Upper Mississippi River Restoration Program Coordinating Committee
Quarterly Meeting
October 30, 2019

Highlights and Action Items

Program Management

- Marshall Plumley and Karen Hagerty visited the UMRR LTRM Illinois River Biological Field station in Havana, IL and plan to visit the Great Rivers (Alton, IL) and Big Rivers and Wetlands (Cape Girardeau, MO) Field Stations December 17-18, 2019. [Note: This was cancelled due to the weather]. He also attended the recent A-Team, FWIC and RRCT meetings in-person and engaged with other river teams via conference call. Plumley and Karen Hagerty attended the Upper Mississippi River Conference and set up an information booth on the UMRR program.

- Plumley attended a meeting on October 10 hosted by Senator Dick Durbin (D-IL) to field questions regarding how the proposed Quincy Bay habitat project fits within the UMRR HREP selection process. Plumley explained the program’s deliberate process to identify suitable habitat restoration projects over a large geographic scope and said that representatives from Quincy Bay Area Restoration and Enhancement Association and other NGOs have been involved in the conversations.

- UMRR achieved an execution rate of 99 percent in FY 19, obligating $32.89 million dollars, excluding FY 18 carryover. Contingency planning allowed funds to be shifted between districts and across program elements. Plumley said the program’s ability to obligate dollars in a difficult year with a government shutdown and prolonged flooding was noticed by decision makers. He applauded the partners’ flexibility and willingness to engage quickly to ensure the program’s success and obligation of funds.

- Major accomplishments in FY 19 include 23 HREPs in planning, design, or construction, awarding two construction contracts, hosting the May 2019 HREP workshop that helped support integration of program elements, continued LTRM monitoring, and numerous congressional and public engagements. The program also initiated four new science in support of restoration projects, updates to the 2010 land use/land cover dataset, the Lower Illinois River communications pilot project, and Illinois Waterway consolidated closure monitoring efforts.

- On September 26, 2019, Congress passed a continuing resolution authority (CRA) for FY 20 that expires on November 21, 2019. District staff are authorized to execute the program at $33.17 million. The House Appropriations Committee and the Senate Energy and Water Appropriations Subcommittee both approved $33.17 million for the UMRR program in their respective FY 20 energy and water appropriations measures.

- At the $33.17 million planning scenario, UMRR’s FY 20 internal allocations are as follows:
  - Regional Administration and Program Efforts – $1,250,000
  - Regional Science and Monitoring – $10,500,000
    - Long term resource monitoring – $5,000,000
    - Regional science in support of restoration – $3,800,000
    - Regional science staff support – $200,000
    - Habitat project evaluations – $1,125,000
    - HNA II/regional project sequencing – $375,000
• Habitat Restoration – $21,420,000
  o Rock Island District – $7,280,000
  o St. Louis District – $6,940,000
  o St. Paul District – $7,100,000
  o Model certification – $100,000

• UMRR initiatives for FY 20 include developing statements of significance, defining a desired future condition for the UMRS, drafting the third UMRR LTRM Status and Trends report, conducting a progress review of the 2015-2025 Strategic Plan, and planning the development of the 2022 Report to Congress.

• Plumley provided a 10-year outlook through FY 30 that incorporates currently scheduled HREPs, monitoring, adaptive management, and science activities, based on recent funding trends. This information is helpful in understanding where projects identified as part of the ongoing HREP selection process may fit in to FY 21-25.

• The UMRR Coordinating Committee is scheduled to convene a November 14, 2019 conference call regarding development of statements of significance. [Note: Following the meeting, the call was rescheduled for November 26, 2019.] On the call, Committee members will discuss their perspectives of UMRS significance. This is a first step in a structured approach to defining a desired future condition for the UMRS. Jim Fischer suggested partnering with the UMRBA Board to develop statements of UMRS significance.

• The Lower Illinois River communications pilot ad hoc team is currently reviewing a draft communications plan framework, including a problem statement, goal, objectives, and key messages. In addition, team members are providing their input regarding UMRR’s strengths, weaknesses, opportunities, and threats as related to this effort as well as key target audiences and partners who may help UMRR connect with these audiences.

• Communication and outreach activities in the fourth quarter of FY 19 include the following.
  — On October 3, 2019, Minnesota state legislators held a field hearing on the river near Winona. Megan Moore presented on climate change using LTRM data and provided handouts on LTRM.
  — The Corps’ St. Louis District’s Operations Division held a career event for high school seniors on October 16, 2019 at Mel Price Lock and Dam. Brandon Schneiders (fisheries) and Jasen Brown (engineering) were present to answer questions.
  — Representatives from the USGS ecosystem mission area visited UMESC in early September 2019 and were briefed on LTRM components.
  — A photojournalist toured the river with Deanne Drake (WI DNR) in late September 2019. The photojournalist expressed interest in featuring the Mississippi River in National Wildlife Magazine in March 2020.
  — Col. Steve Sattinger, Mark Wiltermuth, and Jennie Sauer attended MRCTI’s annual meeting on September 17-19, 2019. Sauer distributed UMRR business cards at the meeting.

UMRR Showcase Presentation

• The Corps is considering possible funding mechanisms for repairing damages on completed habitat projects resulting from the 2019 flood. HREP District Managers explained the challenges of this year’s high water on HREPs. Projects impacted include Harpers Slough, Pool 12 Overwintering,
Huron Island Stage II, Beaver Island, Lake Odessa, and Batchtown. Prolonged high water also damaged trees at the Ted Shanks, causing a one-year delay of the project’s close out.

• Eric Lund provided a summary of research exploring environmental effects on macrophyte prevalence in Pool 4 by season. Pool 4 has experienced high variability with regard to water quality, water levels, and annual submersed macrophyte occurrence. The research concluded that annual change in SAV occurrence is influenced by specific hydrological conditions during current and or prior summers. SAV occurrence increases under low discharge during summer of a given year and prior year. SAV occurrence declines under high discharge during summer of the year prior to data collection.

**Habitat Restoration**

• Feasibility studies for Lower Pool 10 and Reno Bottoms HREPs are ongoing in MVP. A task order is being used to design McGregor Lake by April 2020. Construction contracts for Bass Ponds and McGregor Lake are anticipated in the second and third quarters of FY 20, respectively. MVP is working with channel maintenance to determine if dredge material from McMillan Island dredge cuts can be placed at McGregor Lake, which would result in a cost savings of approximately $3 million. Conway Lake will begin construction in FY 20. Repairs to address island erosion at Harper’s Slough are proposed.

• MVR’s planning priorities include Steamboat Island and Lower Pool 13, and anticipates initiating planning on Green Island this calendar year. Design work continues on all project features for Keithsburg Division. High water continued to delay progress on Pool 12 Overwintering, Huron Island Stages II and III, and Keithsburg Division Stage I. Contactors are resuming work at Beaver Island.

• MVS is completing alternatives for Oakwood Bottoms and will be meeting with MVD in November 2019 to discuss results. The feasibility report is being drafted for Yorkinut Slough, and planning efforts on Hamburg Island have been delayed due to other demands in the district. A design contract for Crains Island is anticipated for the second quarter of FY 20. MVS is working with the Piasa and Eagles Nest Islands sponsor to complete the design phase. The District is looking to award a construction contract for Crains Island in FY 20. Construction continues at Clarence Cannon on water control structures including measures to address damage from flooding. Repairs at Ted Shanks are nearly complete.

• The FWWG has identified four projects to develop into fact sheets and are on schedule to make recommendations to the UMRR Coordinating Committee in spring 2019.

• The FWIC developed eight fact sheets and will use a criteria matrix based on HNA-II indicators and paired comparison process to rank projects. FWIC voting members are scheduled to meet on November 5, 2019 to review rankings and finalize recommendations to submit to the RRCT on November 12, 2019.

• The RRAT identified 12 fact sheets for consideration and will also use a matrix with the 12 HNA-II indicators to help prioritize projects. The RRAT-Exec envisions tiered recommendations with three to five Tier 1 projects being submitted to the PPT and UMRR Coordinating Committee.

• The PPT will have a call in January 2020 to chart out a strategy for review and approval of projects at the UMRR Coordinating Committee’s February or May 2020 quarterly meeting.
**Long Term Resource Monitoring and Science**


- The UMRS systemic spatial data viewer has been updated. The online viewer hosts a variety of spatial data including historic and present land cover data, level two and three aquatic areas, HREPs and pool boundaries, and UMRS floodplain inundation attributes. The updated viewer can be accessed at [https://umesc.usgs.gov/management/dss/umrs_land_cover_viewer.html](https://umesc.usgs.gov/management/dss/umrs_land_cover_viewer.html).

- The LTRM spatial data query tool has been updated with LTRM water quality, vegetation, and fish data through 2018. The tool also contains land cover and bathymetric data. The tool can be found at [https://umesc.usgs.gov/ltrmp/spatial_data_query_tool.html](https://umesc.usgs.gov/ltrmp/spatial_data_query_tool.html).

- The UMRR resilience research framework has been reviewed by the Resilience Working Group and the A-Team and will be available online at [https://umesc.usgs.gov/ltrmp/ateam.html](https://umesc.usgs.gov/ltrmp/ateam.html). The framework outlines research that would continue to improve understanding of ecological resilience of UMRS and inform management of the system for health and resilience.

- Historic aerial photos of the UMRS have been scanned and will be available through ScienceBase. Individual photos will be posted, and next steps include georeferencing and orthorectification to generate pool-wide mosaics.

- The chapters and indicators included in the draft outline of the third status and trends report are being revised to reflect feedback from the A-Team. Writing and analysis will be completed during FY 20. A summary of the report will be included in the 2022 report to Congress.

- **The UMRR science meeting is scheduled for January 14-16, 2020 in La Crosse.** The format will be similar to the 2018 science meeting, and focus on assessing current information needs for the understanding, management, and restoration of the UMRS and developing proposals for research using 2020 funds. Working groups at the meeting will consider what the river will look like in 50-100 years, the distribution and abundance of habitat and biota as well as the restoration and management implications. A conference call will be held November 6, 2019 to discuss the science meeting focal areas. [Note: Following the meeting, the call was rescheduled to November 14, 2019.]

- UMRR’s FY 20 LTRM allocation under full funding includes $6.3 million ($5.0 million for base monitoring and $1.3 million for analysis). An additional $2.5 million is available for science in support of restoration and management. These funds will cover monitoring during the Illinois Waterway closure, development of wind fetch products, moving LTRM spatial data to web mapping services, continuing ecohydrology work, and reintroducing chloride monitoring for three years (2020-2023) to allow comparisons to historic data and establish change over time.

- The A-Team met in-person in Dubuque on October 17, 2019. The meeting agenda included a UMRR update from Karen Hagerty on behalf of Marshall Plumley, planning for the 2020 science meeting, and discussion of the third UMRR LTRM Status and Trends report. The A-Team conducted a point by point review of the planned 2020 Science Meeting focal areas to ensure critical areas of research are identified and represented. The A-Team also reviewed and discussed the merits of various indicators for the draft chapter outlines of the third UMRR LTRM Status and Trends report, ultimately recommending a number of changes. Proposed changes included adding a dredge material indicator to evaluate changes in dredge material over time, incorporating seasonality for appropriate indicators, evaluating indicators for overwintering habitat, duckweed and filamentous algae, recreational and commercial fish, forage fish, and flow normalized representation of water quality indicators. The A-Team unanimously approved the amended list of indicators.
Other Business

- Sabrina Chandler announced that DOI will be switching to Office 365 in the coming months.

- Andrew Stephenson recalled a discussion on identifying possible data repositories that could be used by all partners. ProjectWise was noted as a possible option that is currently used by the Corps, however, licenses are required. A discussion of potential solutions will be presented at the UMRR Coordinating Committee’s February 2020 quarterly meeting.

Upcoming quarterly meetings are as follows:

- **February 2020 – Moline**
  - UMRBA quarterly meeting – February 25
  - UMRR Coordinating Committee quarterly meeting – February 26

- **May 2020 – St. Louis**
  - UMRBA quarterly meeting – May 19
  - UMRR Coordinating Committee quarterly meeting – May 20

- **August 2020 – La Crosse**
  - UMRBA quarterly meeting – August 11
  - UMRR Coordinating Committee quarterly meeting – August 12
UMRR COORDINATING COMMITTEE - REGIONAL MANAGEMENT AND PARTNERSHIP COLLABORATION
Marshall Plumley
Regional Program Manager
St. Paul District
Rock Island District
St. Louis District
30 October 2019

UMRR PROGRAM OVERVIEW
- FY 2019 Fiscal Update and FY 20 Outlook
- Statements of UMRR National Significance
- UMRR Communication Pilot Project
- External Communications and Outreach Events

STRENGTHS
First large river ecosystem restoration and scientific monitoring program in nation.
Value of a multi-layered and diverse Regional Partnership.
Value of a program that integrates science and monitoring with program management and implementation.
Restoring and protecting the world’s 3rd largest river system.
A healthier and more resilient Upper Mississippi River ecosystem that sustains the River’s multiple uses.

UPPER MISSISSIPPI RIVER RESTORATION PROGRAM OVERVIEW

FINANCIAL REPORTING

FINANCIAL REPORTING
**FINANCIAL REPORTING**

**FY19 PLAN OF WORK**

**Budget**

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<td>Regional Management</td>
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<td>Habitat Evaluation (split between MVS, MVR, MVP)</td>
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**FY19 ACCOMPLISHMENTS**

- Continued work on 23 HREPs
- Completed 5 HREP Feasibility Studies
- Awarded 2 Construction Contracts
- Continued Construction on 6 HREPs
- HREP Workshop
- Initiated 4 Science in Support of Restoration Projects
- Initiated Land Use/Land Cover Update
- Illinois Waterway Consolidated Closures Monitoring
- LTRM Monitoring (6 Field Stations, 5 States, 1300 miles of River)
- Numerous Congressional and Public Engagements
- Communications Plan momentum

**FY20 PLAN OF WORK**

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**FY20 PBUD**

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FY20 INITIATIVES

- Significance
- Desired Future Conditions
- Status and Trends
- 2015 – 2025 Strategic Plan Review
- 2022 Report to Congress

UMRR PROGRAM
APPROPRIATION/BUDGET HISTORY

FY1985 to FY2019

UMRR TEN YEAR PLAN

UMRR TEN YEAR PLAN

UMRR TEN YEAR PLAN

ACRES RESTORED

2019-2030
11 Years
65,180 Potential Acres Restored

FY1985 to FY2030
RESOURCE SIGNIFICANCE

- Conference Call 14 November

EXTERNAL COMMUNICATIONS & OUTREACH EVENTS
UMRR Lower Illinois River Communication Pilot Project

ANDREW STEPHENSON
UMRR COORDINATING COMMITTEE QUARTERLY MEETING
AUGUST 21, 2019

UMRR Goals
1) Enhance habitat for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem.
2) Advance knowledge for restoring and maintaining a healthier and more resilient Upper Mississippi River Ecosystem
3) Engage and collaborate with other organizations and individuals to help accomplish the UMRR Program vision
4) Utilize a strong, integrated partnership to accomplish the Upper Mississippi River restoration vision.

UMRR 2015-2025 Strategic Plan
• Work with key organizations and individuals in the Upper Mississippi River watershed.
• Provide information to organizations and individuals whose actions and decisions affect the Upper Mississippi River ecosystem.
• Exchange knowledge with other organizations and individuals nationally and internationally

Roadmap
Review plan origination
October 16 call
Next steps

Results of multivariate cluster analyses of all 12 Indicators (HNA-II)

Communication Pilot Project
Problem statement
TSS concentrations within the Lower Illinois River reduce the ability of the system to support growth of native aquatic vegetation and other food and habitat resources for fish and waterfowl species as well as continuing to degrade backwater and off-channel habitat. TSS concentrations will not improve without actions taken within the watershed or tributaries outside the scope of UMRR.
Communication Pilot Project

Goal
Engage organizations and individuals within the Lower Illinois River watershed who can address external stressors outside the jurisdiction of UMRR to improve the health and resilience of the river by reducing TSS inputs from the watershed.

Objectives

Reduce TSS inputs to Lower Illinois River
Create new relationships with organizations and individuals in the Lower Illinois River watershed
Integrate water quality monitoring and knowledge in the watershed with LTRM datasets
Integrate restoration and conservation practices on main stem with incoming tributaries

October Communication Meeting 10/16/19

Conference call 10/16/19
• Reflections on problem statement, goal statement, and objectives
• SWOT exercise
• Stakeholder interest and influence over sediment
• Communication channels
• Key messages

SWOT

S | W | O | T
--- | --- | --- | ---
High knowledge of issue’s impact to river, history | Authorization restricts activities in watershed | Support existing partner’s initiatives such as NRCS – MRBL, NRCS – RCP | Annual appropriations
Established program with national profile | Complex issue, history | Opportunity to build new relationships with stakeholders and agencies |
Existing appropriation, currently doing such | Limited budget and staff capacity |
Money partners, groups working with public | Perception as “outsiders” |
Dredging data and activities showing temporal trends of sediment | Real estate—the IL watershed has fewer federal lands than other areas in the Upper Miss. Private land ownership, lack of public land |
Bathymetric data? | Needed for monitoring with fixed site sampling since 1991 and with stratified random sampling since 1993 |

Potential Partners

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<th>Stakeholder Group</th>
<th>Degree of Interest in Sediment (H, M, L)</th>
<th>Degree of Influence over Sediment (H, M, L)</th>
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<tbody>
<tr>
<td>MRCL, Ivan Dozier</td>
<td>H</td>
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<td>NAWCC (Tri-Chairs, Nate De Jager, Sara Schmidt), Matt McClain</td>
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<td>L</td>
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<tr>
<td>Illinois EPA, John Criese, Matthew Short</td>
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<td>IDGS – Central Midwest Water Science Center, Nutrient and Sediment Interactions Section, Tim Ismeal</td>
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<td>IDGS – USGS, Jeff Houser, Nate De Jager, Kathleen Jackowski</td>
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<td>M</td>
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<td>Prairie Rivers Network, Jeff Rohmstedt</td>
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<td>Illinois DNR, Scott Morris</td>
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Target Audiences

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<th>Degree of Influence over Sediment (H, M, L)</th>
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<td>Existing Watershed projects</td>
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<td>M/N</td>
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<td>Local Co-ops</td>
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<td>Illinois Farm Bureau</td>
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<td>Watershed Councils (Peoria, Springfield, Decatur, and Bloomington)</td>
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<td>Illinois Land Improvement Contractors Association</td>
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<td>Illinois Corn Growers</td>
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Communication Channels

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<th>Stakeholder Group</th>
<th>Message</th>
<th>Activity/Event</th>
<th>Materials</th>
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<tbody>
<tr>
<td>Conservation Districts</td>
<td>Resource conservationist</td>
<td>UMRR does not have oversight of lands, but we do have this data that may be able to help. Could help get more dollars for national level funds from NRCS.</td>
<td>one-on-one phone call with each watershed coordinator</td>
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Key Messages

1) HNA-II can help establish need for prioritization of restoration in the Lower Illinois River

2) Monitoring data can help show impact of restoration activities

Supporting Messages

**Drafted:**
UMRR Program – Leading, Innovating, Partnering
What are Total Suspended Solids (TSS)?
Sediment is the problem

**To Draft:**
Addressing the problem
Resilience as a result
Economic Benefits
Benefits to Partners

Existing Initiatives

**NRCS:**
- Mississippi River Basin Healthy Watershed Initiative (MRBI) - Upper Macoupin Creek Watershed Partnership
- Regional Conservation Partnership Program

Illinois River Basin Restoration Comprehensive Plan
Next Steps

Review document and provide input by November 8, 2019

- SWOT analysis
- Target audience
- Potential Partners
- Communication channels table

Packaging UMRR Data Sources

Andrew Stephenson
Astephenson@umbra.org
612-224-2880
PROGRAM REPORTS

Marshall Plumley
Regional Program Manager
Mississippi Valley – St. Paul District
Mississippi Valley – Rock Island District
Mississippi Valley – St. Louis District
30 October 2019

2019 FLOOD DAMAGES

MVP – Harpers Slough
MVR – Pool 12 Overwintering, Princeton WMA, Beaver Island, Lake Odessa, Huron Island
MVS - Batchtown

UMRR – PROJECT REPAIRS:
HARPERS SLOUGH HREP
St. Paul District
Tom Novak
Angela Deen

HARPERS SLOUGH HREP
Upper Mississippi River
– Pool 9, Iowa
– 100 acres of islands (new & existing)
– $12M
– Completed in 2017
2 Islands Damaged by Flood Events
– Island M2
– Island W2

TIMELINE

2017
– Physical Work Completed (29 Sep 2017)
– Seeded late - partially established (8 Nov 2017)

2018
– Spring/Summer: extended high water, wave action & overtopped islands
– Fall inspection:
  600 ft. of erosion on Island M2
  Seeded areas could not get fully established

2019
– Record flows, extensive erosion
  – Island M2, Island W2 compromised, breaches allowing flows into backwater dredged cuts and wetland areas
  – Volunteer vegetation died

ISLAND W2
– 2,000 ft. of erosion
– Large breach, approximately Sta 11+00
BEFORE & AFTER (ISLAND W2)

2017

2018

2019

PROPOSED REPAIRS

Island W2 example:
– Extend rock sills, rebuild damaged island portions

Next Steps:
– Surveys after Closed Area lifted

ISLAND M2
– Island M2 – high water and overtopping removed 400 ft. of island
– Breach is 20 ft. wide (growing) breach
– Flow currently going through island into emergent wetland
– M2 wetland berm is also breached

REPAIRS NEEDED TO ACHIEVE BENEFITS

2019 FLOOD DAMAGES

UMRR – 2019 HREP FLOOD DAMAGES: ROCK ISLAND DISTRICT

Rock Island District

Pool 12 Overwintering, Pool 12, IL
– Channels were surveyed after high water
– Trees were surveyed in July 2019
– No correlation between tree survivability and elevation was observed
– Kentucky coffee tree has best growth and survivability
– Heavy damage from beavers occurred
– Sunfish lost majority to all of the 3 gallons stock planted trees

Princeton Wildlife Management Area, Pool 14, IA
– Engineering was on-site July 30th
– Minor landslide slope erosion in the south cell adjacent to the river
– Overtopping damage at the upstream end in the north cell along the creek, see photo
– Survey of damaged areas is scheduled for this fall

Survival Count per Area

<table>
<thead>
<tr>
<th>Project Location</th>
<th>Tree Type</th>
<th>Event Site</th>
<th>Percent Tree Site</th>
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<tbody>
<tr>
<td>Princeton</td>
<td>Sunfish</td>
<td>40%</td>
<td>40%</td>
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</table>
2019 FLOOD DAMAGES

Beaver Island IB, Pool 14, IA
- Additional riprap was required for the closure structure. Some scouring occurred on a low part downstream of the structure (Mod).
- The channels had scourcd since design surveys had been completed. This meant there was not enough material to construct the topographic diversity sites. Two mods were required to ensure sufficient material was present.
- The navigation side of Albany Slough bankline eroded more during this past high water, which required a modification for additional rock. Another modification may occur to extend the rock protection location.

Lake Odessa, Pool 17 & 18, IA
- May 2nd breach occurred @ 9:30 am.
- Breach was about 1,100 linear feet, although the clay core remained generally intact providing limited protection.
- IA DNR had some shelfing near the outlet structure and some sloughing near the original Iowa River Spillway. Extra seeding and maintenance work in this stretch of the levee helped protect the system.
- FWS, in addition to the breach, had some interior shelfing.
- Corps, FWS, and DNR met following breach to discussion repair plans (July 2019).
- FWS removed debris, and filled and repaired low spots in the clay core between August and September 2019.
- FWS received funding for additional repairs.
- DNR requested FEMA funding.

River rose again in September 2019
- Corps provided technical assistance with breach repair (engineering (civil, hydraulics and geotechnical) and construction)
- IA DNR and FWS staff along with contractors, completed temporary repairs to the levee with recovered sand in order to protect the refuge from damage in October 2019.
- IA DNR also repaired the sloughing area on the downstream end as the river was rising.

2019 FLOOD DAMAGES –FUTURE REPAIRS

Lake Odessa, Pool 17 & 18, IA
- Tie into existing levee
- Restore levee to design grade
- Reconstruct a minimum 2 foot clay cap in all damaged areas
- Heavily seed repaired areas.
- Place a 2 foot clay face on the river side (if funding is available)
- Place riprap on river side (if funding is available)
- Estimated repair cost (to match work completed following the 2014 breaches) would roughly be around $1M.
- IA DNR is to consider placing stone protection on river side of levee from outlet structure to bend in the levee.

Huron Island Stage II, Pool 18, IA
- Channels were surveyed after high water and engineering is processing the data.
- It is possible that two of the locked logs were lost to flood waters, but water remains too high to check.
- Anchored logs remain in place.
- Berms to receive tree plantings remained undamaged, with minor erosion noted on the upstream end.
Annual Prevalence of Submersed Macrophytes is Correlated to Prior Year’s Summer Water Levels

Eric Lund | Aquatic Vegetation Specialist
UMR-CC Showcase
UMR-CC Quarterly Meeting
October 2019

Background

• Water level fluctuations
• Clarity
• Biota

The Pool 4 Trichotomy

• Initial SAV increase in Pool 4 started 2 years earlier in Lower Pool
• Previous study (Moore 2014) recommendations:
  1) Utilize water quality SRS data
  2) Test for lagged SAV response to environmental conditions


Study Area

• Pool 4, above Lake Pepin
• Connected Backwaters (586 ha)
• Limited SAV communities (early successional ?)
• High variability: water quality, water levels, annual SAV occurrence

Methods – SAV Annual Change

Traditional Metric:

Change PFO = \frac{(PFO \text{ current year} - PFO \text{ previous year})}{PFO \text{ previous year}}

This study metric:

\text{PFO} = \text{number of sites where SAV detected} \times \text{number of sample sites}
Methods – Predictor Variables

8 Predictor Variables

Sources:
• Literature review
• Index of hydraulic alteration (Richter et. al, 1996)
• Available data

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<tr>
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<th>Category</th>
<th>Source</th>
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<tbody>
<tr>
<td>Total Suspended Solids</td>
<td>Water Quality</td>
<td>Quarterly LTRM sample events</td>
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<tr>
<td>Chlorophyll-a</td>
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<td>Median (median)</td>
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<td>Conductivity</td>
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<td>USACE</td>
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<tr>
<td>Minimum Discharge</td>
<td>Hydrology</td>
<td>USACE</td>
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<td>WQ/Hydro</td>
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<td>Number of High Discharge Days</td>
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<td>Derived</td>
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<tr>
<td>Number of Days Depth</td>
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<tr>
<td>at Veg Sites within the</td>
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<td></td>
</tr>
<tr>
<td>photic zone</td>
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</table>

Methods – Analysis

Pearson Correlation
- Annual change SAV ~ 8 predictors
- Each of 10 preceding seasons
- SAV Sampling: 1998-2017 (n=20 yrs)

Example analysis seasons (veg sample = 2017):

Results – SAV vs Hydrology

- **P<0.10**
- **P<0.05**

Beyond the P-values

Results – SAV vs Water Quality

- **P<0.10**
- **P<0.05**

Results - Summary

Annual Change in SAV Occurrence is influenced by specific hydrological conditions during current and/or prior summer(s)

<table>
<thead>
<tr>
<th></th>
<th>Summer Current Year</th>
<th>Summer 3 Yr Prior</th>
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<tbody>
<tr>
<td>Number of Low Discharge Days</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Minimum Discharge</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Number of Days in Photic Zone</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Number of High Discharge Days</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

Discussion

Limitations
- Variables and seasons considered independently (and covary)
- Did not test for variable combinations or cumulative effects
- Water quality conditions representative of entire seasons?

Implications
- Water level management
- Long-term hydrological trends

What about all the recent high summer flows?
Current and Future Work

Extend and Expand
• Finer temporal scale
• Other reaches and pool (137)
• Multivariate (Cumulative) Relationships

Improved SAV metrics
• Biomass (ongoing)
• Community delineations (knowledge gap)

SAV increase part of an ecological shift?
Burdis et. al, in review. Ecological Shift in Backwater Lakes of the Upper Mississippi River

Acknowledgements

MN LTRM Team
Megan Moore | Rob Burdis | Steve DeLain | Chris Dawald

Reviewers
Jim Rogala (USGS) | Kyle Bales (IA DNR)

Questions?
UMRR PROGRAM REPORTS

Habitat Restoration
- District Reports
- Project Selection Process
Long Term Resource Monitoring
- LTRM FY 2019 3rd Quarter Highlights
- USACE LTRM Update
- A-Team Report

DISTRICT REPORTS

ST. PAUL DISTRICT (MVP)
FY20 HREP Work Plan (30 Oct 2019)

PLANNING:
- Lower Pool 10 Islands HREP, (Pool 10, IA)
  - Continue Feasibility Study
- Reno Bottoms HREP, (Pool 9, MN/IA)
  - Continue Feasibility Study

DESIGN:
- McGregor Lake HREP, (Pool 10, WI)
  - Continue contract documents and complete in 2nd Qtr.

CONSTRUCTION:
- Harpers Slough Islands HREP, (Pool 9, IA)
  - Islands W2 & M2 Damaged
  - Proposed Repair (2020)
- McGregor Lake HREP, (Pool 10, WI)

EVALUATION:
- Next Generation HREP Fact Sheets

ROCK ISLAND DISTRICT (MVR)
FY20 HREP WORK PLAN (OCTOBER 2019)

PLANNING:
- Steamboat Island, Pool 14, IA
  - PFS is making feasibility happen
- DOCR is scheduled for January 30th

DESIGN:
- Keithsburg Division Stage II, Pool 15, IL
  - POT kickoff meeting was on August 26th
  - 33% review and YE are scheduled for January

CONSTRUCTION:
- Pool 12 Overwintering, Pool 12, IL
  - Stage II & III
  - No work currently due to high water
- Keithsburg Division Stage I, Pool 18, IL
  - Pre construction meeting held on October 17th
  - Access to the site is inundated
- Green Island Stage II & III, Pool 18, IA
  - Stage II & III
  - No work currently due to high water
  - Site visit for October was cancelled due to high water

EVALUATION:
- Keithsburg Division Site Access
- Beaver Island - Dredging
ST. LOUIS DISTRICT (MVS) FY20 HREP WORK PLAN (30 OCT 2019)

PLANNING
- Oakwood Bottoms, IL, HREP (Open River)
  - Submit Draft Feasibility Report to MVD for Approval, 4th Qtr.
- Yorkinut Slough, IL, HREP (IL River)
  - Feasibility Report
- Hamburg Bay, IL, HREP (Pool 25)
  - Feasibility Report

DESIGN
- Crains Island, IL, HREP (Open River)
  - Contract Award 2nd Qtr. FY20
  - Phase II P&S Design
  - P&S Ready to Advertise 4th Qtr. FY20
  - P&S Design
- Piasa & Eagles Nest, IL HREP (Pool 26)
  - P&S Ready to Advertise 4th Qtr. FY20
- Harlow Island, IL HREP (Open River)
  - P&S Design

CONSTRUCTION
- Crains Island, IL, HREP (Open River)
  - Earthwork & Pile Removal
- Clarence Cannon Refuge, MO HREP
  - Interior Water Control Structures
  - Pump Station
  - Exterior Berm Setback
- Ted Shanks, MO HREP (Pool 24)
  - Reforestation

EVALUATION
- Project Evaluation
- HREP call for New Fact Sheets
  - RRAT Tech./RRAT Exec.
  - November 2019

PROJECT SELECTION PROCESS UPDATE
Updated UMRS Systemic Spatial Data Viewer


- Serves a variety of spatial data for viewing online (no software needed).
- Includes:
  - Land cover data for 1890s, 1975, 1989, 2000, 2010/11
  - Level 2 and 3 Aquatic Areas (described in De Jager et al. 2018)
  - HREPs and Pool Boundaries
  - UMRS Floodplain Inundation attributes
- Embedded "help" feature is a good guide to the use of the viewer.
- Pictured to the right is the UMRS LTRM 2010-2011 15 class Land cover data.

Spatial Data Viewer developed by Jason Rohweder (USGS UMESC)

LTRM Spatial Data Query Tool updated through 2018


Lower Pool 13 Turbidity summary using Spatial Query Tool


<table>
<thead>
<tr>
<th>Year</th>
<th>Turbidity &gt; 20 NTU*</th>
<th>Turbidity &gt; 40 NTU</th>
<th>Turbidity &gt; 70 NTU**</th>
</tr>
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<tbody>
<tr>
<td>1993</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
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<td></td>
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<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

* Criteria suggested by UMRCC WQTS 2003 Report
** ~2/3 of these points represent data collected in July 2017

LTRM SAV surface maps updated through 2018


Dark green represents the highest probability of species occurrence and light blue represents the lowest probability; areas that are black are non-aquatic areas.
Third Status and Trends Report

- Chapter One: Introductory chapter to set context (Houser and colleagues)
  - Purpose and objectives of the report
  - Connections to other recent UMRR efforts (Resilience assessment, HNA 2, etc.). HNA 2 and ST1 should be largely complementary b/c of the scale/resolution of the data included in each.

- Chapter Two: Physical and hydrological template of the UMRS
  - System Overview & Basic Longitudinal Summaries of Geomorphology
    - Hydrology (in Appendix)
    - Sediment (in Appendix)
    - Land cover (De Jager)

- Chapter Three: Major Changes in the UMRS
  - Long term changes in water clarity and vegetation in the upper impounded reach and combined changes in other biota (e.g., common carp). (Houser and colleagues)
  - Long term changes in abundance of Asian carp and associated changes in and ecosystems. (Ickes and colleagues)

- Chapter Four: Status and Trends of Indicators of Ecosystem Health:
  - Water Quality (Jankowski)
  - Aquatic vegetation (Larson)
  - Fish (Janes)

- Chapter 5: Conclusions / synthesis (Houser and colleagues)

Approach to 2020 UMRR Science Meeting

- Assess current information needs for the understanding, management, and restoration of the UMRS (within the context of the mission of the UMRR Program).
  - Initial draft of 2020 focal areas was provided to A-team as a read ahead for the 17 October 2019 and discussed extensively during the 1st December 2019 meeting.
  - Written comments have been received and the draft document is being revised accordingly.

- Develop specific proposals/scopes for work to be done using 2020 UMRR funding available in 2020.
  - A small number of larger, collaborative projects that collectively address a subset of priority questions/issues
  - Developing initial outlines and drafts of proposals will be the focus of the 2020 January UMRR Science Meeting – a “working meeting”.

- Prepare for the meeting with initial calls/webinars for each prospective working group.

Assess current information needs for the understanding, management, and restoration of the UMRS


- Reports and recommendations from previous sedimentation and geomorphology workshops (Gaugush and Wilcock 1994; Gaugush and Wilcock 2002)

- Synthesis of previous studies on the UMRS: hydrology: 2010 Special Issue – e.g., Sparks 2010 and references therein

- The 2009 Reach Objective publication (USACE 2011) from which information needs may be inferred

- The 2005-2025 UMRR Strategic Plan (UMRR 2015) which clearly identifies the main objectives of river restoration efforts and the knowledge needed to do up under the broad vision of maintaining a “healthier and more resilient Upper Mississippi River Ecosystem that sustains the river’s multiple functions” etc. (USACE 2022)


- Conceptual models derived from several previous and ongoing efforts (USACE 2011, Neelst et al. 2016, Bovina et al. 2018, Bovina et al. Submitted)

- Recent results from 2019 HREP workshops

- Information needs derived from ongoing discussions with HREP PIs (e.g., Rens Bottoms, Lower Pilot 13)
2020 Science Meeting as a forum for developing Science in Support of Management projects

- Foster collaborative approach and larger projects
- More effectively incorporate UMRR LTRM’s unique strengths
- Facilitate a more direct interaction between restoration practitioners, natural resource managers, and research scientists during proposal development process

Goal for 2020 Science Meeting working groups

**Goal:** Identifying and understanding plausible futures for the Hydrology and geomorphology of the UMRS and the implications regarding the structure, function, and management and restoration of the river-floodplain ecosystem.

- What will the river look like in 50 – 100 years?
- What does this mean for the distribution and abundance of habitat (aquatic areas) and biota?
- What are the implications for current restoration and management actions?

A changing river

- System is still adapting to the locks and dams and changes in catchment land use.
- Hydrograph is dynamic, even in the absence of longer term hydrologic changes.
- There are longer term hydrologic changes.
- There are ongoing changes to the biological components, for example:
  - Decline in common carp
  - Variability of vegetation through time
  - Proliferation of Asian carp
  - Spread of reed canary grass, Japanese hops, etc.
- What does all this mean for our understanding of the structure and function of the UMRS and current and future management and restoration actions?

Projected climate/hydro changes: An example:


Next steps

- Revise focal areas in response to A team input
- Read aheads distributed for 6 November UMRR webinar (1 November)
- UMRR Science Meeting Focal area webinar (6 November at 1:00 pm)
- Finalize working group topics, leaders and initial members based on partnership input. (mid/late November)
- Initial working group calls/webinars to prepare for Science Meeting (December)
- January 14 – 16 – 2020 UMRR Science Meeting La Crosse, WI.
Questions?
The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation.

UMRR MONITORING AND SCIENCE UPDATE
Karen Hagerty
Rock Island District
30 October 2019

UMRR MONITORING & SCIENCE FY20
2 SOWs in FY20
SOW for LTRM base monitoring $5.0M
SOW for science in support (analysis under base) $1.3M
Both SOWs together are equivalent to a fully funded UMRR LTRM element $6.3M
Science in Support of Restoration & Management (research) $2.5M
TOTAL: $8.8M

UMRR MONITORING & SCIENCE FY2020
LTRM

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<td>Great Rivers (IL)</td>
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<td>Big Rivers &amp; Wetlands (MO)</td>
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<td>Equipment</td>
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UMRR MONITORING & SCIENCE FY2020

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<tr>
<td>B. Chloride monitoring (3 years)</td>
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<td>C. Seamless wind fetch products</td>
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<td>D. LTRM spatial data to web mapping services</td>
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<td>E. Ecohydrology (2 Years)</td>
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<td>F. Science meeting proposals</td>
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Subtotal $2,500,000