

**Upper Mississippi River Restoration  
Environmental Management Program  
Coordinating Committee  
Quarterly Meeting**

**May 14, 2014**

**Highlights and Action Items**

**Program Management**

- UMRR-EMP's FY 14 internal allocations under its \$31.968 million appropriation are as follows:
  - Regional Management – \$1,000,000
  - LTRMP element – \$5,225,000
  - HREPs element – \$25,743,000
    - Regional science support – \$1,065,700
    - MVP – \$6,980,400
    - MVR – \$10,466,500
    - MVS – \$7,230,400

[Note: At the end of FY 13, funds were transferred among UMR Districts to get critical work accomplished and to maximize the amount of funds obligated. The FY 14 allocations to all three Districts reflect rebalancing of those internal funds.]

- The program's overall spending on science in FY 14 is \$7.754 million: \$314,000 in regional management, \$5.4 million for base monitoring (includes carry-over), \$1.065 million on research and analysis to inform restoration, and \$325,000 in each UMR District to standardize habitat project monitoring protocols.
- **The President's FY 15 budget request for UMRR-EMP is \$33.17 million, its full annual authorized amount.**
- **The UMRR-EMP agency leadership summit is rescheduled for September 18, 2014.** The summit will still be held at Eagle Point Park in Dubuque and will include an indoor discussion session in the morning and a field trip to Sunfish Lake in the afternoon.
- The March 2014 *Our Mississippi* newsletter highlighted UMRR-EMP, including the tremendous contributions by all program partners.

**Strategic Planning**

- **The UMRR-EMP strategic planning team is currently employing a targeted review of the draft UMRR Strategic Plan, dated April 11, 2014.** This approach is meant to seek essential feedback from those organizations and individuals who are directly involved in the program's policy and implementation. **The planning team will consider the input this summer and prepare a revised draft for the UMRR-EMP CC's consideration at its August 6, 2014 meeting. Following UMRR-EMP CC's approval, the team will distribute the plan to external stakeholders.**
- The planning team believes that, when implemented, the strategic plan will result in:

- Even more effective habitat restoration projects
- Even more effective application of science (especially ecological, biological, and engineering) to habitat restoration work
- Deeper understanding of the dynamics and details of river health and resilience
- Stronger commitment to the collection, maintenance, and application of long term monitoring data to measure the UMR's health and resilience
- Even stronger partnership among the organizations that participate directly in the program
- And, most importantly, the UMR will be healthier and more resilient because of the program's work
- In addition, Marv Hubbell anticipates several important changes to the program's current operations. (See attached for a list of those changes.)
- **The UMRR-EMP CC members said their respective agencies are supportive of the draft plan and its concepts for the program's future direction.**

### **Long Term Resource Monitoring Element**

- A technical report was published that examines the relationship between the abundance of submersed aquatic vegetation (SAV) and vegetation-associated fish: weed shiners and young-of-year bluegills and largemouth bass. The analysis indicates that there may be a threshold of 60 to 75 percent of SAV present in backwaters to have a positive affect on the fish. Above that threshold, the fish become either more affected by other environmental factors or SAV levels are too high.
- UMRCC's 2014 annual meeting focused on progress in advancing the Master Plan's long term resource monitoring goals. Participants concluded that the original purpose for long term resource monitoring has largely been achieved. Even more, partners have gone even further than understanding trends to how the UMRS functions through knowledge gained about ecological patterns, relationships between variables, responses to management, modeling, and so on.
- **The UMRR-EMP CC voted via email in early March on how to allocate \$1.061 million of UMRR-EMP's FY 14 funds for research and analysis to enhance restoration and management. The projects and associated lead(s) and milestones are on pages B-8 to D-10 of the agenda packet.**
- The A-Team held an in-person meeting on April 23, 2014. The team is considering language regarding what is a meeting quorum and may recommend to amend the UMRR-EMP Charter. The team discussed the draft UMRR strategic plan and generally expressed support for the plan. In addition, the A-Team discussed USACE's science priorities, indicators of health and resilience, habitat project monitoring protocols, research frameworks, and the Science Plan.
- Quinton Phelps presented analyses of UMRR-EMP's monitoring data showing the impacts of Asian carp on native fish species by comparing pools with high and moderate abundance and no presence of Asian carp, as well as pre- and post-invasion data.

### **Aquatic Invasive Species**

- Karen Hagerty presented on UMRR-EMP's role related to aquatic invasive species, per USACE's policies, including knowledge, leadership and coordination among partner agencies, early detection and response, and prevention in so far that the program's restoration enhances the river's resilience to invasion. **USACE will convene a writing team to draft a UMRR-EMP invasive species**

strategy. It is anticipated that the draft will be reviewed by the A-Team this fall and introduced to the UMRR-EMP CC at its November 19, 2014 meeting.

### **Habitat Rehabilitation and Enhancement Projects**

- MVS's current planning priorities are Rip Rap Landing and Clarence Cannon. Final construction details on Pools 25 and 26 Islands are nearing completion. **Given constraints on available new starts, the District is discussing with partners the possibility of moving Horseshoe Lake from USACE's Continuing Authorities Program to UMRR-EMP. District staff will present more information on the project at UMRR-EMP CC's August 6, 2014 meeting and ask the Committee for its support to proceed with the project.** The River Resources Action Team (RRAT) has expressed its support for transferring the project to UMRR-EMP.
- MVP anticipates completing plans on Harpers Slough and initiating construction on Stage's 1 and 2 of the project this fiscal year.
- MVR is focusing planning on Pool 12 Overwintering Stage II, Huron Island, and Beaver Island. Planning on Keithsburg will be initiated this summer. The District plans to initiate construction on Huron Island and Lake Odessa flood recovery this year. In addition, construction is proceeding on Pool 12 Overwintering Stage I, Fox Island, and Rice Lake Stage I.
- In late summer/early fall, the UMRR-EMP CC will initiate a "data-driven" process for selecting new starts that will be informed by partners' expertise and experience, the strategic plan and other program documents, and decision support tools. **Marv Hubbell requested that partners send him any input on the process by June 30, 2014.**
- Tim Eagan presented on tentative plans to improve water management capabilities, reconnect fragmented habitat needed for wetland species, and increase floodplain connectivity at Clarence Cannon.

### **Other Business**

- **Upcoming quarterly meetings are as follows:**
  - **August 2014 — East Peoria**
    - UMRBA meeting — August 5
    - **UMRR-EMP CC — August 6**
  - **November 2014 — St. Paul**
    - UMRBA water quality meeting — November 17
    - UMRBA meeting — November 18
    - **UMRR-EMP CC — November 19**
  - **February 2015 — Quad Cities**
    - UMRBA meeting — February 10
    - **UMRR-EMP CC — February 11**

**Marv Hubbell's thoughts on how partners will need to achieve the UMRR-EMP Strategic Plan's vision, mission, and goals**

*(Shared at the May 14, 2014 UMRR-EMP CC quarterly meeting)*

- Actions for all partners
  - a) Characterize/define the existing health and resilience of the UMR ecosystem
  - b) Use existing, and potentially new, data sets or indicators to establish a baseline and monitor change
  - c) Use existing, and potentially new, indicators to monitor progress
  - d) Identify, select, formulate new projects based on their potential contribution to increasing the UMR ecosystem's health and resilience
  - e) Communicate to the partnership more frequently regarding progress in achieving a healthier and more resilient UMR ecosystem
  - f) Enhance integration among the program's various restoration and science efforts
  - g) Focus science efforts to more effectively address rehabilitation and management needs
  - h) Refer to the program as UMRR with a habitat restoration element and a science element
  - i) Increase efforts to measure, and report progress to Headquarters and OMB in enhancing, UMR ecosystem health and resilience
- Actions for Corps staff
  - a) Access monitoring data and scientists to a greater degree throughout project planning
  - b) Increase use of habitat projects to test important science questions regarding the UMR ecosystem
  - c) Improve project monitoring plans to measure project outcomes – e.g., biological responses
  - d) Focus future research more on science questions related to restoration and management
  - e) Focus the next generation of habitat projects more on enhancing ecological health and resilience
  - f) Link models used for plan formulation and project evaluation
  - g) Increase involvement in management of habitat projects post-construction
  - h) Create a central database of science and habitat project information
  - i) Use standard monitoring techniques/protocols across Districts
- Actions for USGS-UMESC and field stations
  - a) Increase use of habitat projects to test important science questions regarding the UMR ecosystem
  - b) Focus future research more on science questions related to restoration and management
  - c) Increase involvement with project planning teams in project formulation



## Meeting with Senior Leaders

- Key Program Issues
- **Date – September 18, 2014**
- Location –Dubuque, IA



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## Meeting with Senior Leaders

- Format – Meeting in AM, Field trip in PM
- Meeting Organizer – COL Deschenes
- Topics of interest to your Senior Leaders
  - ▶ Funding
  - ▶ Staffing
  - ▶ Strategic Plan
  - ▶ Navigation and Ecosystem Restoration
  - ▶ Emerging Issues
  - ▶ Other



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## Program Bulletin



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## New Issue of ...



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## UMRR Strategic Plan

- Initiated because:
  - ▶ **Need to have a plan that reflected the entire range of activities carried out by the Program.**
    - Only developed strategic plans for the LTRM element in the past.
  - ▶ **Need to more closely link rehabilitation with monitoring and science efforts.**



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## UMRR Strategic Plan

- Corps being more involved in the LTRM SOW and budget development process
- Need to clearly link recommendations in a variety of documents:
  - ▶ Three Reports to Congress
  - ▶ Implementation Issues Assessment (IIA) Papers
  - ▶ Status and Trend Reports
  - ▶ LTRM Strategic Plan and Operational Plans
  - ▶ EMP/NESP Transition Plan



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## Strategic Planning Meetings

- Date: April 9-11, 2013 (La Crosse)
- June 18-20, 2013 (R.I. Arsenal)
- August 22, 2013 (Webinar)
- November 5-7, 2013 (R.I.) *cancelled*
- January 6-8, 2014 (R.I. Arsenal)
- April 8-10, 2014 (R.I. Arsenal)
- June 2014**



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## 1<sup>st</sup> Meeting Highlights

- Key Issue areas identified:
  - ▶ Defining Success
  - ▶ Ecosystem Restoration
  - ▶ Ecosystem Monitoring
  - ▶ Collaboration
  - ▶ Communication
  - ▶ Funding
  - ▶ Integration



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## 2<sup>nd</sup> Meeting Highlights

- |                         |                   |
|-------------------------|-------------------|
| ▪ Defining Success      | Rob Maher         |
| ▪ Ecosystem Restoration | Kara Mitvalsky    |
| ▪ Ecosystem Monitoring  | Jeff Houser       |
| ▪ Collaboration         | Janet Sternburg   |
| ▪ Communication         | Kevin Stauffer    |
| ▪ Funding               | Kirsten Mickelson |
| ▪ Integration           | Marvin Hubbell    |



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## 3<sup>rd</sup> Meeting Highlights

- Draft Vision, Mission, Assumptions, and Guiding Principles Statements
- Goal 1 – Enhance Habitat ...
- Goal 2 – Enhance (Advancing) Knowledge
- Goal 3 – Collaboration... (external)
- Goal 4 – Enhance Partnership ... (internal)



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## 4<sup>th</sup> Meeting Highlights

- Revised
  - ▶ Vision, Mission, Goals and Objectives, and Guiding Principles – Page C-5
- **Key Outcomes and recommendations!**
  - ▶ Cohesive Vision Statement that unifies the actions of the Program!  
“A **healthier** and **more resilient** UMR ecosystem that sustains the river’s multiple uses.”
  - ▶ Embrace the name of UMRR
  - ▶ Embrace enhanced Program integration



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## 5<sup>th</sup> Meeting Highlights

- Refined the draft Plan for stakeholder review
- Developed a stakeholder review process and schedule.
  - ▶ Identified key stakeholders
  - ▶ Assigned responsibilities for “high touch” review of the Plan



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## 6th Meeting

Review feedback and settle on final draft to submit for UMRR EMP-CC endorsement

Key issues for implementation:

- a) Revised budget coordination
- b) What stakeholder engagement is needed after plan approval?
- c) How to operationalize the plan



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## Outcomes of the Plan

- Even more effective habitat restoration projects
- Even more effective application of science (esp. ecological, biological, and engineering science) to habitat restoration work



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## Outcomes of the Plan

- Deeper understanding of the dynamics and details of river health and resilience
- Stronger commitment to the collection, maintenance, and application of long term monitoring data
- An even stronger partnership among the organizations that participate directly in the Program
- And, most importantly, the UMRS will be healthier and more resilient because of the Program's work.



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## Achieving these outcomes will require change

Significance of these recommendations:

- Require us to characterize/define the existing health and resiliency of the system
- Use existing and potentially new data sets or indicators to establish a baseline and to monitor change
- Utilize existing and develop new indicators to monitor progress



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## Other Changes

- Identification, selection, formulation of new projects will be based upon their contribution to increasing health and resiliency
- Provide feedback to the Partnership and others regarding progress
- Enhanced integration
- Focus science efforts to more effectively address rehabilitation and management needs



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## Anticipated Changes for all Partners

- Refer to this Program as UMRR with a habitat restoration element and a research element.
- Greater emphasis on measuring and reporting progress to HQ and OMB.



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## Anticipated Changes for Corps Staff

- Greater emphasis on measuring and reporting progress to HQ and OMB.
- PDT's will have greater access to monitoring data and scientists within USGS, LTRM field stations, and the Corps.
- Increased use of habitat projects to test important science questions on the UMRS.
- Improved monitoring plans in DPR's to help measure project outcomes.



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## Anticipated Changes for Corps Staff

- Future research will be more focused on needs related to restoration and management.
- The next generation of habitat projects will be more focused on river health and resilience.
- Greater linkage of models used for plan formulation and evaluation of project outcomes.



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## Anticipated Changes for Corps Staff

- Increased involvement in the management of habitat projects post construction (especially when there is an AM Plan).
- Refer to this Program as UMRR with a habitat restoration element and a research and monitoring element.
- Centralized databases.
- Standardized monitoring techniques/protocols across Districts.



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## Anticipated Changes for UMESC and Field Station Staff

- Refer to this Program as UMRR with a habitat restoration element and a research and monitoring element.
- Increased use of habitat projects to test important science questions on the UMRS.
- Future research will be more focused on needs related to restoration and management.
- Increased involvement with PDT's in project formulation.



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## Next Steps

Remaining schedule:

- Partner Review
  - ▶ Comments due to Strategic Team members by 31 May
  - ▶ "High Touch" Review
- 6<sup>th</sup> Meeting in June
- EMP-CC concurrence in August
- Operational Plan will be the annual SOW



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## UMRR Invasive Species Strategy

It's not just about Asian Carp anymore



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## UMRR Invasive Species Strategy

- UMRR Program context
- National, Corps, State policy context
- UMRR specific guidance for:
  - ▶ New discoveries
  - ▶ Restoration projects
  - ▶ Research



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## UMRR Program Context

UMRR focuses on:

- Identifying the status and trends of critical river components
- Gaining insight into ecosystem functions and factors influencing community structure
- Restoring habitat (quality and quantity) for native species (UMRR primary mission)



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## UMRR Program Does NOT

- Regulate harvest
- Monitor invasive species specifically
- Monitor the invasion front
- Control Invasive species populations



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## Invasive Species Policies

National

- National Invasive Species Act of 1996
- Invasive Species Executive Order 13112 (1999)
- National Invasive Species Management Plan (2008-2012)
- Corps of Engineers Invasive Species Policy (2009)



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## USACE Invasive Species Policy

USACE Invasive Species Policy (2009), compliments National Invasive Species Act, National Plan, as applicable to civil works programs & projects

- ▶ Leadership and coordination
- ▶ Prevent introduction & establishment
- ▶ Early detection & rapid response
- ▶ Control and management
- ▶ Restore native species, habitats, processes
- ▶ Conduct research
- ▶ Information management
- ▶ Education & public awareness



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## UMRR Focus

- Leadership and coordination
  - ▶ Coordinate with Corps Invasive species leaders
  - ▶ Partners coordinate with their organizations
- ▶ ALL UMRR Partners
  - Coordinate through EMP CC, A-Team
  - Other communication strategy??



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## UMRR Focus

- Prevent introduction & establishment
  - ▶ No direct UMRR role



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## UMRR Focus

- Early detection & rapid response
  - ▶ All new detections reported to individual agencies (already in place)
  - ▶ UMRR to develop process to report new discoveries to UMRR management (at Corps and UMESC)
  - ▶ UMRR to consider adding invasive species to monitoring plans for projects



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## UMRR Focus

- Control and Management
  - ▶ UMRR not directly involved in control measures or invasive species management areas



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## UMRR Focus

- Restore native species, habitat conditions, and key ecological processes
  - ▶ UMRR restoration mission
    - Promote native species re-establishment
    - Identify impacts and costs from invasive species to project benefits
    - Identify & develop measures to prevent invasive species re-colonization



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## UMRR Focus

- Conduct research to ensure management programs are effective and science-based. ERDC has lead for Corps.
  - ▶ UMRR scientific research:
    - identifies invasive species impacts to native communities (i.e. before/after invasion)
    - identifies impacts to habitats
    - Identifies impacts to key ecological processes
    - Knowledge used to improve restoration project selection, planning, and construction



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## UMRR Focus

- Information Management to track invasive species data
  - ▶ UMRR utilizes websites to make data and reports available
    - USACE website for project data
    - USGS-UMESC website for research and monitoring data



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## UMRR Focus

- Education & Public Awareness – what can the public do; how can they help?
  - ▶ UMRR partners' outreach and education efforts continue



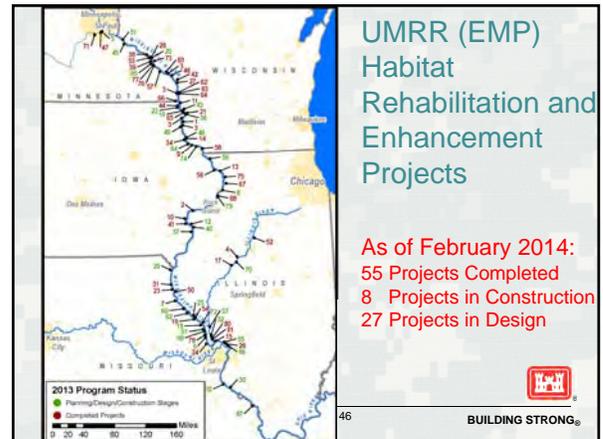
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## UMRR Next Steps

- Identify UMRR Invasive Species Strategy writing team
- Produce draft for A-Team at fall meeting
- Produce draft for EMP CC at Nov meeting
- Final strategy for EMP CC at Feb meeting



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### ST. LOUIS DISTRICT (MVS) FY14 HREP Work Plan (May 14, 2014)

#### PLANNING

- ▶ Rip Rap Landing, IL
  - Complete DPR 3<sup>rd</sup> QTR FY14
- ▶ Clarence Cannon Refuge, MO
  - Complete DPR 3<sup>rd</sup> QTR FY14
- ▶ Piasa and Eagles Nest Islands, Pool 26, IL
  - Draft DPR 2<sup>nd</sup> QTR FY15
- ▶ Other studies in the Queue
  - Middle River Opportunities MO/IL
  - Glades & Godar, IL River
  - West Alton, MO
  - Pool 24, MO

#### DESIGN

- ▶ Ted Shanks, MO
  - CN1/CS3 Water Control
  - Nose Slough/Deadman WC
  - Pump Station

#### CONSTRUCTION

- ▶ Ted Shanks, MO
  - SR1 Water Control
  - North Berm and Setback
  - HL1 Water Control
- ▶ Pools 25 & 26 Islands, MO
  - Bolters Island / Reforestation
- ▶ Batchtown, IL - Punchlist

#### EVALUATION

- ▶ Baseline Monitoring
- ▶ Post Project Monitoring
- ▶ Performance Evaluation



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## Ted Shanks, MO HREP



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### ST. PAUL DISTRICT (MVP) FY14 HREP Work Plan (14 May 2014)

<p><b>PLANNING</b></p> <p><b>Harpers Slough, Pool 9, IA/WI</b></p> <ul style="list-style-type: none"> <li>➢ DPR approval Jul 2014</li> </ul> <p><b>North &amp; Sturgeon Lakes, Pool 3, MN</b></p> <ul style="list-style-type: none"> <li>➢ Complete Draft DPR FY14</li> </ul> <p><b>Conway Lake, Pool 9, IA</b></p> <ul style="list-style-type: none"> <li>➢ Complete Draft DPR in FY14</li> </ul> <p><b>McGregor Lake, Pool 10, WI</b></p> <ul style="list-style-type: none"> <li>➢ Complete Draft DPR FY14</li> </ul> <p><b>Other studies in the Queue</b></p> <p>Weaver Bottoms, Clear Lake, Bass Lake Ponds, Pool 10 islands</p>	<p><b>DESIGN</b></p> <ul style="list-style-type: none"> <li>➢ Harpers Slough Stage's 1 and 2</li> </ul> <p><b>CONSTRUCTION</b></p> <p><b>Capoli Slough Islands, WI</b></p> <ul style="list-style-type: none"> <li>➢ Stage 1 (Newt Marine)</li> <li>➢ Stage 2 (McHugh/JF Brennan)</li> <li>➢ Project Dedication Aug or Sep</li> </ul> <p><b>Harpers Slough, IA</b></p> <ul style="list-style-type: none"> <li>➢ Award Stage 1 in September</li> </ul> <p><b>EVALUATION</b></p> <ul style="list-style-type: none"> <li>➢ Baseline Monitoring</li> <li>➢ Post Project Monitoring</li> <li>➢ Performance Evaluation</li> </ul>
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## Capoli Slough





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### ROCK ISLAND DISTRICT (MVR) FY14 HREP Work Plan (May 14, 2014)

<p><b>PLANNING</b></p> <ul style="list-style-type: none"> <li>➢ Pool 12 Overwintering Stage II, IL</li> </ul> <p><b>DESIGN</b></p> <ul style="list-style-type: none"> <li>➢ Pool 12 Overwintering Stage II, Pool 12 IL</li> </ul> <p><b>CONSTRUCTION</b></p> <ul style="list-style-type: none"> <li>➢ Lake Odessa Flood Recovery, IA Pools 17 and 18, IA</li> <li>➢ Pool 12 Overwintering Stage I, Pool 12 IL</li> </ul> <p><b>EVALUATION</b></p> <ul style="list-style-type: none"> <li>➢ FWS</li> <li>➢ Baseline Monitoring</li> <li>➢ Adaptive Mgmt. Pool 12</li> </ul>	<ul style="list-style-type: none"> <li>➢ Huron Island, Pool 18, IA</li> <li>➢ Beaver Island, Pool 14, IA</li> </ul> <ul style="list-style-type: none"> <li>➢ Huron Island, Pool 18, IA</li> <li>➢ Lake Odessa Flood Recovery, IA</li> </ul> <ul style="list-style-type: none"> <li>➢ Fox Island, Pool 20, MO</li> <li>➢ Rice Lake Stage I, IL LaGrange Pool</li> <li>➢ Huron Island, Pool 18, IA</li> </ul> <ul style="list-style-type: none"> <li>➢ Post Project Monitoring</li> <li>➢ Performance Evaluations (3) <ul style="list-style-type: none"> <li>➢ Bertom and McCartney</li> <li>➢ Big Timber</li> </ul> </li> <li>➢ Pool 11 Overwintering</li> <li>➢ Chautauqua NWF</li> </ul>
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## HREP: Rice Lake

RM 132.0 through 138.0 of the Illinois Waterway (LaGrange Pool)  
Fulton County, Illinois

- Stage I Contract awarded Sept 19, 2011 for \$3.64 million to S&F, Inc. from Akron, OH. Stage I Contract includes a reinforced concrete pump station (3-48" pumps) on steel H-piles, masonry pump station control building, discharge channel excavation, water control structures (stoplog and sluice gate), overflow and natural spillway embankment using wet and dry material, reinforced concrete outlet structure & mechanical dredging.

Construction delayed due to winter conditions and spring highwater.



Figure ES-1  
Rice Lake  
Project Location Map





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## HREP: Rice Lake

2013 Flood Damages




Overflow Spillway Dry  
Sta 11+00 to 15+00 Scour

Washout around outfall upstream



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## HREP: Fox Island

RM 353.6-358.5 of the Mississippi River (Pool 20)  
Clark County, Missouri

- **Started Construction in September 2011.** Work includes: installation of 2 wells, 6 stoplogs, channel excavation, and plantings. It is expected to cost \$3.5 million.
  - Completed planting cover crop and trees in Dec.)
  - Spring construction season to start this week.



Logjam on the Fox River



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## HREP: Lake Odessa

Mississippi River Miles 434.5-441.5 (Pool 17 and Pool 18)  
Louisa County, Iowa

- All work was substantially complete on June 5, 2012. Contractor submitted survey to verify conformance to final grades.
- Final Payment Made on Stage IB and II B
- Initiated development of O & M Manual
- *Flood Recovery Const. contract award in FY 14*





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## HREP: Lake Odessa Flood damages





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## HREP: Lake Odessa Flood Damages





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## New Project Starts FY17-FY18

- Process
  - ▶ Early Discussion of effort – Aug. 2013
  - ▶ **Progressive Discussion**
    - Building on the past – looking towards the future
  - ▶ Linkage to all other efforts
    - Reports to Congress
    - IIA
    - Strategic Planning
    - Charters
    - Goals and Objectives
    - Etc.



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## New Project Starts FY17-FY18

- Goals for Process
  - ▶ **Building on the past**
    - 1998 & 2008 - Status and Trends Reports
    - 2000 - HNA
    - 2003 - HREP Planning and Sequencing Document
    - 2005 - Structured Decision Making principles
    - 2006 & 2012 – HREP Environmental Design Handbooks
    - 2008 - Jointly Adopted System Goals
    - 2011 - Reach Objectives
    - 26 years of research, monitoring, PER data, etc.
    - Systemic Data layers (LIDAR, LULC, Bathymetry)



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## New Project Starts FY17-FY18

- Goals for Process
  - ▶ **Looking towards the future**
    - Application of systemic data layers and research and monitoring efforts
    - Development and application of appropriate models
    - Application of decision support tools
    - Refinement of UMRS Reach Objectives to help inform the application of decision support tools, data, and models.



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## New Project Starts FY17-FY18

- General Thoughts
  - ▶ This process should be:
    - More data driven than earlier efforts
    - Greater utilization of GIS tools
    - Greater utilization of models
    - Refine and Utilize UMRS Goals and Reach Objectives as needed
    - Serve as a building block towards addressing the question of "What is our vision of success?"



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## New Project Starts FY17-FY18

- Next Steps
  - ▶ EMP-CC Feedback on approach
  - ▶ Proposed schedule (FY15 -
    - Formal start – 1<sup>st</sup> Quarter FY15
      - ▷ Develop Outline
      - ▷ assemble key data sources
      - ▷ Identify perspective members of SET
      - ▷ Link rehabilitation efforts to refined goals, objectives, indicators, and data from base monitoring
    - Completion – 2<sup>nd</sup> Quarter FY17



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## Question of the Quarter

- What is the total amount of funding that the UMRR Program has received from FY85 thru FY14?
- A. \$250,000,000 to \$350,000,000
- B. \$351,000,000 to \$450,000,000
- C. \$451,000,000 to \$550,000,000
- D. \$551,000,000 to \$650,000,000



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C. \$476,698,000



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Mud Lake Pool 11 July 2006 BUILDING STRONG®

### Completed Projects

Illinois



Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Andalusia Refuge	393	\$2,741,000	\$0	\$2,741,000
Banner Marsh	4,290	\$5,339,000	\$1,780,000	\$7,119,000
Cahoon Point	2,135	\$10,764,000	\$0	\$10,764,000
Chautauque Refuge	3,840	\$14,151,000	\$0	\$14,151,000
Gardner Division (Long Island Division)	6,300	\$7,760,000	\$0	\$7,760,000
Peoria Lake	2,500	\$3,235,000	\$42,000	\$3,277,000
Potters Marsh	2,305	\$3,007,000	\$0	\$3,007,000
Spring Lake	3,300	\$6,530,000	\$0	\$6,530,000
Stump Lake	2,960	\$6,057,000	\$0	\$6,057,000
<b>Total:</b>	<b>37,218</b>	<b>\$71,165,000</b>	<b>\$3,644,000</b>	<b>\$74,809,000</b>

Field Station	Total Cost
National Great Rivers Research & Education Center Biological Field Station	\$ 8,783,000
Illinois River Biological Field Station	\$ 9,753,000
<b>Total Science &amp; Monitoring</b>	<b>\$17,536,000</b>



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**Illinois**

**Future Projects**

Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Bechtown	3,280	\$17,091,000	\$146,000	\$17,237,000
Boston Bay	900	\$6,337,000	\$0	\$6,337,000
Delair Division	1,685	\$9,500,000	\$0	\$9,500,000
Glades Wetlands	2,650	\$17,218,000	\$0	\$17,218,000
Godar Refuge	2,400	\$8,202,000	\$0	\$8,202,000
Keithsburg Division	1,390	\$6,350,000	\$0	\$6,350,000
Pool 12 Overwintering	7,990	\$20,656,000	\$0	\$20,656,000
Reed's Landing Wetlands	1,620	\$4,484,000	\$0	\$4,484,000
Rip Rap Landing	2,300	\$8,169,000	\$231,000	\$8,400,000
Salt Lake/Ft. Chartres Side Channel	60	\$2,000,000	\$0	\$2,000,000
Swan Lake	2,900	\$15,623,000	\$262,000	\$15,885,000
<b>Total:</b>	<b>32,225</b>	<b>\$132,881,000</b>	<b>\$408,000</b>	<b>\$133,289,000</b>

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**Iowa**

**Completed Projects**

Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Big Timber	1,039	\$851,000	\$0	\$851,000
Brown's Lake	453	\$2,093,000	\$0	\$2,093,000
Bussey Lake	494	\$3,432,000	\$162,000	\$3,594,000
Guttenberg Waterfowl Ponds	198	\$327,000	\$0	\$327,000
Lake Odessa	6,788	\$22,600,000	\$0	\$22,600,000
Lansing Big Lake	6,420	\$2,090,000	\$0	\$2,090,000
Pleasant Creek	2,350	\$1,312,000	\$0	\$1,312,000
Pool 11 Islands-Mud Lake	4,550	\$4,597,920	\$0	\$4,597,920
Pool Slough	620	\$518,000	\$175,000	\$693,000
Princeton Refuge	1,129	\$4,006,000	\$54,000	\$4,060,000
<b>Total:</b>	<b>24,041</b>	<b>\$41,826,920</b>	<b>\$391,000</b>	<b>\$42,217,920</b>

Field Station	Total Cost
Iowa DNR Mississippi River Biological Field Station	\$9,786,000

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**Iowa**

**Future Projects**

Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Beaver Island	1,750	\$13,375,000	\$0	\$13,375,000
Conway Lake	1,043	\$2,512,000	\$0	\$2,512,000
Harpers Slough	2,200	\$12,150,000	\$0	\$12,150,000
Huron Island	2,000	\$13,773,000	\$0	\$13,773,000
Lower Pool 10 Island and Backwater Complex	2,340	\$6,000,000	\$0	\$6,000,000
Steamboat Island	1,280	\$7,780,000	\$0	\$7,780,000
Turkey River Bottoms Delta and Backwater Complex	3,638	\$18,700,000	\$0	\$18,700,000
<b>Total:</b>	<b>14,251</b>	<b>\$74,290,000</b>	<b>\$0</b>	<b>\$74,290,000</b>

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**Minnesota**

**Completed Projects**

Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
East Channel	320	\$559,000	\$0	\$559,000
Finger Lakes	530	\$1,445,000	\$0	\$1,445,000
Island 42	420	\$262,000	\$0	\$262,000
Long Meadow Lake	2,340	\$750,000	\$0	\$750,000
Peterson Lake	614	\$1,179,000	\$0	\$1,179,000
Polander Lake	790	\$3,000,000	\$0	\$3,000,000
Pool 8 Islands Phase III	3,288	\$19,650,000	\$0	\$19,650,000
Pool Slough	620	\$518,000	\$175,000	\$693,000
Rice Lake-MN	807	\$682,000	\$0	\$682,000
<b>Total:</b>	<b>9,729</b>	<b>\$28,045,000</b>	<b>\$175,000</b>	<b>\$28,220,000</b>

Field Station	Total Cost
State of Minnesota, Lake City Biological Field Station	\$ 10,170,000

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**Minnesota**

**Future Projects**

Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Bass Ponds, Marsh, and Wetland	390	\$3,000,000	\$0	\$3,000,000
Clear Lake (Finger Lake) Dredging	321	\$2,500,000	\$0	\$2,500,000
North and Sturgeon Lakes	5,150	\$8,000,000	\$0	\$8,000,000
Weaver Bottoms	4,883	\$10,000,000	\$0	\$10,000,000
<b>Total:</b>	<b>11,134</b>	<b>\$26,500,000</b>	<b>\$0</b>	<b>\$26,500,000</b>

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**Missouri**

**Completed Projects**

Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Bay Island	650	\$3,112,000	\$0	\$3,112,000
Clarkville Refuge	312	\$454,000	\$0	\$454,000
Culvre Island	2,180	\$1,444,000	\$479,000	\$1,923,000
Dresser Island	940	\$2,804,000	\$0	\$2,804,000
Monkey Chute	88	\$55,000	\$0	\$55,000
Pharis Island	525	\$2,783,000	\$0	\$2,783,000
Stag and Keaton Islands	470	\$471,000	\$0	\$471,000
<b>Total:</b>	<b>5,165</b>	<b>\$11,224,000</b>	<b>\$479,000</b>	<b>\$11,703,000</b>

Field Station	Total Cost
Big Rivers & Wetlands Biological Field Station	\$7,387,000

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Future Projects

Missouri



Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Clarence Cannon	3,750	\$25,800,000	\$0	\$25,800,000
Fox Island	2,033	\$4,800,000	\$0	\$4,800,000
Harlow Island	1,300	\$6,500,000	\$0	\$6,500,000
Piasa - Eagle's Nest Islands	1,600	\$5,500,000	\$0	\$5,500,000
Pool 24 Islands	3,150	\$9,492,000	\$0	\$9,492,000
Pool 25 and 26 Islands	2,026	\$2,660,000	\$0	\$2,660,000
Teal Shanks	2,900	\$29,506,000	\$0	\$29,506,000
West Alton Tract	610	\$6,532,000	\$0	\$6,532,000
Wilkinson Island	2,700	\$5,980,000	\$0	\$5,980,000
<b>Total:</b>	<b>27,271</b>	<b>\$111,582,000</b>	<b>\$0</b>	<b>\$111,582,000</b>



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Completed Projects

Wisconsin



Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Ambrough Slough	2,746	\$2,461,000	\$168,000	\$2,627,000
Bertram Mccarney Lakes	2,000	\$2,440,000	\$0	\$2,440,000
Blackhawk Park	82	\$32,000	\$77,000	\$309,000
Cold Springs	30	\$463,000	\$0	\$463,000
East Channel	320	\$559,000	\$0	\$559,000
Indian Slough	625	\$988,000	\$0	\$988,000
Lake Onataska	2,750	\$2,064,000	\$0	\$2,064,000
Long Lake	40	\$649,000	\$0	\$649,000
Pool 11 Islands-Sunfish Lake	4,000	\$5,247,228	\$0	\$5,247,228
Pool 8 Islands Phase I	643	\$2,314,000	\$0	\$2,314,000
Pool 8 Islands Phase II	1,269	\$3,482,000	\$0	\$3,482,000
Pool 8 Islands Phase III	3,288	\$19,650,000	\$0	\$19,650,000
Pool 9 Islands	410	\$1,266,000	\$0	\$1,266,000
Small Scale Drawdown	80	\$97,000	\$0	\$97,000
Spring Lake Islands	530	\$3,695,000	\$0	\$3,695,000
Spring Lake Peninsula	30	\$448,000	\$0	\$448,000
Triempeau	5,487	\$5,835,000	\$0	\$5,835,000
<b>Total:</b>	<b>30,656</b>	<b>\$58,574,228</b>	<b>\$243,000</b>	<b>\$58,817,228</b>

Field Station	Total Cost
USGS - Upper Mississippi River Environmental Science Center	\$95,154,000
State of Wisconsin, La Crosse Biological Field Station	\$10,293,000



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Future Projects

Wisconsin



Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Capoli Slough	820	\$9,450,000	\$0	\$9,450,000
Lake Winneshiek	5,170	\$5,000,000	\$0	\$5,000,000
Lock & Dam 3	660	\$9,100,000	\$0	\$9,100,000
Lower Pool 10 Island and Backwater Complex	2,340	\$6,000,000	\$0	\$6,000,000
McGregor Lake	1,000	\$6,500,000	\$0	\$6,500,000
Snyder Slough Backwater Complex	2,064	\$16,800,000	\$0	\$16,800,000
Turkey River Bottoms Delta and Backwater Complex	3,638	\$18,700,000	\$0	\$18,700,000
<b>Total:</b>	<b>15,692</b>	<b>\$71,550,000</b>	<b>\$0</b>	<b>\$71,550,000</b>



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Other



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### Relationship of Weed Shiner and Young-of-Year Bluegill and Largemouth Bass Abundance to Submersed Aquatic Vegetation in Navigation Pools 4, 8, and 13

DeLain and Popp, An UMRR LTRMP Technical Report

**Methods:** LTRMP data for Pools 13, 8, upper & lower Pool 4, 1998–2012.

- Found significant relation between increases in % frequency of SAV and increases in CPUE of weed shiners, age-0 bluegills, and largemouth bass.
- Relation was significant for all 4 data sets combined, but not individually.
  - This is basically a meta analysis, that provides greater power due to greater range of % frequency of SAV.

### Relationship of Weed Shiner and Young-of-Year Bluegill and Largemouth Bass Abundance to Submersed Aquatic Vegetation in Navigation Pools 4, 8, and 13

DeLain and Popp, An UMRR LTRMP Technical Report

- Beyond a threshold of ~60-75% SAV, fish abundance was highly variable, indicating:
  - Factors other than SAV are important.
  - May be a point of too much SAV (needs more work).
- Work demonstrates that LTRMP sampling for SAV & fish is sufficiently robust for statistical investigation of relations between variables of the two components.

### 2014 Annual Meeting Upper Mississippi River Conservation Committee

Jeff Houser

Revisiting the UMR Comprehensive Master Plan: Long Term Resource Monitoring and Computer Inventory and Analysis

**The problem as identified in the Master Plan:**

Complex river system; Complex problems + Lack of information & communication = Resource management difficulties

- Recommended monitoring at levels much greater than what has been implemented.
- Is LTRMP fulfilling its purpose as outlined in the Master Plan?

Jeff Houser

Revisiting the UMR Comprehensive Master Plan: Long Term Resource Monitoring and Computer Inventory and Analysis

**Purpose of LTRMP:** collect scientifically & statistically valid data through time, & detect site-specific or system-wide changes.

- Collected & served valid, consistent data for 20+ years, over the wide gradient of system drivers. Filled many data gaps.
- Continuing to build systemic data for land cover & elevation.
- Provides baseline conditions to assess change over time at multiple scales, and for HREP planning.

Have largely met original purpose, for various components.

Gone beyond trends to greater understanding of how UMRS functions through work on ecological patterns, relations between variables, response to management, modeling, etc.

Entering new phase of using system manipulations (HREPs) to expand collaboration and ecological knowledge, as a compliment to long-term monitoring.

### Mississippi River Research Consortium, April 2014

19 UMRR-related papers (39 total)

+ keynote: Emily Stanley, UW-Madison, North Temperate Lakes LTER  
"Lessons from the Long View: Challenges and Opportunities with Long-Term Research in Aquatic Systems"

Word Cloud for titles of presentations



**USGS**  
@USGS

#WomeninScience Jennie Sauer works w/  
the USACE Upper Mississippi River  
Restoration program on [doi.gov/1j2PqOC](https://doi.gov/1j2PqOC)  
[pic.twitter.com/vzLPx1H0jq](https://pic.twitter.com/vzLPx1H0jq)

Reply Retweet Favorite Share



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UMRR-EMP

**Very recent activities  
(1 week ago)**

**Jennie Sauer makes  
Twitter!**

**Tweet received a  
number of comments  
and retweets = 10**

## EMP CC Quarterly Meeting May, 14 2014

Karen H. Hagerty  
UMRR Science/LTRM Project Manager  
MVR



US Army Corps of Engineers  
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## FY14 UMRR Science Support for Restoration

### Science Support Proposals

- Highest priority proposals with detailed SOWs, funded mid-Feb
- Second group of proposals approved and funded early April



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### FY14 Funded Science Support, 1<sup>st</sup> increment

Funded?	Cost	TITLE	Proponent
Y (MIPR Feb 2014)	\$113,276	Seamless elevation data	UMESC, Corps
Y (MIPR Feb 2014)	\$209,319	Land Cover / Land Use data and Accuracy Assessment/Validation for UMRS*	UMESC, Corps
NA (LTRM SOW, FS travel)	\$0	Science planning meeting in winter of FY14 (\$8,000 for FS travel in base SOW)	UMESC, Corps
Y (USACE labor S)	\$5,000	Development of Standardized HREP Non-Forested Wetland Plant Sampling Protocol	Corps
Y (USACE labor S)	\$5,000	Development of Standardized HREP Floodplain Forest Sampling Protocol	Corps
Y (MIPR Feb 2014, USACE labor+travel)	\$95,547	Predictive Model for Aquatic Cover Types	Corps
NA (work under base LTRM SOW )	\$0	Pool 12 Overwintering HREP adaptive management fisheries response monitoring	IA
<b>TOTAL</b>	<b>\$436,142</b>		



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## FY14 UMRR-EMP 2<sup>nd</sup> Increment Science Support for Restoration

- Final proposal review by A-Team (21 Feb)
  - ▶ Endorsement by email 27 Feb
- EMPCC concurrence via email, after EMPCC (early March)



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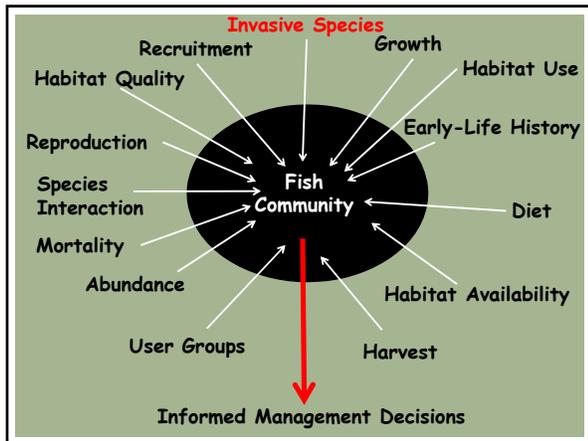
COST	Proposal Title	Proponent
\$48,648	UMRS Vegetation Handbook	UMESC
\$17,749	Phase 2 Geospatial Data Upgrades	UMESC
\$62,246	Spatial Data Query Tool	UMESC
\$61,689	UMRS Data Map	UMESC
\$37,064	Assessing system-wide hydrodynamic model availability to support ecosystem restoration	Corps
\$37,604	Development of vital rates to assess the relative health of UMRS mussel resources	UMESC
\$69,393	Validation of a Mussel Community Assessment Tool for the Upper Mississippi River System	UMESC
\$23,516	Effects of nutrient concentrations and zooplankton on phytoplankton abundance and community composition	WI, UMESC
\$20,221	Ecological Shifts in a Large Floodplain River during a Transition from a Turbid to Clear Stable State	WI
	1. Asian Carps Activities (#4) Invasive carp population demographics in the UMRS: an evaluation of the dynamic rate functions	MO
\$70,319	2. Asian Carps Activities (#5) Identifying recruitment sources of Asian carp	MO
\$28,428	3. Asian Carps Activities (#6) Effects of Asian Carp on the diets of native piscivores in the UMRS	MO
	4. Asian Carps Activities (#7) Early life history of invasive carp in the UMR Basin	MO
\$66,950	LTRMP FY14 equipment (WI airboat only, <i>estimated cost</i> )	WI, Corps
\$633,827	<b>SUBTOTAL (includes airboat estimate)</b>	

## FY14 UMRR-EMP Science Support for Restoration

- FUNDED (Feb) \$ 428,142
- FUNDED (Apr) \$ 566,877
- PENDING \$ 66,950
- **TOTAL \$1,061,969**



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## ASIAN CARP IN THE UPPER MISSISSIPPI RIVER BASIN

QUINTON E. PHELPS

## BACKGROUND

Two spp. of interest bighead carp silver carp (focus on silver carp)

Large-bodied planktivores

Introduced to control water quality in aquaculture ponds

Escaped (via flooding) and spread throughout the Midwestern U.S.

Carp can now be found in several states throughout the country

Bighead and Silver Carp WATCH

**How To Identify Bighead and Silver Carp (Invasive Species)**

**Bighead:** No dorsal fin, dorsal finless, head up, mouth wide open, scales on head.

**Silver:** Dorsal fin, dorsal fin up, mouth closed, scales on head.

**Warning:** Do not release, do not transport, do not feed, do not buy, do not sell, do not keep.

## SILVER CARP PERSIST IN MANY LOCATIONS

Rapid growth rates

Extensive migratory ability

Tolerate wide range of conditions

High fecundity

Lack of natural predators

Extremely efficient feeders

Short Generation Time

Great Invader...not good but true!

## WHAT ARE THE POTENTIAL IMPACTS ON AQUATIC SYSTEMS?

Silver carp may alter habitats and compete with native species leading to a disrupted system

However, because silver carp are a fairly recent invader...their effects largely remain unknown

## BECAUSE OF THE POTENTIAL PROBLEMS...

Much effort is being undertaken to evaluate these effects on aquatic systems where silver carp are highly recognized (Illinois River & Great Lakes)

But many other locations with persistent silver carp populations throughout the Upper Mississippi River system have not received attention despite the apparent relevance

## SO...MULTIPLE QUESTIONS IN THE UPPER MISSISSIPPI RIVER SYSTEM

First...What are the effects (if any) of silver carp on native fishes in the Mississippi River Basin?

Secondly...What are the effects of silver carp in Upper Mississippi River floodplain lakes?

If there is negative interaction between silver carp and native fishes, is competition the mechanism driving this relationship?



## OBJECTIVES

OBJ 1. Compare native planktivore relative abundance before and after invasion

OBJ 2. Evaluate short-term fish community changes in Mississippi River floodplain lakes with varying densities of silver carp

OBJ 3. Determine if competition exists between gizzard shad/bigmouth buffalo and silver carp in controlled setting



## STUDY AREA (OBJECTIVE ONE)

The Upper Mississippi River system has been sampled since 1993 using a standardized sampling approach

LTRM Element is composed of 6 field stations throughout the Mississippi River basin

Of the 6, the lower three have established silver carp populations (2003) while the upper three have not been fully invaded



## METHODS

To evaluate interspecific interactions in the Mississippi River electrofishing data for silver carp, bigmouth buffalo, and gizzard shad compiled from all 6 field stations from 1993-2013

For each spp. mean catch by year for each of the above species were calculated.

Beyond Before-After-Control-Impact analyses were used to compare abundance of silver carp, bigmouth buffalo, and gizzard shad before and after invasion.



## SVCP\*NATIVE FISH ASSOCIATIONS

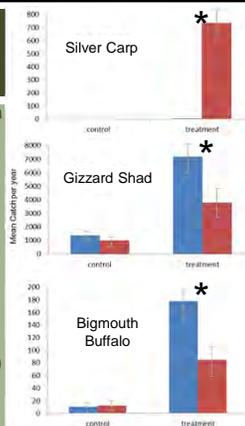
Blue bar represents pre invasion (prior to 2003) while red bar represents post invasion (after 2003)

Control is the upper three pools while the treatment sites are the three lower pools

No differences in control pre and post invasion

Differences in treatment group pre and post (\* significant 0.05)

Which indicates there may be problems

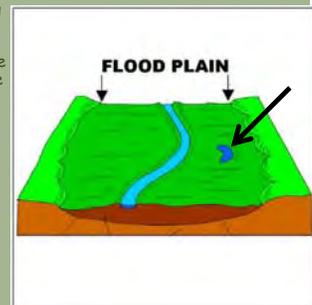


## SO...ARE ASIAN CARP NEGATIVELY INFLUENCING NATIVE FISHES IN THE MISSISSIPPI RIVER?

We have demonstrated using a comprehensive long-term data set that silver carp abundance is increasing while native planktivore abundance is declining...but more info is needed!

Which leads to the next objective...

Evaluate short-term fish community changes in Mississippi floodplain lakes with varying densities of SVCP



## METHODS (OBJECTIVE TWO)

During 2011, four Mississippi River floodplain lakes were sampled after floodwaters receded (early June) and ended in late October (5-month duration)

Relative abundance (CPUE) for each spp. was calculated. Note: Majority (>95%) of fish collected were YOY

Each of the floodplain lakes were categorized based on silver carp abundance (absent ~0/hr, low ~10/hr, moderate~100/hr, and high >100/hr)

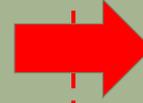
Changes in fish communities were compared with presence/absence data using only dominant taxa during our first and last sampling events



## CHANGES IN FLOODPLAIN FISH COMMUNITIES (SVCP ABSENT)

DOMINANT SPECIES PRESENT DURING FIRST SAMPLING EVENT

Gizzard Shad  
White Bass  
Bluegill  
Green Sunfish  
Largemouth Bass  
Smallmouth Buffalo



DOMINANT SPECIES PRESENT DURING LAST SAMPLING EVENT

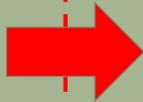
Gizzard Shad  
White Bass  
Bluegill  
Green Sunfish  
Largemouth Bass  
Smallmouth Buffalo

No change in the fish community when silver carp are absent

## CHANGES IN FLOODPLAIN FISH COMMUNITIES (SVCP LOW ABUNDANCE)

DOMINANT SPECIES PRESENT DURING FIRST SAMPLING EVENT

Flathead Catfish  
Silver Carp  
Gizzard Shad  
Bluegill  
Shortnose Gar  
Channel Catfish  
White Crappie  
Bigmouth Buffalo  
Common Carp



DOMINANT SPECIES PRESENT DURING LAST SAMPLING EVENT

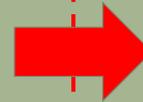
Flathead Catfish  
Silver Carp  
Gizzard Shad  
Bluegill  
Shortnose Gar  
Channel Catfish  
White Crappie  
Bigmouth Buffalo  
Common Carp

No change in fish community when silver carp are in low abundance

## CHANGES IN FLOODPLAIN FISH COMMUNITIES (SVCP MODERATE ABUNDANCE)

DOMINANT SPECIES PRESENT DURING FIRST SAMPLING EVENT

Silver Carp  
Bowfin  
Gizzard Shad  
Smallmouth Buffalo  
Bluegill  
Bigmouth Buffalo



DOMINANT SPECIES PRESENT DURING LAST SAMPLING EVENT

Silver Carp  
~~Bowfin~~  
~~Gizzard Shad~~  
Smallmouth Buffalo  
Bluegill  
Bigmouth Buffalo

Minor changes in fish community when silver carp are moderately abundant

## CHANGES IN FLOODPLAIN FISH COMMUNITIES (SVCP HIGH ABUNDANCE)

DOMINANT SPECIES PRESENT DURING FIRST SAMPLING EVENT

Silver Carp  
Sauger  
Gizzard Shad  
White Bass  
Bluegill  
Green Sunfish



DOMINANT SPECIES PRESENT DURING LAST SAMPLING EVENT

Silver Carp  
~~Sauger~~  
~~Gizzard Shad~~  
~~White Bass~~  
~~Bluegill~~  
~~Green Sunfish~~

Drastic changes in the fish community when silver carp are in high abundance

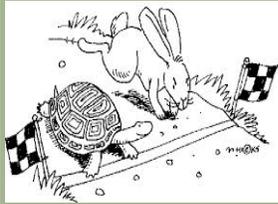
## SO...ARE SILVER CARP ALTERING FLOODPLAIN FISH COMMUNITIES?

We have shown using a fairly simplistic approach that as silver carp abundance increases the abundance of native fishes in floodplain lakes can decline or be eliminated over time!

At this point we have shown both in the river and its floodplain silver carp may have negative effects on native fishes...but we don't know what the mechanism is!!

Could be many mechanisms structuring these relations but...the current paradigm is competition for food

## WHICH LEADS TO MY THIRD OBJECTIVE...



Determine if competition exists between native planktivores and silver carp in the lab

Does competition occur either directly (interference competition; display agonistic behavior "bullying") or indirectly (exploitative competition; better at consuming prey)

## METHODS (OBJECTIVE THREE)

To evaluate competitive effects we captured similar sized YOY silver carp, bigmouth buffalo, and gizzard shad brought them back to the laboratory at ORWFS

After the acclimation period, all fish were weighed and equal densities of silver carp were put into tanks with either gizzard shad or bigmouth buffalo

Also had intraspecific controls (same densities above)

Fishes were fed maintenance ration (1%BW/d)

At the end of the 14-d trials, growth and survival for each species were evaluated

We also performed post-hoc behavioral experiments to further evaluate competitive effects



## EXPERIMENTAL RESULTS

Unable to detect intraspecific competition... but interspecific interactions existed... In the presence of silver carp, bigmouth buffalo had high survival (near 100 %) but had reduced growth (lost weight)

Gizzard shad in the presence of silver carp had very low survival (<10%) thus, growth was not interpretable

As for the type of competition occurring, we also noted that silver carp are not "bullies" or exhibiting agonistic behavior they are just more effective at consuming prey... thus exploitative competition is likely structuring the relations btw silver carp and native planktivores



## WHAT DOES ALL OF THIS MEAN?

Based on the many analyses that we have completed under the LTRM element... Multiple lines of evidence suggest Asian carp may be impacting fish community composition and thus historic function (i.e., pre invasion);

Therefore we need to further understand how these species are altering the system

This ties in nicely because a primary goal of the UMRR-EMP is to restore ecosystem structure and function.

So what's next?

## PROPOSED EFFORT

We have recently proposed 4 projects to more fully understand the influence of Asian carp in the UMRS including HREPs.

1. Invasive carp population demographics in the Upper Mississippi River System: An evaluation of the Dynamic Rate Functions (potential management strategies that could effectively minimize effects on the UMRS)
2. Identifying recruitment Sources of Asian carp inhabiting the Upper Mississippi River (what stretches of the UMRS are most important to reproduction of invasive carp?)
3. Effects of Asian carp on the diets of native piscivores in the Upper Mississippi River System (has diet of our native piscivores changed since invasion and does this change community composition?)
4. Early life history of invasive carp in the Upper Mississippi River (ELH plays a key role in recruitment and understanding invasive carp during this time period may provide insight to mgmt)

## IN A NUTSHELL...

These proposals as a whole provide a continuum of how Asian Carp alter the UMR systemically through their various life stages (adult, juvenile, larval) and the associated factors that influence (associations with native fishes) the overall population.

At the end of these projects, we plan to take advantage of the ecological knowledge garnered during these studies and put this information into use to help manage the UMRS

## ACKNOWLEDGEMENTS

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## Upper Mississippi River Restoration (EMP)

Mississippi Valley Division St. Louis District

**Tim Eagan**  
Program Manager  
St. Louis District  
14 May 2014





## ST. LOUIS DISTRICT (MVS)

### FY14 HREP Work Plan (14 May 2014)

<p><b>PLANNING</b></p> <p><b>Rip Rap Landing, IL</b></p> <ul style="list-style-type: none"> <li>&gt; DQC Complete, Public Open House 4<sup>th</sup> QTR Fy14</li> </ul> <p><b>Clarence Cannon Refuge, MO</b></p> <ul style="list-style-type: none"> <li>&gt; Division Final Review</li> </ul> <p><b>Piasa and Eagles Nest Islands, Pool 26, IL</b></p> <ul style="list-style-type: none"> <li>&gt; Draft DPR 2<sup>nd</sup> QTR FY15</li> </ul> <p><b>Other studies in the Queue</b></p> <ul style="list-style-type: none"> <li>&gt; Middle River Opportunities MO/IL</li> <li>&gt; Glades &amp; Godar, IL River</li> <li>&gt; Horseshoe Lake, IL</li> <li>&gt; West Alton, MO</li> <li>&gt; Pool 24, MO</li> </ul>	<p><b>DESIGN</b></p> <p><b>Ted Shanks, MO</b></p> <ul style="list-style-type: none"> <li>&gt; CN1/CS3 Water Control</li> <li>&gt; Nose Slough/Deadman WC</li> <li>&gt; Pump Station</li> </ul> <p><b>CONSTRUCTION</b></p> <p><b>Ted Shanks, MO</b></p> <ul style="list-style-type: none"> <li>&gt; SR1 Water Control</li> <li>&gt; North Berm and Setback</li> <li>&gt; HL1 Water Control</li> </ul> <p><b>Pools 25 &amp; 26 Islands, MO</b></p> <ul style="list-style-type: none"> <li>&gt; Bolters Island - Punchlist</li> </ul> <p><b>Batchtown, IL - Punchlist</b></p> <p><b>EVALUATION</b></p> <ul style="list-style-type: none"> <li>Baseline Monitoring</li> <li>Post Project Monitoring</li> <li>Performance Evaluation</li> </ul>
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## Ted Shanks, MO HREP




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## Clarence Cannon National Wildlife Refuge

### Habitat Rehabilitation and Enhancement Project

Pool 25 Mississippi River  
Miles 261.1 – 263.8  
Pike County, MO

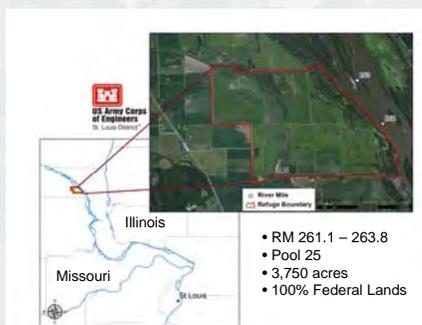
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14 May 2014






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## Project Location



- RM 261.1 – 263.8
- Pool 25
- 3,750 acres
- 100% Federal Lands



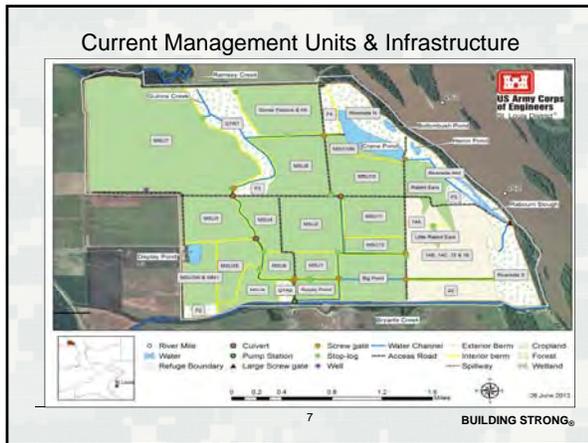
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## Problems and Opportunities

Problems	Opportunities
Loss of native plant communities	Increase acreage of & connectivity between native plant communities while reducing acreage of invasive plant species
Invasive species colonization	
Habitat fragmentation	
Lack of floodplain connectivity	Restore floodplain connectivity between the Mississippi River and the project area
Shallow water in backwaters and loss of historic meanders	
Site water regime no longer follows historic water regime which native flora and fauna are adapted to	Improve water delivery and drainage to the refuge to simulate pre-impoundment hydrograph



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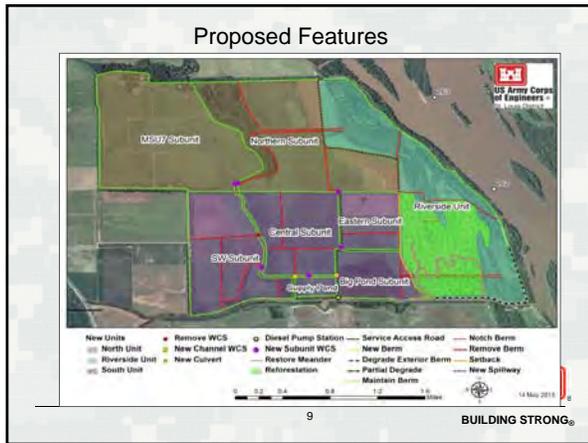


### Future Without Project

- Inadequate water management capabilities**
  - Spread of invasive species
  - Prolonged inundation after overtopping flood events
  - Inability to promote native wetland plant species for wetland wildlife
- Fragmented habitat**
  - Inability to provide resources required for wetland species
- Lack of floodplain connectivity**
  - Prevents access of spawning, rearing, and foraging habitats for riverine species
  - Eventual loss of backwater sloughs and lakes

➔ **continued reduction in aquatic ecosystem structure & function**

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### Tentatively Selected Plan (TSP)

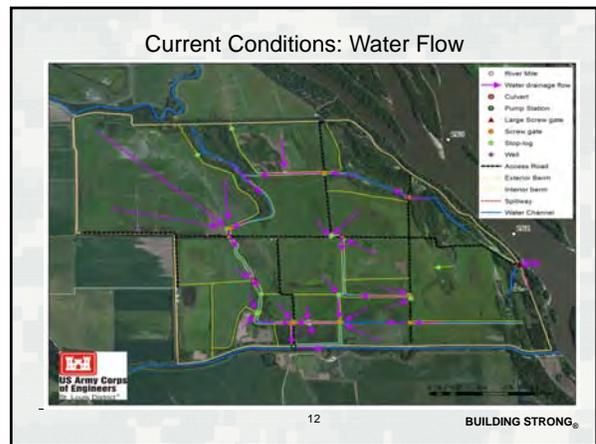
- South Unit**
  - 5 subunits converted into 1
  - Berm degrades/removals (4)
  - Water control structures (3)
  - Native plantings
- North Unit**
  - 2 Subunits converted into 1
  - Berm Removals (2)
  - Water control structures (3)
  - Native plantings

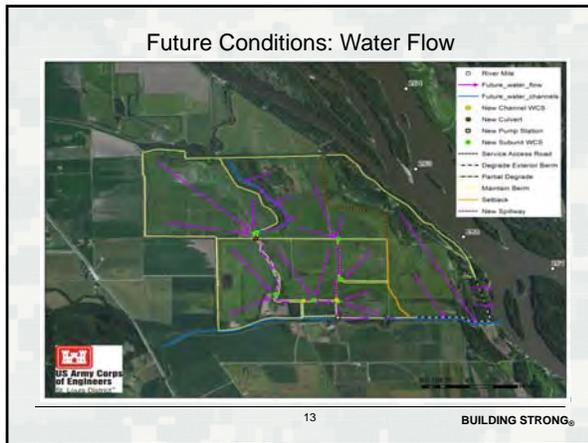
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### TSP continued

- Riverside Unit**
  - Berm Degrade (1)
  - Native plantings
- Levee Setback with exterior berm degrade**
  - Spillway
- Diesel pump station**
  - 2 pumps
  - 2 gravity drains
  - Delivery channel WCS (3)
- Historic meander excavation**
- Reforestation**

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## Questions?

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## Horseshoe Lake

### Habitat Rehabilitation and Enhancement Project

Mississippi River Miles 34-38  
Alexander County, IL

**Tim Eagan**  
Program Manager  
St. Louis District  
14 May 2014

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## Horseshoe Lake

### Alexander County, IL

### Upper Mississippi River Miles 34-38

- Quick Facts
  - ▶ Conservation Area managed by IDNR
  - ▶ Approximately 10,200 Acres
  - ▶ Oxbow lake created by Mississippi River
- Problems
  - ▶ Degradation of unique ecosystem
    - Bald Cypress & Tupelo Gum
  - ▶ Sedimentation accretion negatively impacting habitat for wetland and aquatic species
  - ▶ Limited ability to manage water
- Risk
  - ▶ Continued degradation to a rare ecosystem within the Upper Mississippi River
- Opportunities
  - ▶ Utilize data and information from draft report completed under the CAP program

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