Upper Mississippi River Restoration Program
Coordinating Committee
Quarterly Meeting

May 6, 2015

Highlights and Action Items

Program Management

- **UMRR's FY 15 work plan has been slightly revised since the February 11, 2015 quarterly meeting.** The program's updated internal allocations are as follows:
  - Regional Administration and Programmatic Efforts – $861,000
  - Regional Science and Monitoring – $8,126,000
    - Long term resource monitoring – $5,495,000
    - Regional science in support of restoration – $1,907,000
    - Regional science staff support – $69,000
    - Habitat project evaluations – $655,000
  - Habitat Restoration – $24,183,000
    - Regional project sequencing – $70,000
    - MVP – $7,234,000
    - MVR – $9,645,000
    - MVS – $7,234,000
- **The House's FY 16 energy and water appropriations bill includes $19.787 million for UMRR, matching the President's budget request.** This represents a decrease of $13.383 million from FY 15, and is a result of increased competition from other USACE ecosystem restoration projects for construction funding, particularly the Everglades. The final FY 16 appropriation is unknown.
- District staff are developing recommendations for UMRR's FY 17 budget. As a next step, the three UMR Districts and MVD will discuss budget priorities before submitting the proposal to Headquarters for review.
- Dru Buntin and Gretchen Benjamin discussed their visits with House members and the Administration this spring. There is strong bipartisan support for UMRR. Several UMR House delegation members submitted FY 16 appropriations requests to fund UMRR at its full annual authorized level of $33.17 million. However, the requests were denied since they are considered earmarks by the House's rules, which define earmarks as any increase in funding above the President's budget for a program or project. Buntin and Benjamin said they are hopeful that the final FY 16 appropriations act will include additional funding for USACE's ecosystem restoration programs that could then be allocated to UMRR in the Administration's FY 16 work plan. They are planning to encourage UMR Senate delegation members to add that additional funding allocation, and then will request that the Administration allocate money to UMRR to restore its full annual authorized funding. The Administration has expressed its support of the program, asking District staff for more specific information on optimal spending associated with various funding scenarios. In addition, the Administration emphasized the importance of completing projects and explaining how the science contributes to understanding the ecosystem and restoration approaches.

- Under the $19.787 million funding scenario, internal program allocations would be as follows:
  - Regional Administration and Programmatic Efforts – $741,000
  - Regional Science and Monitoring – $6,567,000
    - Long term resource monitoring – $4,500,000
    - Regional science in support of restoration – $963,000
    - Regional science staff support – $129,000
    - Habitat project evaluations – $975,000
  - Habitat Restoration – $12,479,000
    - Regional project sequencing – $100,000
    - MVP – $3,425,000
    - MVR – $4,745,000
    - MVS – $4,209,000

    [Note: The District HREP funds are not reflective of the historical split based on river mileage, and instead are reflective of on the project priorities as identified in the budget process.]
- **Possible sequestration is scheduled to take effect on October 1, 2015 per the 2011 Budget Control Act. Should this occur, UMRR would receive a five percent cut from its final FY 16 appropriation.**
- Marv Hubbell convened conference calls on February 19, 2015 and March 24, 2015 with the long term resource monitoring field stations leaders, UMESC, UMRR Coordinating Committee members, and UMRBA staff regarding FY 16 budget planning. **The UMRR Coordinating Committee expressed support for using this forum to continue budget discussions.**
- The strategic operational planning team held conference calls on April 9 and April 28 to refine implementing actions for Goals 1 and 2 of the FY 15-25 UMRR Strategic Plan. **The team's next call is scheduled for May 26 to discuss Goals 3 and 4. The team will then share the draft operational plan with partners for review.**
- **UMRR Coordinating Committee members suggested reviewing UMRR's HREP planning and design process, incremental cost-benefit analyses, and project partnership agreements through a Lean Six Sigma continuous improvement evaluation. By May 29, partners are requested to send Marv Hubbell any additional recommendations for programmatic areas to address through Lean Six Sigma.**
- USACE issued a contract with UMRBA to write and publish the 2016 UMRR Report to Congress (RTC). A first draft plan is scheduled to be distributed for partner review in August 2015, with a second review anticipated for late December 2015. Headquarters' and MVD's official review is scheduled for spring 2016, with a final report incorporating graphics submitted to Headquarters in November 2016. **UMRR Coordinating Committee members agreed to include policy recommendations related to project partnership agreements and the UMRR/NESP Transition Plan in the RTC.**
- Kevin Bluhm proposed objectives and a process for developing outreach messages and images. **A communications committee will be convened in June to lead the effort, but will involve program partners as the messages, images, and tools are developed. Bluhm asked partners to contact him if they are interested in participating on the team by May 29.**

Habitat Rehabilitation and Enhancement Projects

- MVS's current planning priorities are Rip Rap Landing, Piasa and Eagles Nest Islands, and Harlow and Wilkinson Islands. The District is continuing design on Clarence Cannon and Ted Shanks and construction on Ted Shanks and Pools 25 and 26 Islands. Batchtown will likely be completed this summer.

- MVP is planning to complete the feasibility report for North and Sturgeon Lake this fiscal year. The District initiated construction on Harpers Slough this spring and plans to finalize construction on Capoli Slough Islands this fall.

- MVR is maintaining an aggressive habitat project schedule, with five projects in planning, two in design, and six in construction.

- Bryan Hopkins requested that a presentation is given at a future UMRR Coordinating Committee meeting about the northern long-eared bat's use of the program's habitat projects, and how the species' listing might affect the construction of projects.
- Marv Hubbell and Tim Yager discussed how the Pool 12 Overwintering habitat project underscored the need to better document and understand decision points in the planning and design process. In addition, planning for the project generated interest in exploring how UMRR can better address emerging or increasing ecological problems that are affecting the river's ecological health and resilience, such as sedimentation, floodplain forest diversity, and climate change.
- **USACE has executed a contract with USGS to lead an interdisciplinary team that will define indicators of ecosystem health and resilience and link the indicators to the process of identifying habitat projects. It is anticipated that the team will begin this effort in spring or summer 2015 and complete the project at the end of FY 17. USGS is currently soliciting applications for a part time staff person to lead this effort.**
- **A team to identify the next generation of habitat projects will be convened in fall 2015.**
- Tim Eagan presented on the potential designs of three Open River restoration opportunities, including Harlow Island, Cranes Island, and Wilkinson Island.

Long Term Resource Monitoring Element

- A completion report was published that describes the spatial and temporal dynamics of submersed aquatic vegetation (SAV) and metaphyton communities in Pool 4. The research concluded that there has been a community shift over time of native SAV species increasing in richness and abundance. The research shows that vegetation communities can better recover when river conditions improve.

- A seamless elevation data set, named "topobathy," has been developed that merges LiDAR and bathymetry data.

- UMESC hosted a long term resource monitoring component meeting in La Crosse on April 14-15, 2015. One primary objective was to ensure consistent sampling methods are being applied across field stations in order to maintain high data integrity.

- In FY 15, the program's science in support of restoration will include research, analysis, model development, and identification of resilience indicators.

- The UMRR Coordinating Committee has finalized an invasive species policy for the program. The policy's primary purpose is to communicate to implementing partners about UMRR's roles and responsibilities related to invasive species.

- Shawn Giblin explained his intentions, as the new A-Team Chair, to focus the Team's discussions on data syntheses, such as threshold analyses and defining measurable outcomes to improve the river's ecological integrity.

- Quinton Phelps presented analyses of UMRR's monitoring data showing the impacts of Asian carp on native fish species by comparing pools with high, moderate, and no abundance of Silver carp, as well as pre- and post-invasion data.

Other Business

- **Upcoming quarterly meetings are as follows:**
  - **August 2015 — La Crosse**
    - UMRBA meeting — August 4
    - **UMRR Coordinating Committee — August 5**
  - **November 2015 — St. Paul**
    - UMRBA meeting — November 17
    - **UMRR Coordinating Committee — November 18**
  - **February 2016 — Quad Cities**
    - UMRBA meeting — February 23
    - **UMRR Coordinating Committee — February 24**

UMRR CC Quarterly Meeting
May 6, 2015

Marvin E. Hubbell - MVR
UMRR Regional Program Manager

Mississippi Valley – Rock Island District (MVR)
Mississippi Valley – St. Louis District (MVS)
Mississippi Valley – St. Paul District (MVP)

US Army Corps of Engineers
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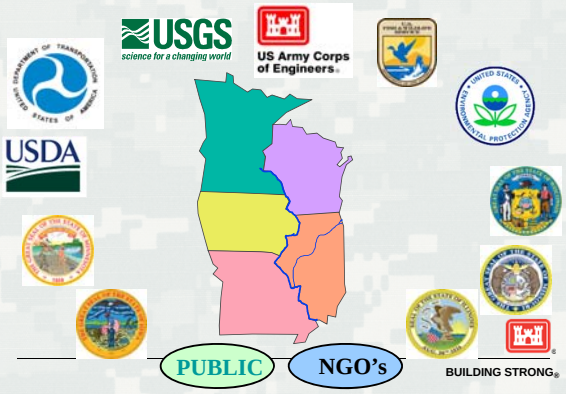
UMRR Program Partners



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FY15 Revised Work Plan

TOTAL FY15 Program	**$33,170,000**
Regional Administration and Program Efforts	**$ 861,000**
Regional Management	$ 534,000
Program Database	$ 116,000
UMRR Program Strategic Plan	$ 25,000
Program Support Contract (UMRBA)	$ 76,000
Public Outreach*	$ 35,000
2016 Report to Congress	$ 75,000
Regional Science and Monitoring	**$ 8,126,000**
LTRM (Base Monitoring)	$ 5,495,000
UMRR Regional Science In Support Rehabilitation/Mgmt. (MIPR's, Contracts, and Labor)	$ 1,907,000
UMRR Regional Science Staff Support (Integration)	$ 69,000
Habitat Evaluation (Including PER's)	$ 655,000
District Habitat Rehabilitation Efforts (Planning and Construction)	**$24,183,000**
Rock Island District	$ 9,645,000
St. Louis District	$ 7,234,000
St. Paul District	$ 7,234,000
Regional Project Sequencing	$ 70,000

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FY 16 Budget Request

- President's Budget $19,787,000
- House $
- Senate $
- Presidents FY16 budget announced Feb.2
  - ►Reduction from FY15 - $13,383,000
- Corps working on FY15 Work plan
- FY17 budget request being developed

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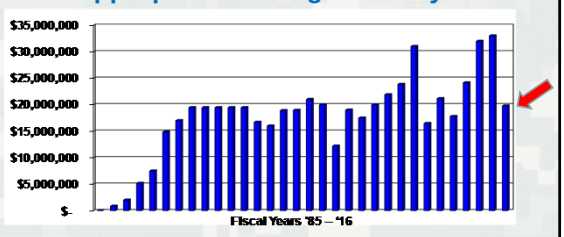
UMRR Program Appropriation/Budget History



Fiscal Years 1985 through 2016

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Tentative FY16 Work Plan

TOTAL FY16 Program	**$19,787,000**
Regional Administration and Program Efforts	**$ 741,000**
Regional Management	$ 495,000
Program Database	$ 95,000
Program Support Contract (UMRBA)	$ 76,000
Public Outreach	$ 60,000
2016 Report to Congress	$ 15,000
Regional Science and Monitoring	**$ 6,567,000**
LTRM (Base Monitoring)	$ 4,500,000
UMRR Regional Science In Support Rehabilitation/Mgmt. (MIPR's, Contracts, and Labor)	$ 963,000
UMRR Regional (Integration, Adapt. Mgmt, model cert.)	$ 129,000
Habitat Evaluation	$ 975,000
District Habitat Rehabilitation Efforts (Planning and Construction)	**$12,479,000**
Rock Island District	$ 4,745,000
St. Louis District	$ 4,209,000
St. Paul District	$ 3,425,000
Regional Project Sequencing	$ 100,000

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UMRR Science for 2016

- **2 SOWs in FY16**
  - ►SOW for base data collection **$4.5M**
  - ►SOW for science in support of restoration **$.963M**
  - ►Sequestration = **5%??**

Both SOWs <u>together</u> are equivalent to a fully funded UMRR LTRM element

FY2016 Budget Planning

- **Conf Calls**
  - ►Feb 19, 2015
  - ►March 24
  - ►Hubbell via conf call at A-Team and LTRM component meetings in April
  - ►May 1: Email with timeline

Upcoming Milestones

- **May 8:** 2 SOW skeletons for feedback
- **June 1:** budget and proposal guidance
- **June 30:** draft LTRM budgets due
- **July 30:** analysis under base items due
- **Sept 9:** final SOWs due

LTRM Low Funding Ad Hoc

- Original Ad Hoc Team (2012):
  - ► Hubbell, Hagerty (USACE)
  - ► Johnson, Sauer (USGS)
  - ► Yager, Clevenstine (USFWS)
  - ► Popp, Chick (field stations)
  - ► Ford, Sternburg (EMP-CC state members)
  - ► Short (A-Team)
  - ► Mickelsen (UMRBA staff)
  - ► Field station team leaders invited

UMRR Program Strategic Plan Key Points

- First formal Program Vision
- First formal Mission Statement
- Four Goal Statements
  - ►Enhance Habitat for Restoring and Maintaining a Healthier and More Resilient UMRS.
  - ►Advance Knowledge for Restoring and Maintaining a Healthier and More Resilient UMRS
  - ►Engage and Collaborate with Others
  - ►Utilize a Strong, Integrated Partnership

Operational Plan

- Purpose
  - ►Make recommendations to the UMRR Program Coordinating Committee for implementing Strategic Plan.
  - ►Objectives:
    - Establish priorities
    - Identify key policy and technical issues
    - Integration of science and restoration efforts
    - Identifying challenges for implementation

Operational Plan

- Challenges
  - ►Level of detail
  - ►How to clearly link to the Strategic Plan and budget.
- Some key recommendations being considered:
  - ►Communication Plan
  - ►Habitat Team
  - ►Update HNA
  - ►~~Transparency~~

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Operational Plan

- UMRR EMP-CC Adoption the Strategic Plan on Nov. 19
  - ►Amended the Plan by adding "an explicit intention to develop an implementation plan".
- An 11 member Committee was created in response and held it's first meeting on Jan. 20-22.
- Second meeting on April 9, 2015
- Anticipated completion Sept. 2015

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Operational Plan

- Key Outcomes of the 2nd meeting
  - ► Recommended format of O Plan
  - ► Finalized Goal 2 (Advance Knowledge for restoring and maintaining a healthier and more resilient UMRS ecosystem)
  - ►Providing a context for how we will engage the public (Goal 3) to further Goals 1 and 2.
    - Discussion of Goal 3 under the 9:10 agenda topic
  - ►Describing preamble:
    - Highly modified ecosystem
    - Relationship between the Strategic and Operational Plans

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Lean Six Sigma

- Schedule:
  - ►Feb. - Overview of Lean Six Sigma
  - ►May – Identification of possible management issues to be addressed
  - ►May - July – Identify one or more key issues
  - ►August – Identify priority issues to be addressed.
  - ►September – Develop strategy to address priority issues then address key issues.
- Systematic process for continuous improvement of key business processes.

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Lean Six Sigma

- General Topics
  - ▸ Regional Issues
    - Technical Management Coordination
  - ▸ Science
    - Monitoring Research Coordination Integration
  - ▸ Habitat Restoration
    - Plan formulation Construction Post Construction Integration

2016 Report to Congress

- 2015 Schedule
  - ▸ Feb. - Complete contract with UMRBA
  - ▸ **Feb. Quarterly Meeting**
    - **Initiate discussion on outline and identification of programmatic and policy issues (IIA issues)**
  - ▸ Feb. to Aug. - Prepare 1st Draft of RTC
  - ▸ Aug. - Submit 1st Draft RTC for review
  - ▸ Dec. – Submit 2nd Draft RTC for review

2016 Report to Congress

- 2016 Schedule
  - ▸ Feb. – Send final draft to Partners for final review.
  - ▸ March to May – Official MVD and HQ review
  - ▸ Sept. to Nov. – Design and graphics
  - ▸ Nov. 15 – Submit final RTC to MVD and HQ

2016 Report to Congress

- Progress since Feb. meeting
  - ▸ Finalized contract with UMRBA to edit, write, and publish the 2016 RTC
  - ▸ Developed outlines for each of the major headings in the report.
  - ▸ Currently working on the Enhancing Knowledge Chapter.
    - Identifying key points and presenting data, processes, infra structure to demonstrate importance.

2016 Report to Congress

- Outline
  - ▸ Forward
  - ▸ Executive Summary
  - ▸ Table of Contents
  - ▸ History and Background
  - ▸ Chapter 1 – Enhancing Habitat
  - ▸ Chapter 2 – Enhancing Knowledge
  - ▸ Chapter 3 – Interagency Partnership
  - ▸ Chapter 4 - Implementation Issues
  - ▸ Chapter 5 - Conclusions and Recommendations

2016 Report to Congress

- Engaging Partners in the development of the RTC

2016 Report to Congress

- Draft Policy Recommendation Statements
  (Pages B-7 to B-9)
  - ►Project Partnership Agreements (PPA)
  - ►UMRR-NESP Transition Plan

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Strategic and Operational Plan Goal 3

- Goal 3 - Engage and collaborate with other organizations and individuals to accomplish the UMRR vision.
- Initial Recommendations
  - ►Establish a Communication Committee
  - ►Develop Communications Plan

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Initial Staffing of the Communication Team

- Kevin Bluhm
- Randy Hines
- Karla Sparks
- FWS
- Volunteers

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Draft Initial Steps of the Communications Plan

- Kevin Bluhm
- Page C-1

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Public Communications and Outreach

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UMRRP Habitat Rehabilitation and Enhancement Projects

As of February 2015:
55 Projects Completed
8 Projects in Construction
27 Projects in Design

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ST. LOUIS DISTRICT (MVS)
FY15 HREP Work Plan (May 2015)

PLANNING

Rip Rap Landing, IL
- Final Draft Feasibility complete waiting on sponsor letter of support *$200k*

Piasa and Eagles Nest Islands, Pool 26, IL
- Continue feasibility *$350k*
- Develop physical model

Harlow MO /Wilkinson IL Islands, Middle River
- Initiate feasibility *$400k*

Other studies in the Queue *$200k*
- Glades & Godar, IL River
- West Alton/Missouri Islands

EVALUATION *$150k*
Baseline Monitoring
Post Project Monitoring
Performance Evaluation

DESIGN

Clarence Cannon Refuge, MO *$1100k*
- Berm Setback
- Pump Station
- South Unit water control & channels
- North Unit water control & berm degrades

Ted Shanks, MO *$500k*
- Pump Station

CONSTRUCTION

Ted Shanks, MO *$3950k*
- SR1 Water Control
- North Berm and Setback
- HL1 Water Control
- NS1,NS2, DS Water Control
- Channel and Berm Earthwork

Pools 25 & 26 Islands, MO
- Bolters Island *$100k*

Batchtown, IL – Punchlist *$100k*

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New MVS Commander HREP Site Visit

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ST. PAUL DISTRICT (MVP)
FY15 HREP Work Plan (6 May 2015)

PLANNING – in priority order…..

North & Sturgeon Lakes, Pool 3, MN – ($400k)
- Complete Feasibility

Conway Lake, Pool 9, IA – ($350k)
- Complete Draft Feasibility

McGregor Lake, Pool 10, WI – ($150k)
- Continue Draft Feasibility

Other studies in the Queue
- Pool 10 Islands
- Lake Winneshiek (Pool 9),
- Weaver Bottoms (Pool 5),
- Clear Lake (Pool 5),
- Bass Lake Ponds (Mn Valley),

CONSTRUCTION

Capoli Slough Islands, Pool 9, WI ($250k)
- Stage 1 - Newt Marine
- Stage 2 - McHugh/JF Brennan
- Project dedication in fall

Harpers Slough, Pool 9, IA ($12.3M)
- Stage 1 - Newt Marine
- Started work early April

EVALUATION
- Baseline Monitoring
- Post Project Monitoring
- Performance Evaluation
  - Lansing Big Lake
  - Ambrough Slough
  - Bank Stabilization

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Contractor Placing Granular Material on Island M5 Access pad

ROCK ISLAND DISTRICT (MVR)
FY15 HREP Work Plan (Feb. 2015)

PLANNING
- Keithsburg Division, Pool 18, IL **($196K)**
- Emiquon East, LaGrange Pool, IL **($60K)**

DESIGN
- Pool 12 Overwintering Stage II, Pool 12 IL **($280K)**

CONSTRUCTION
- Lake Odessa Flood Recovery, IA Pools 17 and 18, IA **($350K + L $410K)**
- Pool 12 Overwintering Stage I, Pool 12 IL **(L $140K)**

EVALUATION
- FWS **(L $205K)**
- Baseline Monitoring
- Adaptive Mgmt. Pool 12
- Snyder Slough Backwater, Pool 11, WI **($20K)**
- Beaver Island, Pool 14, IA **($540K)**
- **Boston Bay, Pool 18, IL ($75K)**
- Huron Island Stage II, Pool 18, IA **($220K)**
- Fox Island, Pool 20, MO **(L $100K)**
- Rice Lake Stage I, IL LaGrange Pool **($130K + L $85K)**
- Huron Island Stage I, Pool 18, IA **(L $360K)**
- Pool 12 Overwintering Stage II, Pool 12 IL **($3.5M - $9M)**
- Post Project Monitoring
- Performance Evaluations **($250K)**
  - Bay Island
  - Andalusia
  - Brown's Lake

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Pool 12 Sunfish Lake Reshaping

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Huron Island

Huron Island

Pool 12

- Communications
- Decision Points
- Evolving Management Objectives

Linking Indicators of Health and Resilience and Next Generation of Projects

- Strategic Mission and Vision Statement

Indicators of Health and Resilience

- April 2015 Award MIPR for indicators of ecosystem health and resiliency.
  - ►Establish Interdisciplinary Team
  - ►Develop work plan

Indicators of Ecosystem Health and Resilience

- Next Steps
  - ►Health and Resiliency Schedule
    - Formal start – 3rd Quarters FY15
      - ▷ Develop Outline
      - ▷ assemble key data sources
      - ▷ Conceptual linkage of indicators with the identification of the next generation of rehabilitation efforts
    - Completion – 4th Quarter FY17

Next Generation of Projects

- 1st Quarter FY16 - Establish the team for the next generation of Projects.
- Next Steps
  - ▶ Schedule
  - ▶ Formal start – 1st Quarter FY16
    - ▷ Develop Outline
    - ▷ assemble key data sources
    - ▷ Identify perspective members of SET
    - ▷ Link rehabilitation efforts updating the HNA (refined goals, objectives, indicators, and data from base monitoring)
  - Completion – 4th Quarter FY17

Mud Lake Pool 11 July 2006

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
Calhoun Point	2,135	$10,764,000	$0	$10,764,000
Chautauqua Refuge	3,940	$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
Total:	**37,218**	**$71,165,000**	**$3,644,000**	**$74,809,000**

Field Station	Total Cost
National Great Rivers Research & Education Center Biological Field Station	$ 8,783,000
Illinois River Biological Field Station	$ 8,783,000
Total Science & Monitoring	**$17,566,000**

Future Projects — **Illinois**

Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Batchtown	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
Red'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
Total:	**32,225**	**$132,881,000**	**$408,000**	**$133,289,000**

Completed Projects — **Iowa**

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
Total:	**24,041**	**$41,826,920**	**$391,000**	**$42,217,920**

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

Future Projects — **Iowa**

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
Total:	**14,251**	**$74,290,000**	**$0**	**$74,290,000**

Completed Projects — Minnesota

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
Total:	**9,729**	**$28,045,000**	**$175,000**	**$28,220,000**

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

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Future Projects — Minnesota

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
Total:	**11,134**	**$26,500,000**	**$0**	**$26,500,000**

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Completed Projects — Missouri

Project Name	Acres Restored	Federal Cost	Non-Federal Cost	Total Cost
Bay Island	650	$3,112,000	$0	$3,112,000
Clarksville Refuge	312	$454,000	$0	$454,000
Cuivre Island	2,180	$1,444,000	$479,000	$1,923,000
Dresser Island	940	$2,904,000	$0	$2,904,000
Monkey Chute	88	$56,000	$0	$56,000
Pharrs Island	525	$2,783,000	$0	$2,783,000
Stag and Keaton Islands	470	$471,000	$0	$471,000
Total:	**5,165**	**$11,224,000**	**$479,000**	**$11,703,000**

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

BUILDING STRONG®

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
Ted 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
Total:	**27,271**	**$111,582,000**	**$**	**$111,582,000**

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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	$166,000	$2,627,000
Bertom Mccartney Lakes	2,000	$2,440,000	$0	$2,440,000
Blackhawk Park	82	$232,000	$77,000	$309,000
Cold Springs	30	$463,000	$0	$463,000
East Channel	320	$559,000	$0	$559,000
Indian Slough	825	$988,000	$0	$988,000
Lake Onalaska	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	1,268	$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	$3,895,000	$0	$3,895,000
Spring Lake Peninsula	30	$448,000	$0	$448,000
Trempeleau	5,487	$5,835,000	$0	$5,835,000
Total:	**30,056**	**$58,574,228**	**$243,000**	**$58,817,228**

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
Total:	**15,692**	**$71,550,000**	**$0**	**$71,550,000**

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UMRR LTRM Report

St. Louis, MO
May 2015

Analysis of Spatial and Temporal Dynamics of Submersed Aquatic Vegetation and Metaphyton Communities of Pool 4, Upper Mississippi River (1998–2011)

Megan Moore: MNDNR, Lake City MN

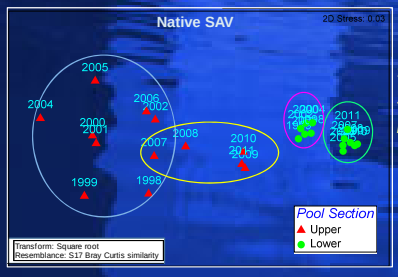
Analysis of Spatial and Temporal Dynamics of Submersed Aquatic Vegetation and Metaphyton Communities of Pool 4, Upper Mississippi River (1998–2011)

Objectives

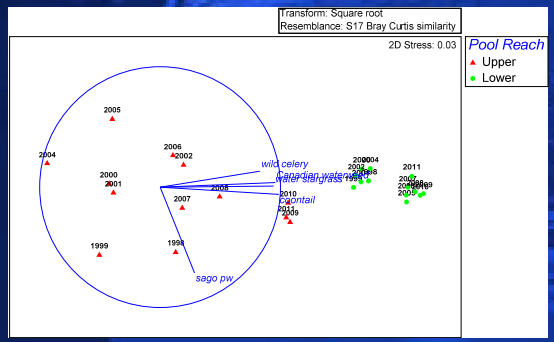
1. Provide detailed baseline information regarding native aquatic vegetation communities in the upper and lower reaches of Pool 4
2. Determine how the vegetation communities have changed over time
3. Determine which environmental factors have influenced these changes.

Megan Moore: MNDNR, Lake City MN

Pool 4 SAV community dynamics



2-way crossed ANOSIM
Reach: R=0.995, p<0.001
Time period: R=0.755, p<0.001



Environmental Variables	Upper Pool 4		Lower Pool 4	
	Early period	Late period	Early period	Late period
spring turbidity (NTU)	24.26 (±2.06)	20.63 (±1.36)	7.65 (±0.83)	7.00 (±0.47)
summer turbidity (NTU)	**34.01 (±2.39)**	**20.00 (±1.36)**	**9.38 (±0.79)**	**7.41 (±0.50)**
spring total nitrogen (mg/L)	3.6 (±0.31)	3.62 (±0.23)	**2.58 (±0.24)**	**3.59 (±0.25)**
summer total nitrogen (mg/L)	3.65 (±0.21)	3.03 (±0.26)	3.39 (±0.24)	2.83 (±0.21)
spring total phosphorus (mg/L)	0.135 (±0.005)	0.124 (±0.008)	0.098 (±0.007)	0.097 (±0.007)
summer total phosphorus (mg/L)	**0.173 (±0.004)**	**0.152 (±0.008)**	0.167 (±0.020)	0.176 (±0.013)
spring soluble reactive phosphorus (mg/L)	0.014 (±0.003)	0.02 (±0.004)	0.022 (±0.004)	0.021 (±0.004)
summer soluble reactive phosphorus (mg/L)	0.044 (±0.003)	0.036 (±0.004)	0.057 (±0.006)	0.080 (±0.012)

Conclusions

- Study demonstrated a community shift over time in which UP4 native SAV increased in overall species richness and plant abundance, resulting in increased similarity to LP4 assemblages.
- The recovery of SAV in UP4 coincided with a period of relatively low summer discharge, turbidity and phosphorus.
- Indicates the ability of vegetation community to recover when river conditions improve—in this case due to reduced turbidity associated with lower tributary inputs during a period of low discharge.

Tier 3 floodplain elevation data

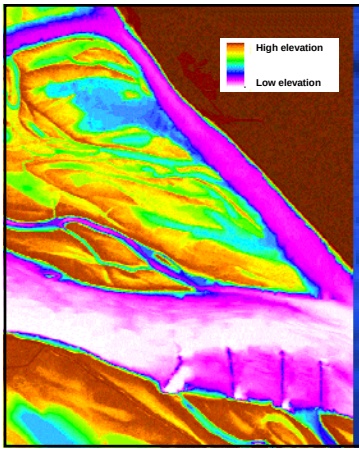
"Topobathy": A seamless elevation dataset generated by merging LiDAR and bathymetry data

Why?

- **LiDAR limited to terrestrial areas**
- **Bathymetry data previously used photo-interpreted shorelines and assigned elevations to interpolate shallow areas. That is replaced by interpolation to shoreline elevation attained using LiDAR.**

Topobathy:

- **Is critical for 2-D hydrodynamic modeling at higher discharge conditions—when aquatic areas expand substantially beyond bathymetry data coverage,**
- **Can also be used for studies on near-shore habitat use by water birds, fish spawning and marshland vegetation,**
- **Improved the bathymetry data by interpolating to LiDAR data,**
- **Is provided in a more reasonable file size (can be served by pool).**



- **Digital Elevation Models as TIFs**
- **Cell size of 2 meters**
- **Elevation in centimeters**
- **Vertical datum of NAVD 1988**
- **Zip file download sizes of 20-80 MB for entire pool**

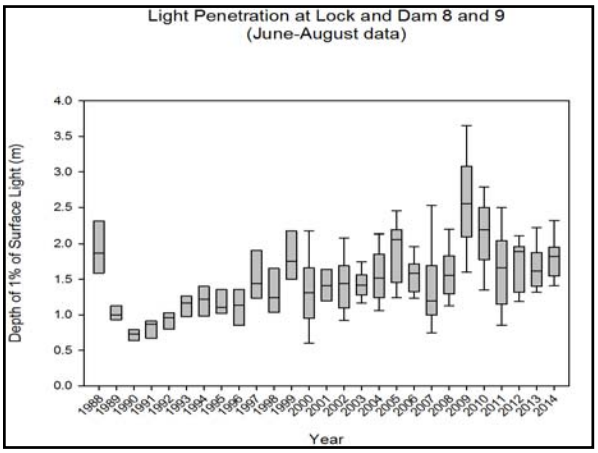
Completed pools:
Pool 3
Pool 4
Pool 5
Pool 7
Pool 8
Pool 9
Pool 13
Pool 21

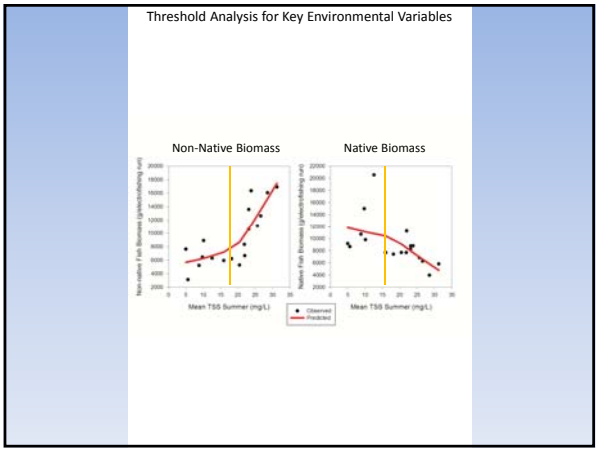
UMRR LTRM Component Meetings Held April 14 and 15 in La Crosse, WI

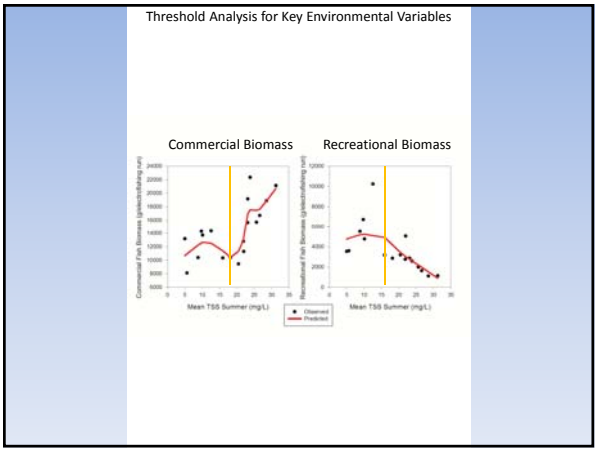
FY15 UMRR Science in Support of Restoration and Management SOWs

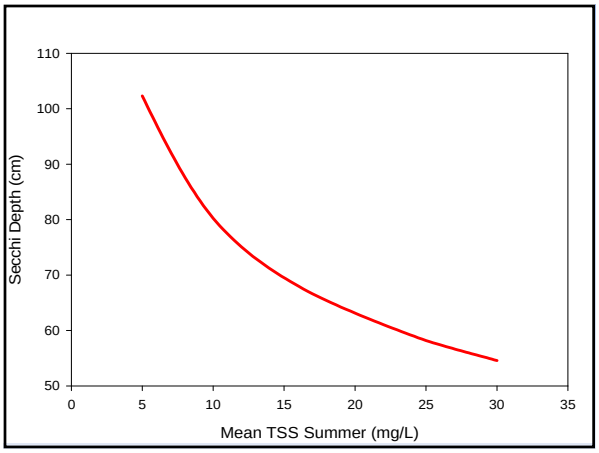
Proposal Title	PI	UMESC funding (gross)	State funding (gross)	USACE funding	TOTAL FUNDING
Seamless Elevation Data (remaining work)	Dieck/Hanson	$420,343			$420,343
Producing NED ready LiDAR products	Nelson/Dieck	$93,063			$93,063
Pool 12 AM Monitoring - pre-construction biological response monitoring (crappie telemetry) (Pool 12 AM)	Bierman		$27,130 $23,571	$10,320	$61,021
Fish Indicators of Ecosystem Health	McCain	$12,913	$45,317	$15,680	$73,910
Plankton community dynamics in Lake Pepin, a natural riverine lake in the Upper Mississippi River	Burdis		$13,143		$13,143
Estimating trends in UMRR fish and vegetation levels using state-space models	Gray	$43,490			$43,490
Generating and serving presumptive habitat maps for 28 UMRS fish species	Hlavacek/Ickes	$ 10,002			$ 10,002
Predictive Aquatic Cover Type Model – Phase II	Yin	$59,722 + $7,814		$54,900	$122,436
Landscape Pattern Research on the Upper Mississippi River System: Synthesis and Significance, FY16-18	De Jager	$589,018			$589,018
Developing and applying indicators of ecosystem resilience to the UMRS	Houser	$483,171			$483,171
TOTAL		**$1,720,320**	**$109,161**	**$80,900**	**$1,910,381**

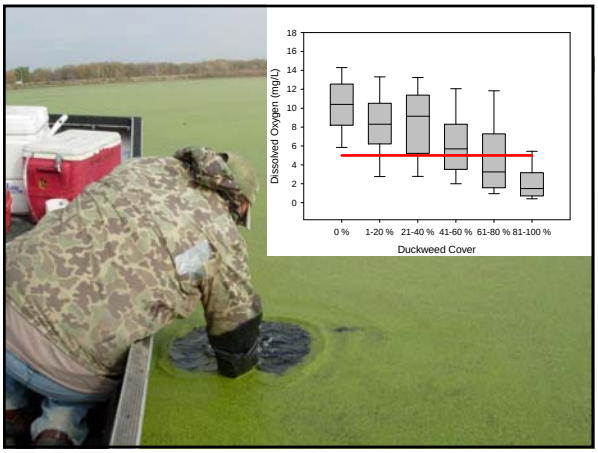

A Team Update
Shawn Giblin
A Team Chair
Wisconsin Department of Natural Resources

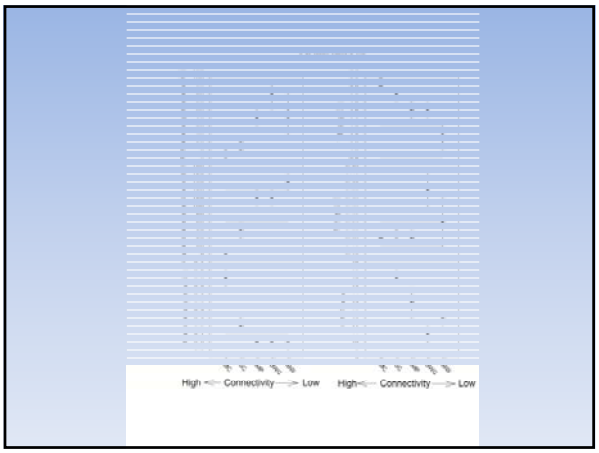

Light Penetration at Lock and Dam 8 and 9
(June-August data)
Depth of 1% of Surface Light (m)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Year

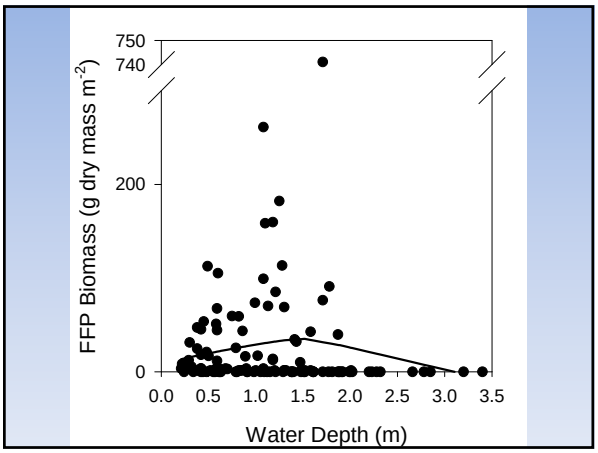

Threshold Analysis for Key Environmental Variables
Non-Native Biomass
Native Biomass


Threshold Analysis for Key Environmental Variables
Commercial Biomass
Recreational Biomass


Secchi Depth (cm)
110
100
90
80
70
60
50
0
5
10
15
20
25
30
35
Mean TSS Summer (mg/L)


Dissolved Oxygen (mg/L)
18
16
14
12
10
8
6
4
2
0
0 %
1-20 %
21-40 %
41-60 %
61-80 %
81-100 %
Duckweed Cover


High
Connectivity
Low
High
Connectivity
Low


750
740
200
0
FFP Biomass (g dry mass m-2)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Water Depth (m)

Upper Mississippi River System
Designated by U.S. Congress as:

"… a nationally significant ecosystem and a nationally significant commercial navigation system. …"

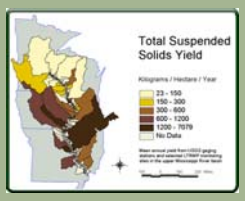
Upper Mississippi River Restoration (UMRR) was created so that the UMRS: "shall be administered and regulated in recognition of its several purposes."

Citation: Water Resources Development Act of 1986, Section 1103(a)(2).

Given the importance of this system…Must understand factors that influence the structure and function of the ecosystem. Three pressing issues relate to nutrient and sediment loading, climate change, and invasive species. All of which could potentially alter the native fishes.

NUTRIENT AND SEDIMENT LOADING

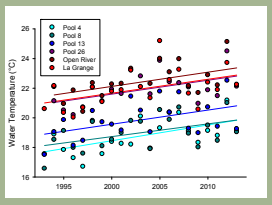
Human activity in the UMR in the last 200 years has altered the delivery of sediment and nutrients to the river. Modifications within the floodplain have also changed the processing, storage, and downstream transport of these materials.



CLIMATE CHANGE

John Chick shared these data.

Impacts of thermal regime may also impact the UMR fish community…



UNDERSTANDING THE IMPACTS OF INVASIVE SPECIES ON NATIVE FISHES IN THE UMR

QUINTON PHELPS, SARA TRIPP, DAN JAMES, DAVID HERZOG, & ROBERT HRABIK

BACKGROUND

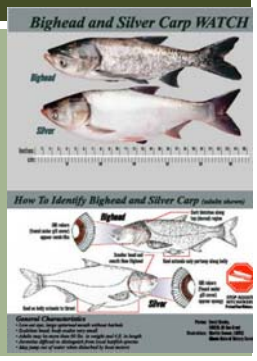
Two spp. of interest bighead carp silver carp (focus on silver carp)

Large-bodied planktivores

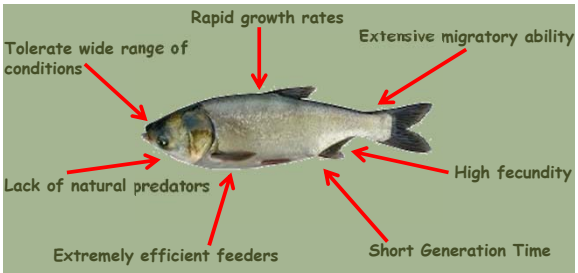
Introduced to control water quality in aquaculture ponds

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

Carp can now be found in several states throughout the country



SILVER CARP PERSIST IN MANY LOCATIONS



Great Invader…not good but true!

WHAT ARE THE POTENTIAL IMPACTS ON AQUATIC SYSTEMS?

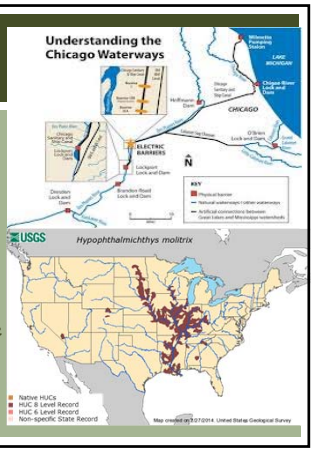
Silver carp may alter habitats and compete with native species leading to a disrupted system

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 Mississippi River system have not received attention despite the apparent relevance



SO….MULTIPLE QUESTIONS IN THE 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 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 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

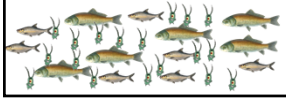
METHODS

To evaluate interspecific interactions in the Mississippi River electrofishing data for silver carp, bigmouth buffalo, and gizzard shad complied 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.

Prior to Invasion



Post Invasion

SVCP*NATIVE FISH ASSOCIATIONS

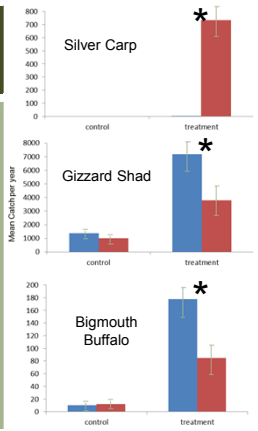
Blue bar represents pre invasion (prior to 2003) while red bar represents post invasion (after 2003)

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

No differences in control pre and post invasion

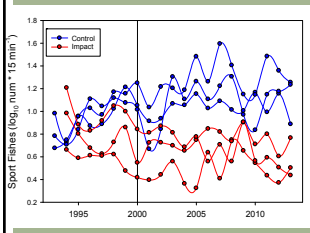
Differences in treatment group pre and post (* significant 0.05)

Which indicates there may be problems



Courtesy Chick et al.,

Mixed Model Analysis

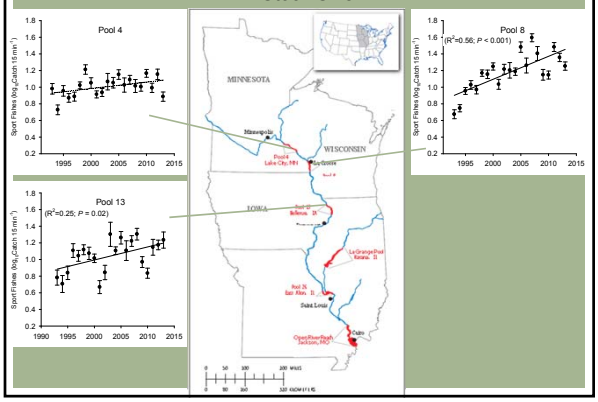


Effect	P value
Intercept	0.026
Year	0.002
Silver Carp	0.030
Year* Silver Carp	0.029
TSS	0.756
Flood Days	0.625
Temp	0.377

Random intercept
Repeated subj. = field station
Variance components

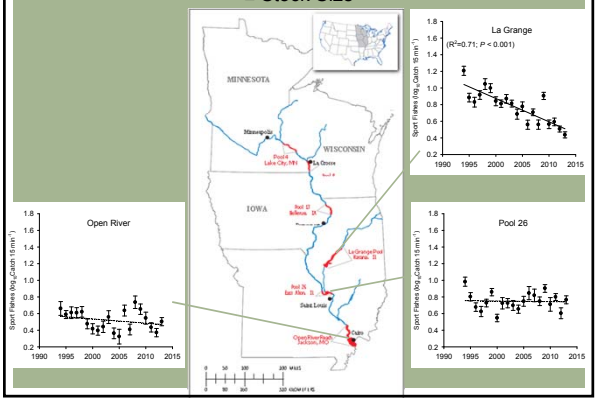
Courtesy Chick et al.,

Recreationally Harvested Fishes ≥ Stock Size



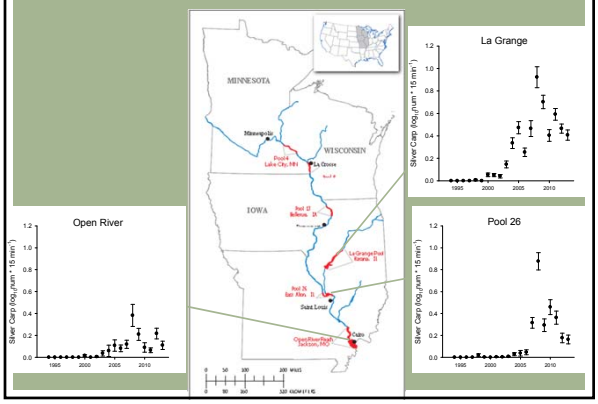
Courtesy Chick et al.,

Recreationally Harvested Fishes ≥ Stock Size



Courtesy Chick et al.,

Silver Carp

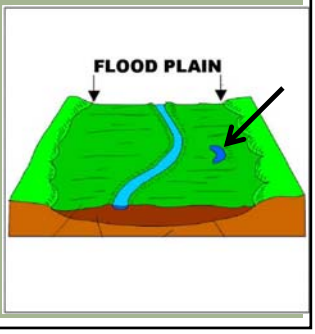


SO…ARE ASIAN CARP NEGATIVELY INFLUENCING NATIVE FISHES IN THE MISSISSIPPI RIVER?

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	DOMINANT SPECIES PRESENT DURING LAST SAMPLING EVENT
Gizzard Shad	Gizzard Shad
White Bass	White Bass
Bluegill	Bluegill
Green Sunfish	Green Sunfish
Largemouth Bass	Largemouth Bass
Smallmouth Buffalo	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	DOMINANT SPECIES PRESENT DURING LAST SAMPLING EVENT
Flathead Catfish	Flathead Catfish
Silver Carp	Silver Carp
Gizzard Shad	Gizzard Shad
Bluegill	Bluegill
Shortnose Gar	Shortnose Gar
Channel Catfish	Channel Catfish
White Crappie	White Crappie
Bigmouth Buffalo	Bigmouth Buffalo
Common Carp	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	DOMINANT SPECIES PRESENT DURING LAST SAMPLING EVENT
Silver Carp	Silver Carp
Bowfin	~~Bowfin~~
Gizzard Shad	~~Gizzard Shad~~
Smallmouth Buffalo	Smallmouth Buffalo
Bluegill	Bluegill
Bigmouth Buffalo	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	DOMINANT SPECIES PRESENT DURING LAST SAMPLING EVENT
Silver Carp	Silver Carp
Sauger	~~Sauger~~
Gizzard Shad	~~Gizzard Shad~~
White Bass	~~White Bass~~
Bluegill	~~Bluegill~~
Green Sunfish	~~Green Sunfish~~

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

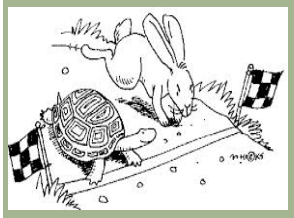
SO…ARE SILVER CARP ALTERING FLOODPLAIN FISH COMMUNITIES?

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 acclimation, 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)

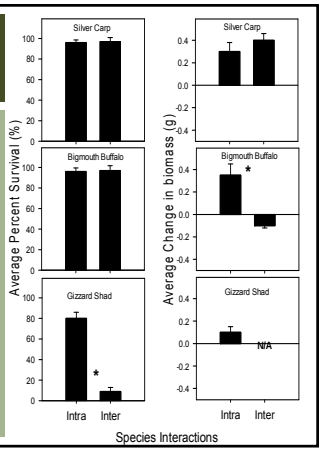
At the end of the 14-d trials, growth and survival for each species were evaluated

EXPERIMENTAL RESULTS

Unable to detect intraspecific competition but interspecific interactions exist…

In the presence of silver carp, bigmouth buffalo had high survival (~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

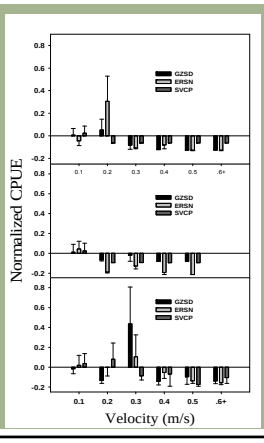


WHAT DOES ALL OF THIS MEAN?

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

What's next?

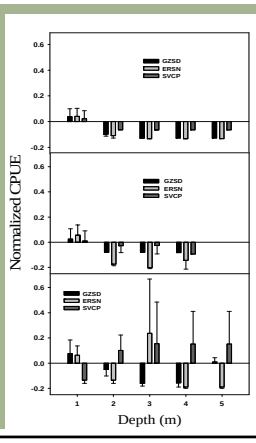


LaGrange
n=486
ANCOVA GZSD*SVCP (F=0.01; P=.9731)
ANCOVA ERSN*SVCP (F=0.15; P=.7026)

Alton
n=261
ANCOVA GZSD*SVCP (F=0.01; P=.9064)
ANCOVA ERSN*SVCP (F=0.03; P=.8707)

Open River
n=300
ANCOVA GZSD*SVCP (F=0.01; P=.9441)
ANCOVA ERSN*SVCP (F=0.06; P=.8101)

No Proportional Difference in Velocity use!!!

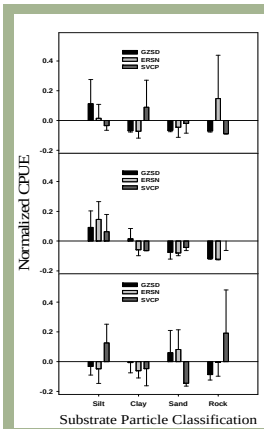


LaGrange
n=486
ANCOVA GZSD*SVCP F=0.03; P=.8651
ANCOVA ERSN*SVCP F=0.04; P=.8418

Alton
n=261
ANCOVA GZSD*SVCP F=0.01; P=.7452
ANCOVA ERSN*SVCP F=0.11; P=.7542

Open River
n=300
ANCOVA GZSD*SVCP F=1.62; P=.2036
ANCOVA ERSN*SVCP F=1.09; P=.2977

No Proportional Difference in Depth use!!!



LaGrange
n=486
ANCOVA GZSD*SVCP (F=0.16; P=.6854)
ANCOVA ERSN*SVCP (F=0.31; P=.5803)

Alton
n=261
ANCOVA GZSD*SVCP (F=0.07; P=.7862)
ANCOVA ERSN*SVCP (F=0.07; P=.7857)

Open River
n=300
ANCOVA GZSD*SVCP (F=0.03; P=.852)
ANCOVA ERSN*SVCP (F=0.10; P=.7518)

No Proportional Difference in Substrate use!!!

ACKNOWLEDGEMENTS

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