Island's design is nearly complete and the project will soon be advertised for a contact bid. Rice Lake was damaged in the summer 2015 flood and repairs should be completed by September 1. Hubbell said that District staff are working to complete three project evaluation reports.

In response to a question from Dru Buntin, Hubbell explained that the Delair project was selected by the District teams and the system ecological team and endorsed by the UMRR Coordinating Committee a few years ago.

St. Louis District

Brian Markert said MVS is advancing planning on Piasa and Eagles Nest Islands and Harlow and Open River Islands. Evaluation reports for Stag Islands and Pharrs Islands are nearly complete. MVS anticipates awarding a construction contract for Clarence Cannon in September 2016, and closing out construction on Pools 25 and 25 this fiscal year. Ted Shanks involved the primary construction effort for MVS in FY 2016.

Rip Rap Landing

Brian Market emphasized that the St. Louis District enjoys great working relationships with a diverse set of stakeholders, allowing for implementation of important water resource projects that maintain the principles of integrated, multi-purpose management of the UMRS. Markert showed an 1890 map of the Rip Rap Landing habitat project location and the original Sny Levee District, which is located on the northern portion of the project site. He explained that the area is important for migratory birds, fish spawning and rearing, wildlife habitat, and the continued support of environmental services and uses. However, it has faced many degrading stressors including sedimentation and high nutrient loads, altered hydrology, major flooding, reduced floodplain connectivity and channel constriction from levees, invasive species, lack of forest diversity and hard mast trees, and limited infrastructure to support water level management of the backwaters.

Markert described the selected plan for Rip Rap Landing and how restoration features in the each of the five zones within the project site address important resource issues. Total estimated project cost is

$9 million. However, the restoration of Dog Island will be funded at full federal expense, reducing the costs in the cost share agreement with Illinois by $1.133 million to $6.250 million. Illinois is contributing $2.886 million in LERRDs credits (lands, easements, rights-of-way, relocation of utilities or other existing structures, and disposal areas). The value of these lands was estimated by the Corps but may be higher given the recent demand for hunting lands in west central Illinois. Market said the estimated average annualized cost for OMRR&R is $62,098.

Markert reported that, while the draft feasibility study is complete, the Corps and NRCS are still considering legal issues under the existing wetland reserve program (WRP) easement that exists on a portion of the project site. He compared the purposes of the WRP easement on the project site with the Rip Rap Landing's habitat project goals, noting that they are complementary and work towards the same goals of increasing the quality and quantity of fish and wildlife habitat and improving water quality and water level management.

Markert explained that the Corps is working with Illinois DNR and NRCS to determine whether there are opportunities to work within the WRP requirements to show that the appropriate real estate interest has been acquired. All lands must be acquired either by the non-federal sponsor or through fee title. Corps policy (WR 405-1-12) also seems to allow for "a lesser, or easement estate" given the OMRR&R needs. Markert said NRCS typically requests a detailed project design in order to evaluate and issue a compatible use authorization (CUA), but the Corps' draft feasibility report does not provide sufficient detail for a CUA determination. In the interim, NRCS has issued a letter of support for the Rip Rap Landing feasibility report and has suggested continued involvement and development of planning and specs for the project. The Corps has expressed issues with the option of using a CUA because it is five year time limit and is revocable. There are no assurances that the CUA will be maintained throughout the project design life of 50 years.

Markert recalled that planning on Rip Rap Landing was initiated in 2009, and from 2011 to 2013, the Corps worked with partners to complete an independent technical review (ITR), in-progress review (IPR), alternative formulation briefing (AFB), as well as to incorporate District and Division leadership comments and revisions. In addition, Corps Headquarters issued a waiver allowing Rip Rap Landing to proceed to construction even though its land acquisition exceeds USACE's policy threshold limiting land acquisition to no more than 25 percent of the project's total cost. In 2014, the Corps completed an agency technical review (ATR) for the project and revised the draft feasibility report to incorporate District and Division comments. MVS submitted the revised report to Division in August 2015 for its approval. Between November 2015 and April 2016, Division expressed concern with the NRCS option for using a CUA on the easement because of the time limit and the provision that allows NRCS to revoke the agreement. Over that time, there have been many discussions among Corps and NRCS leadership and legal staff. Markert said the Northwestern Division (NWD) provides an example agreement where the Missouri River Recovery Program (MRRP) was able to move forward with a restoration project involving lands with a WRP easement. Markert said the next steps in the project development phase include approval of the feasibility report, non-federal appraisal of real estate, execution of the project partnership agreement (PPA), design of project features, and construction. There are three possible options for addressing the real estate concerns:

1) Work with Illinoi state-level NRCS and Illinois DNR to develop alternative language for a CUA
2) Request a waiver from Headquarters
3) Reformulate the feasibility report

Markert said the Corps has suggested modifying the CUA to include statements that 1) offer a perpetual easement to maintain the project features and 2) allow for inspection and ample time to "cure" issues, rather than the current language allowing for "termination at will." An MOA may be another option that would accompany the CUA. According to Markert, said there is a long history of partnership

among MVS, NRCS, and Illinois and strong stakeholders support for the project. The easement covers only a third of the project site. Markert welcomed any suggestions for resolving the issues, including reaching out to other Divisions and Districts for their experiences in working through similar issues.

In response to a question from Marty Adkins, Markert said USFWS and NRCS agreements are inherently different because they are viewed as a title merger between federal agencies. In the case of Rip Rap Landing, it involves a transfer between state and federal interests. Don Balch said the Division has been consulting the NWD and Corps attorneys to find a workable solution. It will likely need to be resolved at the Corps and NRCS senior executive levels. Another possible solution might be a permit among the federal agencies. Harold Deckard explained that there are fundamental differences between the Rip Rap Landing project and the MRRP project in the NWD, including with reconnecting the floodplain and constructing additional structures. Deckard said he believes the issues will get resolved by the agencies' leadership.

Olivia Dorothy asked Markert to elaborate on the ecological issues to Rip Rap Landing associated with the Sny Levee. Markert said that the ecological challenges to the site are the result of channel constriction from multiple levees upriver as they cumulatively force water downriver more quickly and have resulted in higher sedimentation than would have occurred historically when the river floodplain was connected. Don Balch mentioned that the Corps had a meeting with the Mississippi River Commission (MRC) regarding the Sny Levee on Monday, May 23, 2016. In response to a question from Robert Stout, Balch said flood control on the UMRS is not within MRC's authority. But the MRC has indicated potential interest in collaborating to determine a solution. Monique Savage clarified that feasibility planning assumes that existing structures (e.g., levees) remain in place.

Habitat Project Workshop

Hubbell said an HREP workshop is scheduled for September 27-29, 2016 in Davenport. Workshop objectives include building relationships and facilitating dialogue, discussing insights gained, and strengthening UMRR's restoration efforts. The objectives and an outline of the working draft agenda are included on page E-1 of the agenda packet. The workshop is being co-chaired by the Corps and USFWS, with Kara Mitvalsky and Sharonne Baylor as the lead points of contact.

Janet Sternburg suggested adding an agenda item regarding what is involved in sponsoring a habitat project. Sternburg said it is important to understand the expectations upfront especially as UMRR begins identifying the next generation of projects. Dru Buntin suggested having a special meeting devoted to the challenges for non-federal cost-share sponsors and begin to address these issues before initiating the identification and selection of the next generation of projects.

In response to a request from Jim Fischer, Kirsten Mickelsen explained that the current working draft agenda is an annotated format. Mickelsen said she will work with Mitvalsky and Baylor to provide a more complete draft agenda with a request for input in a save-the-date email to the UMRR distribution list. Fischer requested having a session devoted to using UMRR's long term resource monitoring protocols in habitat project planning and evaluation. Mickelsen said this is included in the current agenda and will include breakout sessions for participants to discuss what we need to be monitoring and why, with the follow-up question of how best to monitor for those identified needs. In response to a question from Houser, Mickelsen said she understands that the UMRR Coordinating Committee state members sent the initial workshop notification to the field stations. Some field station staff have already indicated that they plan to attend. In response to a question from Sternburg, Hubbell said he will look into providing travel support for state agency participants.

Lean Six Sigma

Hubbell recalled that the idea to employ a continuous process improvement evaluation using Lean Six Sigma techniques evolved out of the 2013 UMRR Implementation Issues Assessment and the 2014 UMRR Agency Leadership Summit. It was in response to tighten state budgets during a major recession, while at the same time, the federal government was investing heavily into construction projects that required states' review and permitting. The UMRR Coordinating Committee has had subsequent discussions about the focus and scope of a Lean Six Sigma evaluation and elected to focus on four stages of habitat project planning: initial feasibility planning, evaluation of the existing ecological condition, plan formulation, and the draft environmental assessment report. These stages are where sponsor has the most engagement. Hubbell illustrated the many activities involved in the plan formulation and environmental assessment/NEPA compliance stages.

Hubbell said UMRR has become significantly more efficient at project planning and are completing feasibility studies in less time and at less expense that the Corps SMART planning requirements. Hubbell said he believes that Huron Island habitat project was a turning point. In to past discussions from project sponsors, Hubbell provided an overview of where project sponsors are involved in the plan formulation and environmental assessment/NEPA compliance stages. Hubbell said that an interagency project development team (PDT) is established once a project fact sheet is approved. That fact sheet includes goals and objectives for the project that provide a framework for planning and design. The PDTs are involved in planning decisions throughout the feasibility study, but is limited during design and construction. Hubbell said he anticipates that the UMRR Coordinating Committee will continue having these discussions and suggested that some of these issues be discussed in the September 27-29, 2016 UMRR HREP Workshop.

In response to a question from Buntin, Hubbell said he is seeking input on which activities to explore in a continuous process improvement evaluation. Robert Stout acknowledged that feasibility studies involve a lot of work and deliberation and that it would be beneficial to find ways to make them easier to navigate. Stout said the Senate Energy and Public Works (EPW) Committee's draft 2016 WRDA measure has language allowing the Corps to pay the first $1,000 of a feasibility study. Stout said this would be very beneficial to obtaining stakeholder support and doing some of the initial groundwork. Sternburg recalled that a reason for requesting a continuous process improvement evaluation was to eliminate inefficiencies and redundancies in decision making. Mickelsen noted that the UMRR Coordinating Committee had requested that the Corps provide the milestones at which stakeholders and project sponsors are engaged and make decisions. This would then inform where to focus Lean Six Sigma. Savage noted that communication could be improved and is very important for an efficient and smooth planning process. Chris Erickson advised the UMRR Coordinating Committee to consider the trade-offs associated with a Lean Six Sigma evaluation, given the significant time and fiscal resources required.

In response to a suggestion from Buntin, the UMRR Coordinating Committee agreed to hold a conference call to determine a scope and schedule for exploring process improvements. Mickelsen expressed agreement with Erickson's comment, and recalled that Col. Mark Deschenes and state agency leaders had positive experiences from Lean Six Sigma in their respective agencies and recommended the evaluation techniques be used for UMRR's habitat project planning.

Habitat Needs Assessment II

Tim Eagan reported that the HNA II tri-team chairs (Eagan, Sara Schmuecker, and Nate De Jager) have completed the draft project management plan (PMP) and established the steering committee and representatives for the District-based river teams. Eagan listed the limitations of the 2000 HNA, which

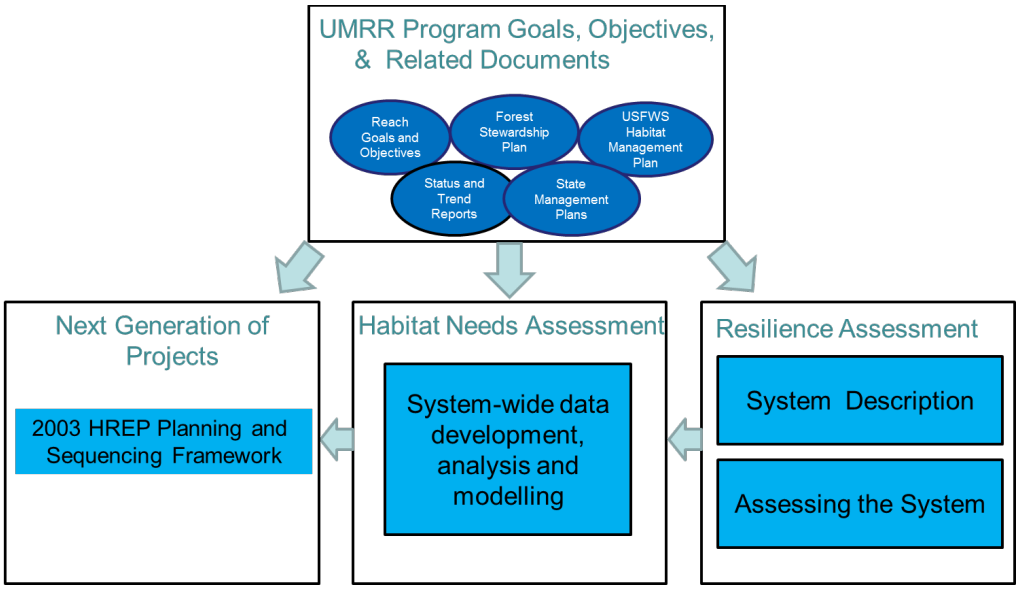
included various data, models, and surveys of fish and wildlife populations and communities. The scope of the HNA II includes the following outcomes:

- Historical changes to UMRS hydrology and habitats, assessment of previous restoration efforts, linkage of existing management objectives with resilience concepts.
- Development and use of an enhanced aquatic areas classification for the UMRS to evaluate current hydro-geomorphic and ecological conditions in aquatic areas.
- Projecting future distributions of aquatic areas and associated ecological conditions under alternative management and environmental scenarios.
- Development and use of a floodplain ecoregions classification for the UMRS to evaluate current hydro-geomorphic and ecological conditions in floodplain areas.
- Projecting future distributions of floodplain vegetation under alternative management and environmental scenarios.
- Current and projected future habitat needs for the UMRS

Eagan said the HNA II steering committee includes Tom Novak (USACE), Bob Clevenstine (USFWS), Mark Gaikowski (USGS), Kathy Kowal (USEPA), Marty Adkins (NRCS), Levi Solomon (Illinois Natural History Survey), Kirk Hansen (Iowa DNR), Dan Dieterman (Minnesota DNR), Janet Sternburg and (Missouri DoC). Jeff Janvrin will represent the FWWG (St. Paul District), Levi Solomon will represent the FWIC (Rock Island District), and Kat McCain will represent the RRAT (St. Louis District). The anticipated development schedule includes in-person steering committee meetings in this summer, fall, and winter. The goal is to provide a draft HNA II report to the UMRR Coordinating Committee at its November 2017 quarterly meeting. Hubbell noted that this is not yet an individual identified to represent the Illinois River Work Group. However, Solomon can speak to Illinois River issues and perspectives.

Integration of Ongoing Efforts

Hubbell explained that the selection of next generation of projects will be informed by the ecological resilience conceptual frameworks, results of the HNA II, and many other reference documents such as the 2008 UMRS Status and Trends Report and UMRS Forest Stewardship Plan. The selection process will be guided by the 2003 HREP Planning and Sequencing Framework, which first considers the ecological merits of the projects and then sequences them based on administrative factors. Hubbell illustrated these points through the diagram below.



Other Business

Future Meetings

The upcoming quarterly meetings are as follows:

- **August 2016 — La Crosse**
  - UMRBA quarterly meeting —August 9
  - **UMRR Coordinating Committee quarterly meeting — August 9**
- **November 2016 — Twin Cities**
  - UMRBA quarterly meeting — November 15
  - **UMRR Coordinating Committee quarterly meeting — November 16**
- **February 2017 — Quad Cities**
  - UMRBA quarterly meeting — February 7
  - **UMRR Coordinating Committee quarterly meeting — February 8**

With no further business, the meeting adjourned at 2:02 p.m.

UMRR Coordinating Committee Attendance List
May 25, 2016

UMRR Coordinating Committee Members

Don Balch	U.S. Army Corps of Engineers, MVD
Tim Yager	U.S. Fish and Wildlife Service, UMR Refuges [On behalf of Sabrina Chandler]
Jeff Houser	U.S. Geological Survey, UMESC [On behalf of Mark Gaikowski]
Dan Stephenson	Illinois Department of Natural Resources
Tim Hall	Iowa Department of Natural Resources [On behalf of Randy Shultz]
Kevin Stauffer	Minnesota Department of Natural Resources
Janet Sternburg	Missouri Department of Conservation
Jim Fischer	Wisconsin Department of Natural Resources
Marty Adkins	Natural Resources Conservation Service
Ken Westlake	U.S. Environmental Protection Agency, Region 5 [On the phone]

Others In Attendance

Thatch Shepard	U.S. Army Corps of Engineers, MVD
Barb Kleiss	U.S. Army Corps of Engineers, MVD
Chris Erickson	U.S. Army Corps of Engineers, MVP
Ken Barr	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
Angie Freyermuth	U.S. Army Corps of Engineers, MVR [On the phone]
Deanne Stausser	U.S. Army Corps of Engineers, MVS
Brian Johnson	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
Shelby Kohrmann	U.S. Army Corps of Engineers, MVS
Bryan McCabe	U.S. Army Corps of Engineers, MVS
Kat McCain	U.S. Army Corps of Engineers, MVS
Harold Deckerd	U.S. Department of Agriculture, NRCS, Missouri
Bob Clevenstine	U.S. Fish and Wildlife Service, UMR Refuges
Sara Schmuecker	U.S. Fish and Wildlife Service, RIFO
Jennie Sauer	U.S. Geological Survey, UMESC
Kristin Bouska	U.S. Geological Survey, UMESC [On the phone]
Courtney Black	NOAA, National Integrated Drought Information Systems
Lawrence Patterson	Illinois Department of Natural Resources
Dave Bierman	Iowa Department of Natural Resources
Andy Fowler	Iowa Department of Natural Resources
Mike Griffin	Iowa Department of Natural Resources
Scott Gritters	Iowa Department of Natural Resources
Kirk Hansen	Iowa Department of Natural Resources
Adam Thiese	Iowa Department of Natural Resources
Megan Moore	Minnesota Department of Natural Resources
Robert Stout	Missouri Department of Natural Resources
Andrea Collier	Missouri Department of Natural Resources
Sreedhar Upendram	Missouri Department of Natural Resources
John Petty	Wisconsin Department of Agriculture
Shawn Giblin	Wisconsin Department of Natural Resources [On the phone]
Olivia Dorothy	American Rivers
David Stokes	Great Rivers Habitat Alliance
Brad Walker	Missouri Coalition for the Environment
Gretchen Benjamin	The Nature Conservancy
Dru Buntin	Upper Mississippi River Basin Association
Dave Hokanson	Upper Mississippi River Basin Association
Kirsten Mickelsen	Upper Mississippi River Basin Association

ATTACHMENT B

UMRR Regional Management

- **UMRR Spreadsheets thru 3rd Quarter of FY 2016 (6/30/2016)** *(B-1 to B-5)*
- **OMB Memo to Federal Agencies Re Requirements for the FY 2018 Budget Process (4/29/2016)** *(B-6 to B-8)*

BUDGET SHEET

UMRR-EMP EXPENDITURES AND ALLOCATIONS

	FY16 ($ 000)				
	CARRY IN FROM FY 15	FY 16 ALLOCA.	TOTAL AVALIABLE TO EXP.	30 Jun 16 ACTUAL EXP.	30 Jun 16 ACTUAL OBLIG.
PROGRAM ELEMENTS					
HABITAT PROJECTS					
HREP PROJECTS	193	12,574	12,760	10,260	5,180
ARRA HREP PROJECTS	0	0	0	0	0
HABITAT EVAL/MONITORING	60	713	774	718	448
HABITAT NEEDS ASSESSMENT	0	250	250	26	26
PLANNING/PRIORITIZATION	0	0	0	0	0
USFWS HREP SUPPORT	0	289	289	225	261
PROGRAM COOR.(Includes District Habitat Coordination)	64	2,309	2,373	1,684	1,344
REPORT TO CONGRESS- 2014	0	65	65	70	14
REGIONAL INITIATIVES	0	345	345	91	90
LTRM (Includes LTRM Regional Technical)	0	4,629	4,629	4,124	3,388
ARRA LTRM PROJECTS	0	0	0	0	0
TOTALS	316	21,174	21,484	17,268	10,764
TOTALS BY ORGANIZATION					
MVR *	47	10,712	10,753	6,631	3,933
MVP	192	2,132	2,324	3,794	1,202
MVS	77	3,401	3,478	2,521	2,831
USGS	0	4,500	4,500	3,966	2,445
UMRBA Administration	0	76	76	61	79
USFWS (Multi-district funded)	0	289	289	225	261
REPORT TO CONGRESS- 2012	0	65	65	70	14
System Ecological Team (SET)	0	0	0	0	0
TOTAL	316	21,174	21,484	17,268	10,764

*1

* 1 Equals Work Allowance amount of $21,174,000

30 Jun 16
FY 2016

ADMINISTRATIVE, LTRM, and Non-Site Specfic Costs

	FY16 ($ 000)				
	CARRY IN	ALLOCA.	TOTAL SCHED EXP.	30 Jun 16 Actual Exp.	30 Jun 16 Actual Obl.
HABITAT (Rollup from district sheets)					
BASELINE MONITORING	23	173	196	44	45
HABITAT PROJ. EVALUATION	37	465	503	674	403
BIO-RESPONSE STUDIES	0	75	75	0	0
USFWS HREP SUPPORT (Multi-district funded)	0	289	289	225	261
PLANNING/SEQUENCING (PRIORITIZATION)	0	0	0	0	0
TOTAL HABITAT	60	1,002	1,063	942	709
PROGRAM COORDINATION (excludes District Habitat Coor.)					
UMRBA	0	76	76	61	79
System Ecological Team (SET)	0	0	0	0	0
PUBLIC INVOLVEMENT	0	60	60	153	58
EMP PROGRAM ADMINISTRATION	0	595	595	642	643
LTRM REGIONAL TECHNICAL	0	129	129	158	943
REGIONAL INITIATIVES	0	345	345	91	90
PROGRAM MGT TOTAL	0	1,205	1,205	1,104	1,812
REPORT TO CONGRESS (includes all organizations)	0	65	65	70	14
LTRM					
CORPS LTRM MANAGEMENT	0	0	0	0	0
LTRM (USGS & STATES)	0	4,500	4,500	3,966	2,445
CORPS BATHEMETRY & LiDAR (Multi-district funded)	0	0	0	0	0
ARRA - BATHEMETRY, LiDAR, & GIS (Multi-district funded)	0	0	0	0	0
CORPS APE'S ACTIVITIES	0	0	0	0	0
CORPS LTRM TECHNICAL SUPPORT (MSP)	0	0	0	0	0
SUBTOTAL	0	4,500	4,500	3,967	2,445

ST. PAUL DISTRICT

MVP	PROJECT ESTIMATE DESIGN	PROJECT ESTIMATE CONST	TOTAL W/O NON FED	NON-FED EST	EXP FOR FY 15	EXP THRU FY 15	FY16 ($ 000) CARRY IN	FY16 ($ 000) ALLOCA.	FY16 ($ 000) TOTAL AVALIABLE TO EXP.	30 Jun 16 Actual Exp.	30 Jun 16 Actual Obl.	(Federal) Scheduled $ To Complete	
HABITAT PROJECTS													
Capoli Slough, WI	500	8,750	9,250		327	6740	9	113	123	138	27	7,131	CONSTRUCTION
Conway Lake, IA	462	2,050	2,512		268	522	25	154	179	209	209	2,162	DESIGN
Harpers Slough, IA	1,500	15,000	16,500		3,028	5213	10	10	20	2,616	147	13,385	CONSTRUCTION
Lake Winneshiek, WI	620	4,380	5,000			9			0			5,000	DESIGN
Lower Pool 10 Islands/Backwater, IA	920	5,200	6,120			0			0			6,093	DESIGN
McGregor Lake, WI	900	5,600	6,500		19	171			0			6,349	DESIGN
North & Sturgeon Lakes, MN	900	7,600	8,500	1,100	408	2580	24	1,351	1,375	363	351	7,840	DESIGN
ARRA PLANING, ENG & DESIGN	0	75	75	0		75			0			75	
Other Habitat (Carry over)	0	0	0	0		0			0			0	
HABITAT TOTAL	5,802	48,655	54,457	1,100	4,050	15,310	69	1,628	1,697	3,326	734	48,035	
									0				
HABITAT EVAL/MONITORING													
HABITAT NEEDS ASSESSMENT					0	57			0	0	0		
BASELINE MONITORING					20	602	23	113	136	16	16		
HABITAT PROJ. EVALUATION					136	1907	37	125	163	161	161		
BIO-RESPONSE STUDIES						1333			0				
USFWS HREP SUPPORT					253	1598			0	15	146		
PLANNING/SEQUENCING(PRIORITIZATION)						0			0				
SUBTOTAL	0	0	0	0	409	5,497	60	238	299	192	322	0	
PROGRAM MANAGEMENT													
PROGRAM COORDINATION					332	5221	64	265	329	291	292		
PUBLIC INVOLVEMENT - mipr $						0			0				
SUBTOTAL	0.0	0.0	0.0	0.0	332	5,221	64	265	329	291	292	0	
LTRM													
LTRM COORDINATION						455	0	0	0				
ADDITIONAL LTRM						484	0	0	0				
SUBTOTAL	0	0	0	0		939	0	0	0	0	0	0	
DIRECT MVP EXPENDITURES				1,100	4,791	26,967	192	2,132	2,324	3,809	1,347	0	
								*1					
MIPR & CROSS CHARGE LABOR EXPENDITURES													
Mipr for LTRM Travel						15.1			0	0	0		
Cross charge labor Technical & Bathemetry						31.7			0	0	0		
MIPR TOTALS (Includes Public Involvement)						47	0	0	0	0	0		
TOTAL MVP EXPENDITURES					4,791	27,014	192	2,132	2,324	3,809	1,347		
								*1					
NOTES:													

*1 Equals MVP work allowance of $2,131,600 (Initial Work Allowance of 3,631,600 - $1,500,000 = 2,131,600) Funding was reallocated to MVR in the amount of $1,500,000

ROCK ISLAND DISTRICT

MVR	PROJECT ESTIMATE DESIGN	PROJECT ESTIMATE CONST	TOTAL W/O NON FED	NON-FED EST	EXP FOR FY 15	EXP THRU FY 15	FY16 ($ 000) CARRY IN	ALLOCA.	TOTAL AVALIABLE TO EXP.	30 Jun 16 Actual Exp.	30 Jun 16 Actual Obl.	(Federal) Scheduled $ To Complete	
HABITAT PROJECTS													
BEAVER ISLAND, IA	1,500	11,000	12,500		605	1,016		260	260	349	328	11,919	PLANNING
FOX ISLAND, MO	700	4,300	5,000		293	5,967		40	40	45	46	4,509	CONSTRUCTION
HURON ISLAND, IA	2,100	8,400	10,500		2,750	5,035	47	4,430	4,477	264	264	9,597	CONSTRUCTION
LAKE ODESSA, IA	2,470	12,394	14,864			15,133		357	357	2,196	175	12,578	CONSTRUCTION
POOL 11 ISLANDS, WI	1,548	14,469	16,017			10,157			0			16,017	CONSTRUCTION
POOL 12 OVER WINTER, IA	2,500	16,500	19,000		3,387	7,326		2,147	2,147	1,231	564	15,958	CONSTRUCTION
RICE LAKE, IL	2,800	10,720	13,520	6,825	692	13,065		400	400	156	127	11,846	CONSTRUCTION
TURKEY RIVER BOTTOMS	2,900	16,600	19,500		0	3			0			19,500	PLANNING
BOSTON BAY	900	5,100	6,000		21	23		4	4	81	81	5,919	PLANNING
STEAMBOAT ISLAND	1,250	6,850	8,100		0	3			0			8,100	PLANNING
KEITHSBURG DIVISION	1,400	12,100	13,500		354	368		228	228	397	340	13,091	PLANNING
DELAIR DIVISION	1,750	7,750	9,500		0	2		173	173			9,500	PLANNING
SNYDER SLOUGH	1,800	15,700	17,500		0	16			0			17,486	PLANNING
EMIQUON	242	9,700	9,942	6,400	9	242			0			9,710	DESIGN
LAKE ODESSA, IA (Flood Recovery) (supplemental)		5,500	5,500		161	5,076			0			5,326	FLOOD RECONSTR.
ARRA ODESSA		236	236			158			0			236	ARRA
OTHER HABITAT		0	0			0			0			0	
HABITAT TOTAL	23,618	148,322	171,940	6,825	8,273	95,606	47.0	8,038.5	8,086	4,718	1,925	39,233	
HABITAT													
HABITAT NEEDS ASSESSMENT						0		250	250	26	26		
BASELINE MONITORING			268			254			0				
HABITAT PROJ. EVALUATION			938		288	3,802		325	325	505	235		
BIO-RESPONSE MONITORING			588			1,036		0	0				
USFWS HREP SUPPORT					150	1,199		174	174	210	0		
PLANNING/SEQUENCING (PRIORITIZATION)						39		0	0				
SUBTOTAL	0	0	1,794	0	438	6,330	0	749	749	741	261		
PROGRAM MANAGEMENT													
REGIONAL HREP SCIENCE SUPPORT			3,496	0	388	5,856		963	963	268	0		
PUBLIC INVOLVEMENT	0.0	20.0	20.0		4	248		60	60	153	58		
REGIONAL ADMIN				0	699	3,635		595	595	642	643		
LTRM REGIONAL TECHNICAL						1,813		129	129	158	943		
PROGRAM INITIATIVES					164	1,334		345	345	91	90		
SUBTOTAL			3,516	0	1,255	12,887	0	2,092	2,092	1,311	1,733		
REPORT TO CONGRESS					26	122	0	65	65	70	14		
LTRM													
CORPS BATHEMETRY & LiDAR(Multi-district funded)					0	463	0		0	0	0		
ARRA - BATHEMETRY, LiDAR, USGS, & GIS					0	2,811	0		0				
CORPS APE'S ACTIVITIES						165	0		0				
ADDITIONAL LTRM					0	927	0		0	0			
SUBTOTAL	0	0	530	0	0	4,365	0	0	0	0	0		
MIPRS & Contracts													
UMRBA					75	314	0	76	76	61	79		
ITRC					0	0	0	0	0	0	0		
USGS					6,622	26,908	0	4,500	4,500	3,966	2,445		
FY14 Reprogram						0		6					
SUBTOTAL					6,697	27,222	0	4,582	4,576	4,027	2,524		
TOTAL MVR EXPENDITURES					16,688	146,533	47.0	15,527	15,568	10,868	6,457		
								*1					

*1 Equals MVR work allowance of $15,526,500 (14,026,500+1,500,000 = $15,526,500). MVP reallocated $1,500,000 to MVR.

ST LOUIS DISTRICT

MVS	PROJECT ESTIMATE DESIGN	PROJECT ESTIMATE CONST	TOTAL W/O NON FED	NON-FED EST	EXP FOR FY 15	EXP THRU FY 15	FY16 ($ 000) CARRY IN	ALLOCA.	TOTAL AVALIABLE TO EXP.	'30 Jun 16 Actual Exp.	'30 Jun 16 Actual Obl.	(Federal) Scheduled $ To Complete	
HABITAT													
BATCHTOWN MGMT, IL	3,220	14,875	18,095	145	96	16,892		200	200	141	141	1,158	CONSTRUCTION
CLARENCE CANNON, MO	2,637	27,180	29,817		617	2,119		950	950	882	883	27,433	DESIGN
EAGLES NEST & PIASA IS., IL	1,057	4,500	5,557		280	712		300	300	217	217	4,908	FACT SHEET
GLADES WETLAND, IL	3,218	14,000	17,218		32	32		100	100	9	9	17,209	DESIGN
HARLOW ISLAND	750	13,750	4,500		330	390		325	325	261	261	4,179	DESIGN
RIP RAP LANDING	1,373	10,553	11,926	1,207	13	761		50	50	10	10	11,168	DESIGN
POOL 24 ISLANDS	1,373	8,119	9,492			8		10	10			9,484	DESIGN
POOLS 25/26, MO	875	1,600	2,475		143	1,219		50	50	10	10	1,389	CONSTRUCTION
REDS LANDING,	621	2,863	3,484			0		10	10			3,484	DESIGN
SCHENIMANN CHUTE, MO	691	2,800	3,491			396		10	10			3,095	DESIGN
TED SHANKS, MO	4,405	25,101	29,506		7,460	20,080	77	866	943	560	864	16,326	CONSTRUCTION
WILKINSON ISLAND	1,250	2,730	3,980	0		876		10	10			3,104	DESIGN
WEST ALTON ISLAND	805	5,727	6,532		4	21		10	10	4	4	6,511	DESIGN
HORSESHOE LAKE	1,520	12,750	14,270		9	49		10	10			14,230	DESIGN
FT. CHARTRES SIDE CHANNELS, IL	650	2,650	3,300			44			0			3,256	DESIGN
ESTABLISHMENT CHUTE SC, MO	650	2,250	2,900			24			0			2,876	FACT SHEET
KASKASKIA OXBOWS, IL	750	3,500	4,250			0			0			4,250	FACT SHEET
ARRA RIPRAP LANDING	0	319	319			319			0			0	ARRA
ARRA BATCHTOWN	0	3,405	3,405			3,261			0			144	ARRA
ARRA SWAN LAKE	0	1,109	1,109			1,109			0			0	ARRA
(Other Unexpended Carryover)	0	184	184		122	184			0	122	122	0	
HABITAT TOTAL	25,845	159,965	175,810	1,352	9,106	63,700	77	2,901	2,978	2,216	2,521	134,204	
HABITAT EVAL/MONITORING													
HABITAT NEEDS ASSESSMENT	1,000		1,000			0							
BASELINE MONITORING					74	1,446		60	60	28	29		
HABITAT PROJ. EVALUATION					39	705		15	15	8	8		
BIO-RESPONSE MONITORING						1,184		75	75		0		
USFWS HREP SUPPORT					83	697		115	115	0	115		
PLANNING/SEQUENCING(PRIORITIZATION)						4			0				
SUBTOTAL	1,000	0	1,000	28,347	196	4,036	0	265	265	36	152		
PROGRAM MANAGEMENT													
PROGRAM COORDINATION					499	2,784		350	350	269	273		
PUBLIC INVOLVEMENT					0	0			0				
SUBTOTAL	0	0	0	0	499	2,784	0	350	350	269	273		
LTRM													
LTRM COORDINATION					0	0			0				
ADDITIONAL LTRM					0	0			0				
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0		
DIRECT MVS EXPENDITURES	26,845	159,965	176,810	29,699	9,801	70,520	77	3,516	3,593	2,521	2,946		
								*1					
MIPR EXPENDITURES													
LTRM mipr for Travel					0	444	0		0	0	0		
LTRM Bathemetry & Technical cross chrg					0	28	0		0	0	0		
MIPR/ Cross charge totals					0	472	0		0	0	0		
TOTAL MVS EXPENDITURES					9,801	70,992	77	3,516	3,593	2,521	2,946		
NOTES:								*1					

*1 Equals MVS work allowance of $3,515,900.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

THE DIRECTOR

April 29, 2016

M-16-10

MEMORANDUM FOR THE HEADS OF DEPARTMENTS AND AGENCIES

FROM: Shaun Donovan
Director

SUBJECT: Requirements for the FY 2018 Budget Process

This memorandum describes the Administration's plans for the development of budget data and other materials necessary for the Fiscal Year (FY) 2018 budget process in order to support a smooth transition.

The FY 2018 Budget will be submitted by the next President. In order to lay the groundwork for the incoming administration, we intend to prepare a budget database that includes a complete current services baseline. OMB also plans to gather information necessary to develop current services program estimates for FY 2018, as well as other budget and programmatic information from which the incoming administration can develop its budget proposals.

Budget Submissions

You are not required to submit a formal budget request to OMB in September, and there will be no formal Director's Review or Passback processes this fall. Most of the policy materials you usually submit in September in support of your budget requests will not be required until after the new administration (or a transition team) is in place, although you may be asked to provide information on selected topics by your OMB representatives.

At the end of this memo is a schedule for constructing a complete baseline budget database by account for FYs 2018 through 2027, as well as actual data for the prior year (PY) and estimates for the current year (CY), by the middle of December. You will be asked to complete the technical review of PY and CY data and to develop budget year and outyear baseline estimates.

At this time, you should proceed with your internal review procedures to prepare information to help the next administration quickly produce its budget. Specifically, you should work with your OMB representatives to identify information needed to develop program-level current services estimates. Such information might include the identification of recurring and

non-recurring costs in FYs 2017 and 2018, FTE levels and personnel costs assuming current services, and estimates of program utilization for FY 2018.

You should also work with your OMB representatives to identify key programmatic and budget issues that may require attention from the incoming administration. For example, this may include areas in which the implementation of program changes due to legislation or policy is in process and may require a decision on continuation; areas in which future funding needs may be significantly different than a standard current services baseline; or issues with significant budgetary implications that could require decisions early in the next administration. Please be prepared to provide the above information to your OMB representatives in September.

The President's Management Agenda

The FY 2018 performance plan will be developed to align with the incoming administration's policies and will be published concurrent with your final FY 2018 congressional budget justifications. Therefore, you do not need to submit to OMB the FY 2018 performance plan components of your budget materials until a new administration (or transition team) is in place. As with your budget materials, you should proceed with your internal review procedures to prepare information to help the next administration quickly produce the performance plans and reports.

In addition, agencies should adhere to on-going IT and cybersecurity related reporting requirements. As the Administration continues to focus on implementing the Federal Information Technology Acquisition Reform Act (FITARA), IT Capital Planning and Investment Control process changes for the FY 2018 budget cycle are forthcoming and will focus on empowering agency CIOs. Details on these requirements will be specified in OMB Circular A-11 and OMB IT Budget – Capital Planning Guidance.

Additional Guidance

OMB Circular A-11 provides guidance on the preparation and submission of budget estimates and the timing and use of relevant economic assumptions. Most of the transition-related updates to A-11 relate to timing and not specific requirements associated with the FY 2018 Budget developed for transmittal by the incoming administration. OMB plans to issue the revised Circular in June.

OMB expects to provide guidance during the transition on policy development for FY 2018 that will describe the process and timing for submitting agency requests, information required for analytical purposes, and other materials that will be used to prepare the incoming administration's budget.

FY 2018 Transition Data and Budget Information: Tentative Schedule

OMB Circular A-11 issued	June
Agencies submit budget information to OMB	September
GTAS revision window opens	October 18

MAX database available for agency input	November 1
MAX A-11 PY lock and GTAS revision window closes	November 15
MAX baseline closed for agencies	December

ATTACHMENT C

Habitat Restoration

- **Preliminary Agenda for the September 27-29, 2016 UMRR Habitat Project Planning and Design Workshop**
  (C-1 to C-3)

Upper Mississippi River Restoration Program
HREP Workshop

September 27-29, 2016
Davenport, Iowa

Draft Preliminary Agenda

Meeting Objectives

- Build relationships and facilitate dialogue among UMRR's restoration practitioners, planners, engineers, and scientists
- Discuss insights gained about project design, construction, monitoring, and OMRR&R
- Strengthen UMRR's restoration efforts by learning from insights gained as discussed above

Lunch on Day 2 — Box lunches will be available for purchase of $10 on Wednesday, September 28

Agenda

Day One – September 27

12:00 noon **Welcome and Introductions**

12:10 p.m. **UMRR: History and Future Outlook**
Marv Hubbell will give an overview of UMRR's authorization, evolution of habitat project selection, and how habitat restoration projects will aim to improve the river's ecological health and resilience.

12:20 **Partner Agency/Organization HREP-Related Priorities and Perspectives**
Read ahead packets will include agency/non-profit organization organizational charts and points-of-contact for HREPs. Each agency will have five minutes to discuss their respective priorities and perspectives for HREPs.

1:10 **USACE District HREP Reports**
Each District provides an overview of the current status and future plans of individual HREP projects and a synopsis of the types of restoration techniques and approaches typically used to address common ecological needs.

2:40 **Break**

3:00 **Corps Project Planning Process**
USACE will summarize the many stages of the HREP planning process, including the sponsors' decision points.

3:30 p.m. **USFWS and State Regulations, Policies Affecting HREP Construction**
USFWS Ecological Services and Refuge staff and State agency staff will overview regulations and policies affecting the construction of HREPs. This includes, but is not limited to, the ESA, special use permits, floodplain regulations (no rise standard in some states).

5:00 p.m. **Adjourn for the Day**

Day Two – September 28

8:00 a.m. **Welcome, Announcements, and Recap of Day 1**

8:20 **Application of Ecological Resilience through HREPs**
USGS discusses how the ecological resilience models can be used by restoration practitioners to inform project objectives, and measure the individual and cumulative impact of HREPs on ecological resilience. USACE discusses climate change analyses and how these factors could be incorporated into future project design.

8:55 **Forest Enhancement Restoration Techniques**

10:15 **Break**

10:35 **Sedimentation and Dredging Approaches**
Presentations are given re sedimentation rates and impacts to backwaters, as well as dredging techniques and implementation considerations.

11:15 **HREP Construction Considerations**
Participants discuss the various considerations involved in project construction associated with technical/process issues such as contractor oversight or non-federal sponsor requirements as well as issues operating in a highly dynamic ecosystem with floods, droughts, and changed site conditions.

12:15 p.m. **Lunch** *(Boxed lunches will be available for purchase of $10.)*

1:15 **Hydraulic Connectivity**
Presentations will be given on the insights gained re hydraulic connectivity needs for fish and wildlife habitat from upper and lower portions of the UMRS.

2:45 **Break**

3:15 **Water Level Management Design and Operations**

4:05 **Operations and Maintenance**
USFWS provides an overview of typical OMRR&R obligations, including daily operations and annual funding requirements.

5:00 p.m. **Adjourn for the Day**

Day Three – September 29

8:00 a.m. **Welcome, Announcements, and Recap of Day 2**

8:10 **Purpose of UMRR's Monitoring**
Marv Hubbell discusses the original call for UMRS monitoring and its importance to understand the ecosystem's health and resilience in the future, and the need for monitoring to determine and communicate HREP's impacts on the ecosystem's health and resilience.

(Continued)

Day Three – September 29 (Continued)

8:30 a.m. **Overview of UMRR LTRM and HREP Data Collection**
USGS gives an overview of LTRM's data collection, including the six field station monitoring network, ecological attributes monitored, and online accessibility. USACE will overview the historical approach to project monitoring and evaluations.

8:50 **Objectives for Future HREP Monitoring**
General discussion of what we want to answer through HREP monitoring – individual project success, how to design projects for achieving specific ecological needs, the effects of HREPs in improving the health and resilience of lotic, lentic, floodplain forest systems?

9:30 **Break**

9:50 **Break Out Sessions**
Participants are convened in several small groups to discuss HREP monitoring for the objectives identified above – what do we need to monitor and how to answer the things we want to know. Participants will be asked to think about monitoring for migratory birds, fisheries, forests, and aquatic and wetland vegetation.

10:50 **Break**

11:00 **Facilitated Discussion**
Participants will engage in a facilitated discussion about HREP monitoring reflecting input from the break out group sessions.

12:15 p.m. **Workshop Summary and Next Steps**

12:30 p.m. **Adjourn for the Day**

ATTACHMENT D

Long Term Resource Monitoring and Science

- **FY 2014 UMRR Science Activities in Support of Restoration and Management (7/22/2016)** *(D-1 to D-3)*
- **FY 2015 UMRR Science Activities in Support of Restoration and Management (7/25/2016)** *(D-4 to D-5)*
- **Base Monitoring Scope of Work thru 3rd Quarter of FY 2016 (7/22/2016)** *(D-6 to D-9)*
- **FY 2016 UMRR Science Activities in Support of Restoration and Management (7/22/2016)** *(D-10 to D-13)*

UMRR Science in Support of Restoration and Management
FY2014 Scope of Work
July 2016 Status

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Seamless Elevation Data						
2014LB1	LiDAR Tier 1, processing and meta data, data on line: Pools 15-19, Pool 25 – Open River, Kaskaskia, IL River all pools	30-Mar-15		18-Dec-14		Dieck, Rohweder, Nelson, Fox
2014LB2	LiDAR Tier 3, processing and meta data, data on line: Pools 4, 5, 7, 8, 9, 10, 13, and 21	30-Mar-15		7-Apr-15		Dieck, Rohweder, Nelson, Fox
Land Cover / Land Use data and Accuracy Assessment/Validation for UMRS						
2014V2	Complete remaining 70% of the 2010/11 LCU database for UMR Open River North	30-Sep-14	30-Jan-15	21-Jan-15		Robinson, Hoy, Hanson, Langrehr, Ruhser, Nelson
2014V4	Final LTRMP Completion Report on Accuracy Assessment	30-Sep-14		17-Nov-14	In USGS SPN for Publication	Ruhser, Jakusz
Standardized HREP Non-forested Wetland Plant Sampling Protocol						
2014NFW1	draft NFW monitoring protocol	28-Feb-14		28-Feb-14		McCain
2014NFW2	Final draft NFW monitoring protocol	30-Mar-14		31-Mar-14		McCain
2014NFW3	A-Team review	1-Apr-14		7-Apr-14		McCain
2014NFW4	completed NFW monitoring protocol available	30-Sep-14		completed		McCain
Standardized HREP Forested Wetland Plant Sampling Protocol						
2014FW1	draft FW monitoring protocol	30-Nov-13		30-Nov-13		McCain
2014FW2	Final draft FW monitoring protocol	30-Mar-14		31-Mar-14		McCain
2014FW3	A-Team review	1-Apr-14		7-Apr-14		McCain
2014FW4	completed FW monitoring protocol available	30-Sep-14		completed		McCain
Predictive Model for Aquatic Cover Types						
2014AQ1	Complete hydraulic model of existing conditions	30-Apr-14	11-Jul-14	11-Jul-14		Hendrickson
2014AQ2	Compile vegetation data and develop empirical equations, Stoddard as pilot	31-Aug-14		31-Aug-14		Yin, Rogala, Ingvalson, Potter
2014AQ3	Apply equations to Pool 3 for pre-existing conditions, North & Sturgeon	30-Sep-14	28-Nov-14	completed		Yin, Rogala, Ingvalson, Potter
2014AQ4	Final model and outputs	31-Dec-14		completed		Yin, Rogala, Ingvalson, Potter
UMRS Vegetation Handbook						
2014VH1	Acquire new field images for handbook	30-Sep-14		30-Sep-14		Dieck, Langrehr, Hoy, Robinson, Ruhser
2014VH2	Draft updates to technical sections and vegetation descriptions	31-Dec-14		31-Dec-14		Dieck, Langrehr, Hoy, Robinson, Ruhser
2014VH3	Finalize handbook and submit for USGS review	31-Mar-15		31-Mar-15	In USGS SPN for Publication	Dieck, Langrehr, Hoy, Robinson, Ruhser
Phase 2 Geospatial Data Upgrades						
2014GDU1	Complete geodatabases by pool for the entire UMRS	30-Sep-14	30-Apr-15	4-May-15		Nelson, Robinson
20144GDU2	Complete KMZ files for river miles, levees, boat access points, wing dams, aquatic areas, and remaining land cover data	30-Sep-14	31-Jul-15	30-Sep-15		Nelson, Robinson

UMRR Science in Support of Restoration and Management
FY2014 Scope of Work
July 2016 Status

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Spatial Data Query Tool						
2014SDQ1	Compile all LTRMP sampling data collected through 2013 and convert to a useable format	1-Aug-14		1-Aug-14		Rohweder, Fox
2014SDQ2	Create a web-based platform that contains all spatial data; convert all queries to ArcGIS	31-Dec-14	30-Aug-15	30-Sep-15		Rohweder, Fox
2014SDQ3	SDQT beta tested and ready for USGS review	31-Mar-15	30-Nov-15	21-Dec-15	New ArcGIS server was needed, original server was taken offline because of compliance issue	Rohweder, Fox
UMRS Data Map						
2014DM1	Include all UMRR-EMP data created at UMESC in the data map	30-Sep-14	30-Nov-14	31-Dec-14	UMESC will update as new datasets come online in the future	Nelson, Ruhser
2014DM2	Include all UMRR-EMP publications from http://umesc.usgs.gov/reports_publications/ltrmp_rep_list.html in the data map	31-Dec-14	9/31/2015	31 Sep 15	The tool still needs UMRR branding, waiting to get logo or something official from Karen. Modifications and updates will continue. Tool will also be linked to the UMESC web page	Nelson, Ruhser
2014DM3	Include additional state and federal data references in the data map	31-Mar-15		30-Jun-15	Not all state and federal data sources have the same metadata available making it more difficult than initially expected. New OMB guidelines will correct this. UMESC will continually updated site as new metatadata are made available	Nelson, Ruhser
Assessing System-wide Hydrodynamic Model Availability						
2014SHM1	Kick off Email to workshop participants	30-Apr-14		21-Apr-14		Theiling
2014SHM2	Compile list of UMR-IWW hydrologic models	31-May-14		31-May-14		Theiling
2014SHM3	Complete read-aheads	15-Jun-14	14-Jul-14	14-Jul-14		Theiling
2014SHM4	Conduct workshop/webinar	1-Jul-14	12-Aug-14	21-Aug-14	July dates did not work for attendees	Theiling
2014SHM5	Summarize webinar	31-Jul-14	31-Aug-14	30-Sep-14		Theiling
2014SHM6	Draft white paper	31-Aug-14	15-Aug-14	30-Sep-14		Theiling
2014SHM7	*draft* Final white paper	30-Sep-14	31-Dec-14	31-Dec-14	draft final submitted 31 Dec 14. Additi	Theiling
2014SHM8	final white paper	1-Apr-15		4-Apr-15		Theiling
Development of Mussel Vital Rates						
2014MVR1	Brief summary report	30-Sep-15		30-Sep-15	completed, in UMESC review	Newton, Zigler, Davis
2014MVR2	Brief summary report	30-Sep-16				Newton, Zigler, Davis
2014MVR3	Completion report on a vital rates of native mussels at West Newton Chute, UMRS	30-Sep-17				Newton, Zigler, Davis

UMRR Science in Support of Restoration and Management
FY2014 Scope of Work
July 2016 Status

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Validation of Mussel Community Asessment Tool						
2014MCA1	Workshop of mussel experts in UMRS	1-May-15		19-Feb-15		Newton, Zigler, Dunn, Duyvejonck
2014MCA2	Draft completion report on a validated mussel community assessment tool for use by river managers	1-Dec-15	1-Mar-16	27-Apr-16	state biologists are still ranking beds as part of validation	Newton, Zigler, Dunn, Duyvejonck
2014MCA3	Final completion report on a validated mussel community assessment tool for use by river managers	1-Mar-16	1-Sep-16		in USGS review	Newton, Zigler, Dunn, Duyvejonck
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	13-Mar-17		Working With UWL staff. Analysis will have to be conducted after academic year.	Giblin, Campbell, Houser, Manier
2014NC3	Full manuscript completed	13-Mar-18				Giblin, Campbell, Houser, Manier
Ecological Shifts Turbid to Clear States						
2014ES1	Literature review and initial analyses competed	13-Mar-15		15-Nov-14		Giblin, Ickes, Langrehr, Bartels
2014ES2	Refined analyses and draft manuscrpt prepared	13-Mar-16		4-Jan-16	reconciling journal review comments	Giblin, Ickes, Langrehr, Bartels
2014ES3	Manuscipt submitted for publication	13-Mar-17				Giblin, Ickes, Langrehr, Bartels
Invasive Carp Population Demographics (#1)						
2014CPD1	Summary letter	31-Jan-15		16-Jan-15		Phelps, Mccain
2014CPD2	Manuscript	31-Mar-16		1-Jul-15	Management of Biological Invasions (2015) Volume 6; http://www.reabic.net/journals/mbi/2015/Accepted.aspx	Phelps, Mccain
Asian Carps Recruitment Sources (#2)						
2014CRS1	Summary letter	31-Jan-15		16-Jan-15		Phelps, Mccain
2014CRS2	Manuscript	31-Mar-16	30-Aug-16			Phelps, Mccain
Effects of Asian Carps on Native Piscivore Diets (#3)						
2014NPD1	Summary letter	31-Jan-15		16-Jan-15		Phelps, Mccain
2014NPD2	Manuscript	31-Mar-16	30-Oct-16			Phelps, Mccain
Early Life History of Invasive Carps (#4)						
2014CLH1	Summary letter	31-Jan-15		16-Jan-15		Phelps, Mccain
2014CLH2	Manuscript	31-Mar-16		1-Jan-16	in press	Phelps, Mccain

UMRR Science in Support of Restoration and Management
FY2015 Scope of Work
July 2016 Status

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Seamless Elevation Data						
2015LB1	Tier 2 LiDAR for Pools 14-19	31-Mar-15		15-Apr-15		Dieck, Hanson
2015LB2	Tier 2 LiDAR for Pool 25-OR & Kaskaskia	30-Jun-15		30-Jun-15	All pools but Pool 26 are complete.	Dieck, Hanson
2015LB2b	Tier 2 LiDAR for Pool 26	30-Jun-15	30-Nov-15	30-Nov-15	It has been discovered that Pool 26 lidar has serious problems. Still working to resolve. Separate line item created.	
2015LB3	Tier 2 LiDAR for the Illinois River	30-Sep-15	30-Nov-15	30-Nov-15	The lidar was not classed to ASPRS specifications, resulting in the need to reclassify a lot of the data	Dieck, Hanson
2015LB4	All remaining Bathymetry	30-Sep-15		1-Apr-15		Dieck, Hanson
2015LB5	Seamless Elevation for Pools 2, 5a, 6, 10-12, St Croix, and Pool 14	31-Dec-15	31-Jan-16	15-Apr-16	All pools completed and in FSP review except for Pool 2 and St. Croix; Pool 2 will be completed once we acquire and process the new lidar data sets for counties in Twin Cities; Target date to complete Pool 2 seamless data set is 12/31/16; no bathmetry data exists for St. Croix so seamless layer cannot be completed.	Dieck, Hanson
2015LB6	Seamless Elevation for Pools 15-19, 20, and 22-24	31-Mar-16		15-Apr-16	Separate line item needs to be created for Pool 19 due to bathymetry issue; Target date to complete Pool 19 is 12/31/2016; All remaining Pools completed and in FSP review.	Dieck, Hanson
2015LB7	Seamless Elevation for Pools 25-OR & Kaskaskia	30-Jun-16	15-Aug-16		We continue to have a number of issues concerning the Pool 26 bathymetry. We plan to deliver the Pool 26 seamless layer on the Sept 30 deadline in place of completeing Marseilles and Starved Rock with this group of products.	Dieck, Hanson
2015LB8	Seamless Elevation for the Illinois River	30-Sep-16				Dieck, Hanson
Producing NED ready LiDAR products						
2015NED1	Perry County, MO	31-Jul-15		30-Sep-15		Nelson, Dieck
2015NED2	Remaining portions of the middle Mississippi (OR1 & 2)	31-Jul-15		30-Sep-15		Nelson, Dieck
2015NED3	Area of the Upper Mississippi (Pool 25-26)	30-Sep-15	6-Nov-15	22-Jan-16	Data are being hand delivered to the Rolla office 1-29-2016	Nelson, Dieck
2015NED4	Illinois River area	30-Sep-15	11-Dec-15	22-Jan-16	Data are being hand delivered to the Rolla office 1-29-2016	Nelson, Dieck
Pool 12 AM monitoring (crappie telemetry)						
2015AM1	Capture fish and affix radio tags to white crappies in study lakes	1-Nov-14		2-Apr-15		Bierman, Hansen, Bowler, Theiling
2015AM2	Location of tagged fish and update in-house project database	Ongoing through FY		30-Sep-15		Bierman, Hansen, Bowler, Theiling
2015AM3	Complete tracking portion of study	30-Sep-15		30-Sep-15		Bierman, Hansen, Bowler, Theiling
Fish Indicators of Ecosystem Health						
2015FI1	Preliminary set of species identified for the different assemblages by study reach submitted to A-Team as status update and for review	30-Aug-15	10-Feb-16	16-Feb-16	Post doc hiring delay resulted in project delayed	Anderson, Casper, McCain
2015FI2	Draft recommendation for the best attainable or target for each assemblage by study reach submitted to A-Team for Review	1-Oct-15	10-Feb-16	16-Feb-16	For presentation at 2016 UMRR Science Mtg in La Crosse briefing	Anderson, Casper, McCain
2015FI3	Initial draft Project Report submitted to A-Team for review	1-Dec-15	15-Mar-16	30-Mar-16	Incorporate feedback from 2016 UMRR Science Mtg presentation into La Crosse A-team briefing	Anderson, Casper, McCain
2015FI4	Final draft Project Report submitted to A-Team for review and endorsement at August meeting	1-Mar-16	1-Jun-16			Anderson, Casper, McCain
2015FI5	Final draft Project Report submitted to UMRR CC for endorsement at November meeting	15-Jul-16	15-Jul-16			Anderson, Casper, McCain
2015FI6	Final Report	1-Jun-16	30-Aug-16			Anderson, Casper, McCain

UMRR Science in Support of Restoration and Management
FY2015 Scope of Work
July 2016 Status

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Plankton community dynamics in Lake Pepin						
2015LPP1	Phytoplankton processing; species composition, biovolume	30-Dec-15		22-Oct-15		Burdis
2015LPP2	draft manuscript: Plankton community dynamics in Lake Pepin	30-Sep-16				Burdis
Estimating trends in UMRR fish and vegetation levels using state-space models						
2015SST1	Draft completion report: Evaluation of trend estimation methods for LTRM fish and vegetation indices	30-Sep-15	15-Dec-15	29-Jan-16	Project delayed by computing challenges.	Gray
2015SST2	Final completion report: Evaluation of trend estimation methods for LTRM fish and vegetation indices	31-Dec-15	15-Mar-16	27-Mar-16		Gray
2015SST3	Provide trend estimates for fish and vegetation web browser pages	30-Sep-16				Gray, Schlifer
Generating and serving presumptive habitat maps for 28 UMRS fish species						
2015FI1	Assemble requisite data resources	28-Feb-15		15-Jan-15		Ickes
2015FI2	Generate "point" maps of predictions	30-Mar-15	15-May-15	15-May-15		Hlavacek
2015FI3	Generate "splines with barriers" interpolated maps	15-May-15	30-Jul-15	on schedule		Hlavacek
2015FI4	Post maps to the UMRR LTRM fish component homepage	15-Jun-15	15-Sep-15	15-Sep-15		Ickes
2015FI5	Issue/publish a brief communication on their availability and prospective usage	15-Sep-15	31-Oct-15	21-Dec-15		Ickes
Predictive Aquative Cover Type Model - Phase 2						
2015AQ1	Develop 2-D hydraulic model of upper Pool 4	30-Sep-15		30-Sep-15		Libbey (MVP H&H)
2015AQ2	Apply model to Pool 4 and resolve discrepancies	31-Dec-15	31-Mar-16	31-Mar-16		Yin, Rogala
2015AQ3	Detailed summary of work for Phases I & II	31-Dec-15	30-Jun-16		Resolving model discrepancy took longer than anticipated. Needs extension of summary deadline	Yin, Rogala, Ingvalson
Landscape Pattern Research on the UMRS: synthesis and significance, FY16-18						
	Milestones will be coordinated through the UMRR annual scope of work process					De Jager
Developing and Applying Indicators of Ecosystem Resilience to the UMRS						
	Milestones will be coordinated through the UMRR annual scope of work process					work group, post doc

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Aquatic Vegetation Component						
2016A1	Complete data entry and QA/QC of 2015 data; 1250 observations.					
	a. Data entry completed and submission of data to USGS	30-Nov-15		30-Nov-15		Moore, Drake, Vogeler
	b. Data loaded on level 2 browsers	15-Dec-15		15-Dec-15		Schlifer
	c. QA/QC scripts run and data corrections sent to Field Stations	28-Dec-15		28-Dec-15		Sauer, Schlifer
	d. Field Station QA/QC with corrections to USGS	15-Jan-16		15-Jan-16		Moore, Drake, Vogeler
	e. Corrections made and data moved to public Web Browser	30-Jan-16		21-Jan-16		Yin, Sauer, Schlifer, Caucutt
2016A2	Web-based: Creating surface distribution maps for aquatic plant species in Pools 4, 8, and 13; 2014 data	31-Jul-16				Yin, Rogala, Schlifer
2016A3	Wisconsin DNR annual summary report 2015 that combines current year observations from LTRM with previous years' data, for the fish, aquatic vegetation, and water quality components.	30-Sep-16				Drake, Bartels, Hoof, Kalas
2016A4	Complete aquatic vegetation sampling for Pools 4, 8, and 13 (Table 1)	31-Aug-16				Yin, Moore, Drake, Vogeler
2016A5	Graphical summary and maps of aquatic vegetation current status and long-term trends.	30 Oct. 2015		12-Oct-15		Moore
Intended for distribution						
LTRM Technical Report: Ecological Assessment of High Quality UMRS Floodplain Forests (2007APE12; Chick, Guyon, Battaglia) (in USGS review)						
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)						
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)						
Manuscript: A statistical model of species occupancy using the LTRM aquatic vegetation data (2013A7; Yin) (in USGS review)						
Fisheries Component						
2016B1	Complete data entry, QA/QC of 2015 fish data; ~1,590 observations					
	a. Data entry completed and submission of data to USGS	31-Jan-16		31-Jan-16		DeLain, Bartels, Bowler, Ratcliff, Gittinger, West, Solomon, Pendleton
	b. Data loaded on level 2 browsers; QA/QC scripts run and data corrections sent to Field Stations	15-Feb-16		15-Feb-16		Ickes, Schlifer
	c. Field Station QA/QC with corrections to USGS	15-Mar-16		15-Mar-16		DeLain, Bartels, Bowler, Ratcliff, Gittinger, West, Solomon, Pendleton
	d. Corrections made and data moved to public Web Browser	30-Mar-16		30-Mar-16		Ickes, Sauer, and Schlifer
2016B2	Update Graphical Browser with 2015 data on Public Web Server.	31-May-16		31-May-16		Ickes, Sauer, DeLain, Bartels, Bowler, Ratcliff, Gittinger, West, Solomon, Pendleton, Schlifer
2016B3	Complete fisheries sampling for Pools 4, 8, 13, 26, the Open River Reach, and La Grange Pool (Table 1)	31-Oct-16				Ickes, DeLain, Bartels, Bowler, Ratcliff, Gittinger, West, Solomon, Pendleton
2016B4	Summary Letter: Floodplain fisheries sampling	31-Oct-16				West, Sobotka
2016B5	IDNR Fisheries Management State Report: Fisheries Monitoring in Pool 13, Upper Mississippi River, 2015	30-Jun-16		4-Mar-16		Bowler

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2016B6	Sample collection, database increment, Summary letter on Asian carp age and growth: collection of cleithral bones	31-Jan-16		22-Apr-16		Solomon, Pendleton, Casper
2016B7	Sample collection, database increment, letter summary: Collection and archiving of age and growth structure for selected species in the La Grange Reach of the Illinois River	31-Jan-16		22-Apr-16		Solomon, Pendleton, Casper
2016B8(D)	Database increment: Stratified random day electrofishing samples collected in Pools 9–11	30-Sep-16				Bowler
2016B9(D)	Database increment: Stratified random day electrofishing samples collected in Pools 16–18	30-Sep-16				Bowler
2016B10	Summary Letter: Open River Chevron Dike monitoring	31-Oct-16				West, Sobotka
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)						
Manuscript: Determining environmental history of three sturgeon species in the Upper, Middle, and Lower Mississippi Rivers. (2013B22; Phelps) (in review Journal of Fish Biology)						
Manuscript: Age-0 sturgeon habitat associations in the free flowing portion of the Upper Mississippi River (2012B5; Tripp, Phelps, Herzog) (in review Journal of Fish Biology)						
LTRM Fact Sheet: Tree map tool for visualizing fish data, with example of native versus non-native fish biomass (2013B16) (in USGS review)						
Water Quality Component						
2016D1	Complete calendar year 2015 fixed-site and SRS water quality sampling	31-Dec-15		31-Dec-15		Houser, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka
2016D2	Complete laboratory sample analysis of 2015 fixed site and SRS data; Laboratory data loaded to Oracle data base.	15-Mar-16		15-Mar-16		Yuan, Schlifer
2016D3	1st Quarter of laboratory sample analysis (~12,600)	30-Dec-16		30-Dec-16		Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Cook, Sobotka
2016D4	2nd Quarter of laboratory sample analysis (~12,600)	30-Mar-16		30-Mar-16		Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka
2016D5	3rd Quarter of laboratory sample analysis (~12,600)	29-Jun-16		29-Jun-16		Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka
2016D6	4th Quarter of laboratory sample analysis (~12,600)	28-Sep-16				Yuan, Manier, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka
2016D7	Complete QA/QC of calendar year 2015 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-16		15-Mar-16		Schlifer, Rogala, Houser
	b. Field Station QA/QC; USGS QA/QC.	15-Apr-16		30-Mar-16		Houser, Rogala, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka
	c. Corrections made and data moved to public Web Browser	30-Apr-16		7-Apr-16		Rogala, Schlifer, Houser
2016D8	Complete FY2015 fixed site and SRS sampling for Pools 4, 8, 13, 26, Open River Reach, and La Grange Pool	30-Sep-16				Houser, Burdis, Kalas, Kueter, L. Gittinger, Kellerhals, Sobotka

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
2016D9	WEB-based annual Water Quality Component Update w/ 2015 data on Server.	30-May-16		30-May-16		Rogala
2016D10	Draft Completion report: Evaluation of water quality data from automated sampling platforms	30-Sep-16				Soeken-Gittinger,
2016D11	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-16				Kalas, Hoff, Bartel, Drake
2015D11	Draft report/manuscript: Developing continuous water quality monitoring methods in the UMR	1-Sep-16				Chick, Houser
2015D12	Final report/manuscript: Developing continuous water quality monitoring methods in the UMR	1-Sep-17				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)						
LTRM report: Main channel/side channel report for the Open River Reach. (2005D7; Hrabik) (in USGS review)						
Manuscript:Contrasts between channels and backwaters in a large, floodplain river: testing our understanding of nutrient cycling, phytoplankton abundance, and suspended solids dynamics (2012D10; Houser) (Accepted for publication; Freshwater Science)						
Completion report, compilation of 3 years of sampling: Water Quality (2009R1WQ; Giblin, Burdis) (in USGS review)						
Manuscript: Trends in suspended solids, nitrogen, and phosphorus in select upper Mississippi River tributaries, 1991-2011 (Kreiling and Houser, 2013D14) (in USGS review)						
Manuscript: Relationship between the temporal and spatial distribution, abundance, and composition of zooplankton taxa and hydrological and limnological variables in Lake Pepin (2013D17; Burdis)(ready for submission to Journal)						
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						
2016LC1	Maintenance ArcGIS server	30-Sep-16				Hlavacek, Fox, Rohweder
2016LC2	Aerial Photo scanning; year 1 key pools	30-Sep-16				Ruhser
2016LC3	Bathymetry footprint	30-Sep-16				Stone, Hanson
2016LC4	Updates on progress for land cover products listed.	New progress reported in the quarterly activities. Percent complete updated 30 Sept 2016.				Robinson
Data Management						
2016M1	Update vegetation, fisheries, and water quality component field data entry and correction applications.	30-May-16		30-May-16		Schlifer
2016M2	Load 2015 component sampling data into Oracle tables and make data available on Level 2 browsers for field stations to QA/QC.	30-Jun-16		30-Mar-16		Schlifer
2016M3	Update Graphical Water Quality SRS Data browser from java applet based to html5 JavaScript plugin free version.	1-Nov-15		1-Nov-15		Schlifer
2016M4	Update Graphical Fisheries Data browser from java applet based to html5 JavaScript plugin free version.	25-Jan-16	30-Jun-16	12-Jul-16	Currently undergoing testing before final release	Schlifer
2016M5	Update Aquatic Vegetation Graphical SRS Data browser from java applet based to html5 JavaScript plugin free version.	1-Mar-16	30-Jul-16			Schlifer
2016M6	Rewrite Fisheries Data Download Query to increase efficiency and performance	1-Jun-16		1-Jun-16		Schlifer

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Quarterly Activities						
2016QR1	Submittal of quarterly activities	30-Jan-16		30-Jan-16		All LTRM staff
2016QR2	Submittal of quarterly activities	13-Apr-16		13-Apr-16		All LTRM staff
2016QR3	Submittal of quarterly activities	13-Jul-16				All LTRM staff
2016QR4	Submittal of quarterly activities	12-Oct-16				All LTRM staff
Equipment Inventory						
2016ER1	Property inventory and tracking	15-Nov-16				LTRM staff as needed

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Developing and Applying Indicators of Ecosystem Resilience to the UMRS						
2016R1	Updates provided at each quarterly UMRR-CC meeting and A team meeting	Various				Bouska, Houser
2016R2	Initial meeting of full Resilience Working Group	1-Oct-15		5-Jan-16		Bouska, Houser
2016R3	Draft conceptual model	30-May-16		30-May-16		Bouska, Houser
Landscape Pattern Research and Application						
2016L1	Draft Manuscript: Changes in land cover and land use 2000-2010.	30-Sep-16				De Jager & Rohweder (UMESC)
2016L2	Draft Manuscript: Effects of flooding, invasion by reed canarygrass, and increased nitrogen deposition on decomposition and nitrogen cycling along the UMR Floodplain	30-Sep-16				Swanson, Strauss, Thomsen (UW-L) &
2016L3	Draft Manuscript: Review of Landscape Ecology on the UMR	30-Sep-16				De Jager (UMESC)
2016L4	Draft Manuscript: Reed canarygrass abundance and distribution in the UMR.	30-Sep-16				Miller & Thomson (UW-L), De Jager and Yin (UMESC)
2016L5	Draft Manuscript: Linking flood inundation, ecosystem functions, and ecosystem services: the state of the art.	30-Sep-16				De Jager (UMESC), Morlock (USGS), Johnson (TNC)
2016L6	Data Analysis and Presentation: Spatial patterns of the invasive faucet snail Bithynia tentaculata in Pool 8 of the UMR	30-Sep-16				Weeks & Haro (UW-L), De Jager (UMESC)
On-Going						
2015L6	Presentation: Developing methods to map floodplain functions and ecosystem services	30-Jul-16				Morlock (USGS), Van Appledorn, De Jager
2015L6a	Draft Manuscript: Developing methods to map floodplain functions and ecosystem services	30-Sep-16				Morlock (USGS), Van Appledorn, De Jager
Intended for distribution						
Manuscript: De Jager, N.R., Swanson, W., Strauss, E.A., Thomsen, M., Yin, Y. Flood pulse effects on nitrification in a floodplain forest impacted by herbivory, invasion, and restoration. Wetlands Ecology and Management. (2014L1). (Completed DOI 10.1007/s11273-015-9445-z)						
Manuscript: De Jager, N.R., Houser, J.N., Ickes, B.S. Patchiness in a large floodplain river: associations among hydrology, nutrients, and fish communities. River Research and Applications. (2014L3) (in USGS Review)						
Fact Sheet: De Jager, N.R. 2014. Landscape Ecology on the Upper Mississippi River: lessons learned, challenges, opportunities (2013L3). (Completed; https://pubs.er.usgs.gov/publication/fs20163007)						
Manuscript: De Jager, N.R., Rohweder, J., Yin, Y., Hoy, E. 2015. The Upper Mississippi River floodscape: spatial patterns of flood inundation and associated plant community distributions. Applied Vegetation Science (2015L2). (Completed doi: 10.1111/avsc.12189)						
Manuscript: Kreiling, R.M., De Jager, N.R., Swanson, W., Strauss, E.A., Thomsen, M. 2015. Effects of flooding on ion exchange rates in an Upper Mississippi River floodplain forest impacted by herbivory, invasion, and restoration. Wetlands (2015L3). (in USGS Review)						
Manuscript: Scown, M., Thoms, M. and De Jager, N. R. 'Measuring spatial pattern in floodplains: A step towards understanding the complexity of floodplain ecosystems'. In Press: *River Science: Research and Applications for the 21st Century* . D. J. Gilvear, M. Greenwood, M. Thoms and P. Wood (eds). John Wiley and Sons, UK (2015L7)						
Manuscript: Scown, M. W., Thoms, M. C. and De Jager, N. R. The effects of survey technique and vegetation type on measuring floodplain topography from DEMs. Earth Surface Processes and Landforms. (2015L8) (in USGS Review)						
Manuscript: Scown, M. W., Thoms, M. C. and De Jager, N. R. An index of floodplain surface complexity. Hydrology and Earth Systems Science. (2015L11). (in USGS Review)						

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Mussel Research Framework						
2015MRF1	Spatial patterns of native mussels in the UMRS: Establish selection criteria, identify existing data sets, and re-format to a common data suitable for spatial analysis	1-Apr-16		1-Apr-16		Ries, Newton, De Jager, Zigler
2015MRF22	Spatial patterns of native mussels in the UMRS: brief summary letter, including complied dataset, GIS layers, map	1-Jun-16			In lieu of summary letter a presentation will be given to the LTRM Mgt. Team	Ries, Newton, De Jager, Zigler
Intended for distribution						
Manuscript: Reis, P., De Jager, N.R., Newton, T., Ziegler, S. Spatial patterns of native freshwater mussels in the UMR. Freshwater Science. (in USGS Review)						
Pool 12 Overwintering HREP Adaptive Management Fisheries Response Monitoring						
2016P13a	Collect annual increment of pool-wide electrofishing data	1-Nov-15		1-Nov-15		Bierman and Bowler
2016P13b	Collect annual increment of fyke netting data from backwater lakes	15-Nov-15		15-Nov-15		Bierman and Bowler
2016P13c	Perform otolith extraction from bluegills for aging	1-Dec-15		1-Dec-15		Bierman and Bowler
2016P13d	Age determination of bluegills collected in Fall 2015	1-Feb-16		1-Feb-16		Bierman and Bowler
2016P13e	In-house project databases updated	31-Mar-16		31-Mar-16		Bierman and Bowler
2016P13f	Summary report compiled and made available to program partners	30-Sep-16				Bierman and Bowler
Statistical Evaluation						
2016E1	Draft manuscript: Trends in summer water temperatures in the LTRM study reaches	30-Sep-16		30-Mar-16	Submitted to Hydrological Processes	Gray
2016E2	How well do trends in LTRM percent frequency of occurrence SAV statistics track trends in true occurrence?	30-Sep-16				Gray, Erickson
Intended for distribution						
Completion report that describes methods of estimating variance components from LTRMP water quality data (2008E1; Gray) (In USGS review)						
Manuscript: Inferring decreases in among- backwater heterogeneity in large rivers using among-backwater variation in limnological variables (2010E1, Rogala, Gray, Houser) (In USGS review)						
Completion Report: Summer water temperature in the Upper Mississippi River (2012E2). Gray, Robertson, Houser, Rogala. Completed						
Completion report: An assessment of trends in water temperature in La Grange Pool (2012E3; Gray, Robertson, Rogala, Houser) Completed						
Aquatic Vegetation Component						
2016A6	Analysis: Aquatic Plant Response to Large-Scale Island Construction in the Upper Mississippi River.	30-May-16		30-May-16		Drake and Gray
2016A6a	Draft manuscript: Aquatic Plant Response to Large-Scale Island Construction in the Upper Mississippi River.	30-Sep-16				Drake and Gray
2016A7	Draft completion report: How many years did the effects of the 2001-2002 Pool 8 drawdown on arrowheads (*Sagittaria latifolia* and *S. rigida*) last?	30-May-16	30-Sep-16			Yin
On-Going						
2015A7	Data compilation and analysis: Aquatic macrophyte communities and their potential lag time in response to changes in physical and chemical variables	30-Jun-16				Moore
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-17				Moore

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Fisheries Component						
2016B12	Draft Manuscript: Benefits of Collaboration among Long Term Fish Monitoring Programs in Large Rivers (Fisheries Journal)	31-Dec-15		22-Oct-15	Reconciled peer review comments and resubmitted to journal for publication, 7/15/2016	Counihan, Ickes, Casper, Sauer
2016B13	Draft Manuscript: An Assessment of Long Term Changes in Fish Communities within Large Rivers of the United States (Environmental Monitoring journal)	31-Dec-15		7-Dec-15	Not accepted by Environmental Monitoring; being revised for submission to another Journal.	Counihan, Ickes, Casper, Sauer
2016B14	Draft completion report: Exploring Years with Low Total Catch of Fishes in Pool 26	30-Sep-16				Gittinger, Ratcliff, Lubinski, Chick
2016B15	Summary letter: Technical Support to River Managers Investigating UMR Walleye Dynamics	30-Sep-16				Andy Bartels, Kraig Hoff, Fish Managers from WI, MN, and IA
On-Going						
2015B5	Letter summary: Exploring years with low total catch of fishes in Pool 26	15-Nov-15	31-Jul-16			Gittinger, Ratcliff, Lubinski, Chick
2015B17	Draft Manuscript: Fish Trajectory Analysis	30-Sep-16				Ickes, Minchin
2014B10	Presentations, draft completion report: Paddlefish population characteristics in the Mississippi river Basin	1-Dec-15		1-Dec-15	Manuscript in review in Fisheries	Hupfeld, Phelps
2006B6	Draft manuscript: Spatial structure and temporal variation of fish communities in the Upper Mississippi River. (Dependent on 2008B9 acceptance into journal)	30-Sep-15	30-Sep-16			Chick
2008B9	Draft manuscript: Standardized CPUE data from multiple gears for community level analysis (a previous manuscript was submitted and not accepted by the journal, 2006B5; 2008B9 is a revised manuscript) (Chick)	15-Dec-15		21-Dec-15		Chick
Water Quality Component						
2016D17	Draft manuscript: Relationship between the temporal and spatial distribution, abundance, and composition of zooplankton taxa and hydrological and limnological variables in Lake Pepin (Reformatting for submission to River Research and Applications)	30-Sep-16				Burdis
On-Going						
2015D13	Initial analysis and draft manuscript: Coherence in temporal variation of select water quality parameters across strata and study reaches	1-Sep-16				Houser
2015D14	Draft manuscript: Coherence in temporal variation of select water quality parameters across strata and study reaches	1-Sep-17				Houser
2015D15	Analysis of Lake Pepin rotifers; data from 2012-2014	30-Mar-16	30-Sep-16			Burdis
2015D16	Draft manuscript: Trends in water quality and biota in segments of Pool 4, above and below Lake Pepin	31-Dec-15	31-Dec-16			Burdis
2014D13	Presentations, draft completion report: A Comparison of Side and Main Channel Fish Community and Water Quality Characteristics	1-Dec-15		25-Feb-16		Sobotka, West, Phelps

Tracking number	Milestone	Original Target Date	Modified Target Date	Date Completed	Comments	Lead
Development of 2010–2011 Land Cover/Land Use GIS Database and Aerial Photo Mosaics						
2015V1	Complete 2010/11 LCU database for UMR Pools 1, 2, 11, 15-17, the Illinois River's Lockport, Brandon, and Dresden Pools, and the Lower Minnesota, Lower St. Croix, and Lower Kaskaskia Rivers.	31-Aug-15		31-Aug-15	Data in review	Robinson, Hoy, Hanson, , Ruhser, Nelson, Jakusz
USACE UMRR LTRM Technical Support						
2016COE1	Quarterly update submitted to the LTRM Management Team	30-Dec-15				McCain, Theiling, Potter
2016COE2	Quarterly update submitted to the LTRM Management Team	30-Mar-16				McCain, Theiling, Potter
2016COE3	Quarterly update submitted to the LTRM Management Team	30-Jun-16				McCain, Theiling, Potter
2016COE4	Quarterly update submitted to the LTRM Management Team	30-Sep-16				McCain, Theiling, Potter
Science Coordination Meeting						
2016N1	Science Planning Meeting	Feb. 2016		Feb. 2016		Houser, Sauer, Lowenberg, Hubbell, and Hagerty
A-Team and UMRR-CC Participation On-going						
Spatial Patterns of native mussels in the UMRS						
2016MRF1	Draft Completion report: Spatial patterns of native mussels in the UMRS	15-Sep-17				Ries, Newton, De Jager, Zigler
2016MRF2	Final completions report: Spatial patterns of native mussels in the UMRS	15-Nov-17				Ries, Newton, De Jager, Zigler
Pool 12 Overwintering HREP Adaptive Management Fisheries Response Monitoring – Pre-construction Biological Response Monitoring; Crappie Telemetry –Kehough Lake						
2016AM1	Capture fish and affix radio tags to white crappies in study lakes	1-Nov-15	1-Nov-15			Bierman, Hansen, Bowler, Theiling
2016AM2	Location of tagged fish and update in-house project database	Ongoing through FY				Bierman, Hansen, Bowler, Theiling
2016AM3	Complete tracking portion of study	30-Sep-16				Bierman, Hansen, Bowler, Theiling
2016AM4	Summary report: Analysis of tracking data and quantification of 80% UDs for Stone, Tippy, and Green lakes	30-Sep-16				Bierman, Hansen, Bowler, Theiling
2016AM5	Summary report: Analysis of tracking data and quantification of 80% UDs for Kehough lake	30-Sep-17				Bierman, Hansen, Bowler, Theiling
Understanding biological shifts in the UMR due to invasion by *Potamogeton crispus*						
2016PC1	Summary letter on FY16 work	30-Sep-16				Drake, Giblin, Nissen, Kalas
2016PC2	Draft manuscript: Understanding biological shifts in the UMR due to invasion by *Potamogeton crispus*	1-Jun-17				Drake, Giblin, Nissen, Kalas
Developing and applying trajectory analysis methods for UMRR Status and Trends indicators – Year 2						
2016B14	Data assembly	30-May-16		14-Jan-16		Ickes, Minchin
2016B15	Model functional trajectory	30-Sep-16		25-Feb-16		Ickes, Minchin
2016B16	Summary letter	31-Oct-16			In lieu of summary letter a presentation will be given to the LTRM Mgt. Team	Ickes, Minchin
2016B17	Draft Manuscript	31-Oct-17				Ickes, Minchin

ATTACHMENT E

Additional Items

- **Future Meeting Schedule** *(E-1)*
- **Frequently Used Acronyms (5/9/2016)** *(E-2 to E-8)*
- **UMRR Authorization, As Amended (1/27/15)** *(E-9 to E-12)*
- **UMRR (EMP) Operating Approach (5/06)** *(E-13)*

QUARTERLY MEETINGS
FUTURE MEETING SCHEDULE

NOVEMBER 2016	
St. Paul, Minnesota	
November 14	UMRBA WQEC Meeting
November 15	UMRBA Quarterly Meeting
November 16	UMRR Coordinating Committee Quarterly Meeting

FEBRUARY 2017	
Rock Island, Illinois	
February 7	UMRBA Quarterly Meeting
February 8	UMRR Coordinating Committee Quarterly Meeting

Acronyms Frequently Used on the Upper Mississippi River

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
HQUSACE	Headquarters, USACE
H.R.	House of Representatives
HREP	Habitat Rehabilitation and Enhancement Project
HU	Habitat Unit
HUC	Hydrologic Unit Code
IBA	Important Bird Area
IBI	Index of Biological (Biotic) Integrity
IC	Incident Commander
ICS	Incident Command System
ICWP	Interstate Council on Water Policy
IDIQ	Indefinite Delivery/Indefinite Quantity
IEPR	Independent External Peer Review
IIA	Implementation Issues Assessment
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
LTRMP	Long Term Resource Monitoring Program
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
OHWM	Ordinary High Water Mark
OMB	Office of Management and Budget
OMRR&R	Operation, Maintenance, Repair, Rehabilitation, and Replacement
OPA	Oil Pollution Act of 1990
ORSANCO	Ohio River Valley Water Sanitation Commission
OSC	On-Scene Coordinator
OSE	Other Social Effects
OSIT	On Site Inspection Team
P3	Public-Private Partnerships
PA	Programmatic Agreement
PAS	Planning Assistance to States
P&G	Principles and Guidelines
P&R	Principles and Requirements
P&S	Plans and Specifications
P&S	Principles and Standards
PCA	Pollution Control Agency
PCA	Project Cooperation Agreement
PCX	Planning Center of Expertise
PDT	Project Delivery Team
PED	Preliminary Engineering and Design
PgMP	Program Management Plan
PILT	Payments In Lieu of Taxes
PIR	Project Implementation Report
PL	Public Law
PMP	Project Management Plan
PORT	Public Outreach Team
PPA	Project Partnership Agreement
PPT	Program Planning Team
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RCP	Regional Contingency Plan
RCPP	Regional Conservation Partnership Program
RDB	Right Descending Bank
RED	Regional Economic Development
RIFO	Rock Island Field Office
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
UMRSHNC	Upper Mississippi River Sub-basin Hypoxia Nutrient Committee
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

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.