Upper Mississippi River Restoration Program
Coordinating Committee
Quarterly Meeting

February 11, 2015

Highlights and Action Items

Program Management

- The Administration has directed District staff to provide more detailed allocation information in UMRR's proposed budgets. The internal allocations for FY 15 and FY 16 outlined below reflect how District staff are now presenting the program's budgets to the Administration. In addition, District staff are reformatting the budget spreadsheets that are provided in the UMRR Coordinating Committee quarterly meeting agenda packets to be more understandable, useful, and transparent.

- **The FY 15 Consolidated Appropriations Act was enacted on December 16, 2014 and includes $33.170 million for UMRR.** At that funding level, the program's 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 President's FY 16 budget request includes $19.787 million for UMRR.** 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, including Everglades and Chesapeake Bay. The final FY 16 appropriation is unknown. Under the President's FY 16 budget scenario, program internal 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 – $300,000
    - Habitat project evaluations – $804,000

- ▪ Habitat Restoration – $12,479,000

  o Regional project sequencing – $100,000

  o MVP – $3,425,000

  o MVR – $4,745,000

  o MVS – $4,209,000

  [Note: The District HREP funds are not reflective of the historical split, rather are reflective of on the project priorities as identified in the budget process.]

- UMRR Coordinating Committee members applauded District staff who were involved in discussions with the Administration about the program's FY 16 budget. Committee members expressed concern with the long term resource monitoring allocation, noting that it is less than funding levels needed to maintain the continuity and integrity of the data set. **USACE will host a February 19 conference call with field station leaders to overview the FY 16 science allocations per the President's FY 16 budget and discuss any questions. Hubbell said he plans to hold more frequent calls with field station leaders in the coming months regarding the field stations budgets. Hubbell said he also anticipates convening UMRR's** *ad hoc* **funding group to consider programmatic implications from the reduced funding.**

- USACE Headquarters issued guidance for developing the FY 17 budget. District staff will initiate FY 17 planning for UMRR shortly.

- **Following its November 2014 quarterly meeting, the UMRR Coordinating Committee established a team to develop an operational plan to focus program implementation on achieving the FY 15-25 UMRR Strategic Plan's vision, goals, and objectives.** At its first meeting, held on January 20-22, the team developed an operation plan framework and identified key implementing actions for the Strategic Plan's objectives.

- WRRDA 2014 directs USACE to contract with the National Academy of Public Administration to review and make recommendations for improving the PPA template and preparation, negotiation, and approval process. **Meden anticipates that non-federal entities will have an opportunity to participate in that evaluation, at a minimum by providing comments. He will share the relevant information with UMRR partners when it is released. In addition, Meden will work with UMRBA to communicate UMRR's PPA-related concerns with Headquarters.**

- Nicole Lynch presented Lean Six Sigma concepts and provided initial direction on selecting programmatic areas to examine. **Hubbell will send an email to UMRR Coordinating Committee members shortly to request their top five priorities to address through Lean Six Sigma. The Committee will select one or two areas at its May quarterly meeting and establish a group to address them during the summer.**

- Michael Dougherty presented on the purposes, design, construction, and applications of the UMRR Database, as well as ongoing work to input historical program information and digitize various features. This includes inputting electronic copies of all UMRR quarterly meeting packets since its inception. Dougherty provided an overview of future plans to enhance the Database's capabilities and accessibility to non-USACE program partners.

- Hubbell anticipates that USACE will soon finalize a contract with UMRBA to write and publish the 2016 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 official review is scheduled for spring 2016 with a final report incorporating graphics submitted to Headquarters in November 2016. **Kirsten Mickelsen will contact UMRR Coordinating Committee members shortly to identify implementation issues to address in the report.**

Habitat Rehabilitation and Enhancement Projects

- Design work on Rip Rap Landing is pending receipt of a sponsor support letter from Illinois DNR. MVS's planning priorities remain Piasa and Eagles Nest Islands and Harlow and Wilkinson Islands. The District is developing potential options for new project starts. Clarence Cannon is the District's primary design effort.

- MVP awarded a $12.3 million construction contract for Harpers Slough, with the $6 million base contract awarded in the last weeks of FY 14 and two options totaling $5.9 million awarded last October. This contracting approach of providing full funding at the outset resulted in substantial cost savings.

- MVR is accelerating its planning efforts on Beaver Island and anticipates completing its feasibility report in FY 15 or early FY 16. The District is also finalizing the feasibility report for Emiquon Eastsprojects are currently under construction.

- **USACE anticipates issuing a contract in March to 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. The planned schedule is for the team to begin this effort in spring or summer 2015 and completing the project at the end of FY 17.**

- **A team to identify the next generation of habitat projects will be convened in fall 2015.** The team will develop an outline, assemble key data sources, identify perspective members of the system ecological team, and utilize information from an updated habitat needs assessment (HNA). Hubbell anticipates that the process will take two years.

- Kara Mitvalsky presented on Beaver Island's plans to restore mussel habitat with features to protect Albany Island and enhancing rock substrate. In addition, Mitvalsky presented on Huron Island Complex's project construction and the contractor's innovative approach to excavating the site.

Long Term Resource Monitoring Element

- Jeff Houser showcased the long term resource monitoring fish data set in Pool 13 and the capabilities that the 22-year trend data now allows for research and analysis, including the effectiveness of management approaches. As an example, analysis of sex-specific age structure, growth, and mortality of black and white crappie in Pool 13 show that a mandatory catch-and-release regulation of riverine largemouth bass populations had only a short-term positive effect.

- The Illinois River Biological Station on the La Grange Reach is evaluating population dynamics of Asian carp to better assess their ecological impact. Thus far, research is showing that three to five year old fish dominate the population. This could indicate that there is a recent lack of successful recruitment to adulthood, unless there is a gear bias towards that age group. Continued monitoring will help clarify the results. The Illinois Station is also evaluating population dynamics of key indicator species to inform habitat project selection, among other information and management needs.

- NGRREC is working cooperatively with UMRR to evaluate new monitoring platforms capable of collecting real-time data on a wide variety of water quality measures, including the YSI PISCES Platforms that are used in the Great Rivers Ecological Observatory Networks.

- USGS is developing methods to assess mussel survival rates using passively integrated transponder tags to monitor population vital rates (e.g., mortality, recruitment, growth). These tags could offer a better long term monitoring method for mussels, and provide for a mussel indicator of ecological health and environmental changes.

- Wisconsin DNR has hired two new UMRR long term resource monitoring staff. John Kalas was hired as the water quality specialist and Dr. Deane Drake as the vegetation specialist.

<u>**Emerging Trends and Issues**</u>

- **The UMRR Coordinating Committee endorsed the UMRR Invasive Species Policy as provided in the agenda packet, with language modifications regarding the reporting of new or rare captures or sightings of invasive species. Karen Hagerty will send a revised version to the UMRR Coordinating Committee for approval.**

- The UMRR Coordinating Committee identified no new emerging trends or issues to explore in 2015.

<u>**Other Business**</u>

- **Upcoming quarterly meetings are as follows:**
  - **May 2015 — St. Louis**
    - UMRBA meeting — May 5
    - **UMRR Coordinating Committee — May 6**
  - **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**

UMRR EMP CC Quarterly Meeting
February 11, 2015

Marvin E. Hubbell - MVR
UMRR Regional Program Manager

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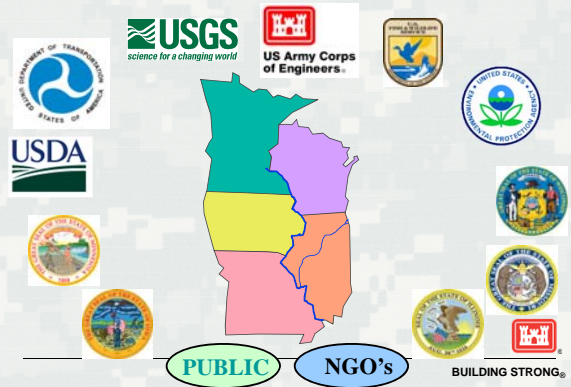Mississippi Valley – St. Louis District (MVS)
Mississippi Valley – St. Paul District (MVP)

US Army Corps of Engineers
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UMRR Program Partners

PUBLIC   NGO's

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UMRRP FY15 Work Plan

TOTAL FY15 Program	**$33,170,000**
Regional Administrative Amount	**$ 1,000,000**
Regional Management (Regional EMP & LTRM)	$ 524,000
Program Database	$ 95,000
Regional Project Sequencing	$ 70,000
UMRR-EMP Strategic Plan	$ 25,000
UMRBA	$ 76,000
HREP/LTRM Integration	$ 90,000
Public Outreach	$ 35,000
2016 Report to Congress	$ 85,000
LTRM (Base Monitoring)	**$ 5,500,000**
HREP	**$26,670,000**
UMRR Regional Science In Support Rehabilitation/Mgmt.	$ 1,800,000
St. Louis District	$ 7,491,000
Rock Island District	$ 9,888,000
St. Paul District	$ 7,491,000

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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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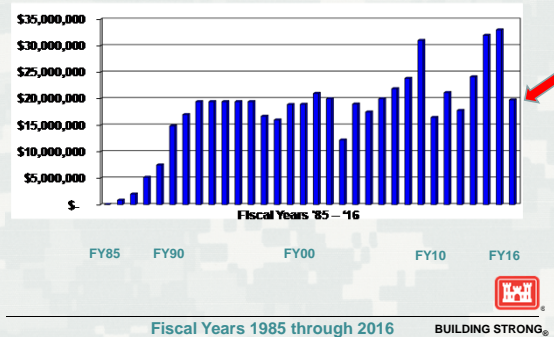## FY 16 Budget Request

- 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 guidance

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UMRR Program Appropriation/Budget History

Fiscal Years '85 – '16

FY85   FY90   FY00   FY10   FY16

Fiscal Years 1985 through 2016   **BUILDING STRONG®**

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.)	$ 300,000
Habitat Evaluation	$ 804,000
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

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

- 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.
- Anticipated completion Sept. 2015

Operational Plan

- Committee Members
  - Kat McCain, Tom Novak, Tim Yeager, Jeff Houser, Andy Casper, Kevin Stauffer, Gretchen Benjamin, Jeff Janvrin, Kirsten Mickelson, Dru Buntin, and Marv Hubbell

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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~~

Update on topics from Senior Leaders Meeting

- Topics discussed with Senior Leaders
  - Project Partner Agreements (PPA)
  - LEEN Six Sigma

Project Partner Agreements (PPA)

LEEN Six Sigma

- Schedule:
  - Feb. - Overview of LEEN Six Sigma
  - March to April – Identification of possible management issues to be addressed
  - May – Identify one or more key issues
  - July to September – Address key issues
- Systematic process for continuous improvement.

Program Database Update

2016 Report to Congress

- Schedule (Starting in 2015)
  - ►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

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2016 Report to Congress

- Schedule (Starting in 2016)
  - ►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

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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

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Public Outreach

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Staffing Communication Team

- Kevin Bluhm
- Volunteers

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Slide 1

UMRRP Habitat Rehabilitation and Enhancement Projects

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

2013 Program Status
- Planning/Design/Construction Stages
- Completed Projects

Miles 0 20 40 80 120 160

25
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Slide 2
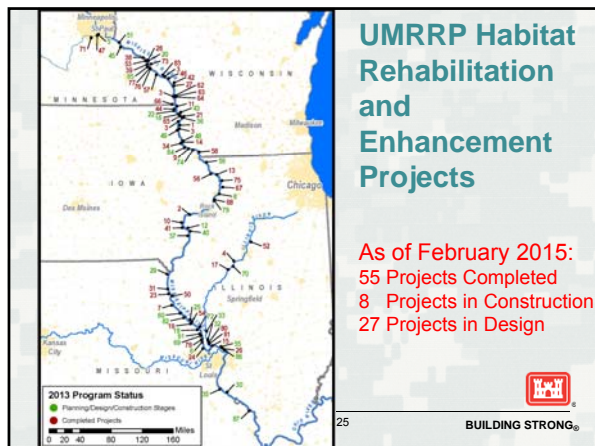
ST. LOUIS DISTRICT (MVS)
FY15 HREP Work Plan (Feb. 2015)

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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Slide 3

New MVS Commander HREP Site Visit

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Slide 4

ST. PAUL DISTRICT (MVP)
FY15 HREP Work Plan (11 Feb 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
Harpers Slough, Pool 9, IA ($12.3M)
➤ Stage 1 - Newt Marine.

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

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Slide 5

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

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

➤ Snyder Slough Backwater, Pool 11, WI **($20K)**
➤ Beaver Island, Pool 14, IA **($540K)**

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

➤ Huron Island Stage II, Pool 18, IA **($220K)**

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

➤ 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)**

EVALUATION
➤ FWS **(L $150K)**
➤ Baseline Monitoring
➤ Adaptive Mgmt. Pool 12

➤ Post Project Monitoring
➤ Performance Evaluations **($250K)**
➤ Bertom and McCartney
➤ Pool 11 Overwintering
➤ Chautauqua NWF

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Slide 6

Linking Indicators of Health and Resilience and Next Generation of Projects

▪ Strategic Mission and Vision Statement

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Indicators of Health and Resilience

- March 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 – 2nd – 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

Beaver Island Habitat Project

- Kara Mitvalsky
- Monique Savage

UMRR Program
Invasive Species Policy

- Minor editorial changes
- No major changes otherwise

UMRR Program
Invasive Species Policy

Purpose of Policy: This paper identifies and addresses the UMRR Program's role regarding invasive species within its authorization and the interagency Partnership while considering the national and Corps of Engineers' (Corps) invasive species policies (see references below). All UMRR activities will comply with national and Corps regulations and guidance, and will consider state regulations, as appropriate.

Slide 1

Numbered Items

- Order changed from:
  - reporting, research, projects, communicating

- Order changed to:
  - communicating, reporting, research, projects

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Slide 2

Reporting Text

- Changed from:
  In addition to the required <u>reporting</u> of new or rare captures or sightings of invasive species by each UMRR partner agency, these new captures…

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Slide 3

Reporting Text

- Changed to:
  <u>Reporting</u> of new or rare captures or sightings of invasive species by each UMRR partner agency is already required per each agency's rules or regulations. In addition, new captures…

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Slide 4

Mud Lake Pool 11 July 2006   BUILDING STRONG®

Slide 5

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**

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Slide 6

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**

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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

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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**

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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

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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
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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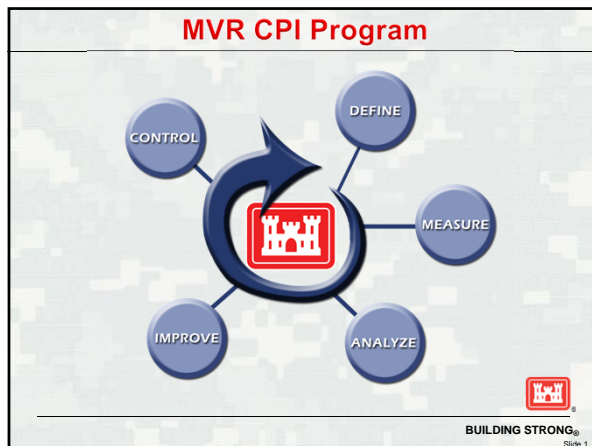
MVR CPI Program

CPI Program

Lean Six Sigma (LSS) Brief Introduction

- **"Lean"**
  - Focus is eliminating non-customer value added waste in a process or service (efficiency and speed)
  - Result is reducing service lead times, improving on-time delivery performance, and reducing cost

- **"Six-Sigma"**
  - Term originally comes from statistics
  - Statistics help us measure and understand both individual data points, averages, and variation in a process or service
  - Primary focus on reducing defects to the customer (effectiveness, quality) and achieving improvements in service quality and cost

- **"Lean Six-Sigma"**
  - Combines the speed and power of both Lean and Six Sigma
  - Voice of the customer defines quality
  - Eliminating variation to the customer requirements

CPI Program

Project Selection

- **Identify Value Levers**
  - Organizational strategy is the starting point for opportunity identification
  - Better understand your customers requirements to identify the gap between requirements and performance

- **Identify Project Opportunities**
  - Translate those opportunities into project ideas

- **Screen Project Opportunities**
  - Rank the benefit and effort of each opportunity
  - Benefit being, strategic fit and cost savings
  - Effort being, resources required, project duration, project risk

- **Define Project**
  - High priority project ideas are identified and project sponsor is assigned

- **Project Prioritization**
  - List potential project ideas by rank of importance
  - Identify projects that could be Rapid Improvement Events (RIE)

Slide 1

Upper Mississippi River Restoration Database (UMRR-DB)

Michael Dougherty
Geographer
February 2015

US Army Corps of Engineers
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Slide 2

Presentation Overview

1. Purpose and objectives
2. Problem statement
3. Solution
4. Accomplishments
5. In progress
6. Feature roadmap

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Slide 3

UMRR-DB Purpose

The purpose of the UMRR-DB is to combine key UMRR information into a single database application to produce *priority program and project level reports and analyses*.

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Slide 4

UMRR-DB Goals

1. **Standardize Reporting** – Standardize program and project level reporting to increase awareness of UMRR accomplishment of program strategic goals and objectives.

2. **Support Analysis** – Support HREP design, analysis, and performance monitoring to increase effectiveness of applied ecosystem restoration science.

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Slide 5

Problem Statement

Databases of HREP projects have been maintained since 1997, however they have all suffered from several of the same problems:

- Built on single user platform (i.e., MS Access) and therefore impossible for efficient multiuser editing
- Spatial data (e.g., boundaries, features) managed in a different format than the project summary data
- Difficult to coordinate/standardize updates across three USACE districts (partners, impossible)
- Never matured to the point of being useful for analyzing program/project effectiveness

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Slide 6

Solution

Built a new system using:

- Web-database application technology allowing multiple simultaneous editors
- Enterprise level, industry standard technologies (Oracle)
- Project summary data integrated with geometry (Oracle Spatial, ESRI ArcSDE), readily available to analysts
- Rapid database application development environment to help reduce maintenance cost (Oracle APEX)

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Oracle Application Express (APEX)

- Oracle Application Express (Oracle APEX) is a declarative, rapid web application development tool for the Oracle database.
- It is a fully supported, no cost option available with all editions of the Oracle database.
- Using only a web browser, you can develop and deploy professional applications that are both fast and secure.
- Fully embraced by USACE. Won't change in the foreseeable future.

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Advantages

- Links all program data together
- Not a replacement for enterprise data systems; fills gaps
- Records history of program on key issues
- Standardized, tailored reporting
- Web-based allows access to all program partners
- Access is provided based on roles
- Standardized workflow maintains data quality/consistency

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Accomplishments

1. Developed Oracle APEX web-based application supporting multiuser editing on the USACE network
2. Migrated data from previous MS Access 2003 and 2007 databases
3. Compiled HREP data for all three UMRR USACE Districts (i.e., St. Louis, Rock Island, and St. Paul Districts)
4. Added HREP total project cost estimates
5. Combined HREP status, spatial locations, financial costs, organizations, HREP documents, etc. into a single framework to support comprehensive report generation

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Accomplishments (continued)

6. Developed several standardized reports (e.g., congressional fact sheets, state fact sheets, PB3 report)
7. Updated user authentication model to support definition of fine-grained user roles
8. Performed several QA checks of specific data elements to ensure accuracy and consistency
9. Established of a standing product development team (PDT) to guide development and maintenance of UMRR-DB

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In Progress

1. Developing a workflow that assigns clear roles and responsibilities for data update and QA
2. Digitizing all key HREP documents (i.e., fact sheets, feasibility reports, plans & specs, as-builts, O&M manuals, performance evaluation reports (PER)) and loading into the database
3. Digitizing all UMRR Coordinating Committee (UMRR-CC) quarterly meeting reports (UMRBA) and loading into the database
4. Adding all historic UMRR financial cost data and developing a workflow for regular updates

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In Progress (continued)

5. Updating points of contact (POC) for all specialty areas for all HREPs
6. Adding HREP goals, project objectives, and performance criteria
7. Developing a standard data model for storing HREP restoration features with 3D geometry

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Feature Roadmap

1. Migrate HREP restoration features to new data model, upgrade geometry to 3D, write standard operating procedure (SOP)
2. Add images to HREPs
3. Add contracts to HREPs
4. Automate production of the J-Sheet report
5. Automate production of the UMRR-CC quarterly meeting cost reports
6. QA review of HREP boundaries with project sponsor POCs

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Feature Roadmap (continued)

7. QA review of HREP restoration features with relevant POCs
8. Develop reports to support the next Report to Congress (e.g., HREP status, HREP restoration features, HREP habitat types)
9. Add HREP PER tracking and scheduling
10. Migrate the UMRR-DB to USACE public-facing servers to enable UMRR partnership use
11. Automate HREP web fact sheet report

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Questions

Michael Siadak, Geographer, Oracle APEX Developer
Michael.W.Siadak@usace.army.mil
309-794-5343

Michael Dougherty, Geographer
Michael.P.Dougherty@usace.army.mil
309-794-5491

Tim Eagan, Project Manager
Timothy.P.Eagan@usace.army.mil
314-331-8368

Kayleigh Easter, Intern
Kayleigh.A.Easter@usace.army.mil
309-794-5217

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BEAVER ISLAND
Mussel Analysis

Clinton County, IA
Mississippi River, Pool 14
February 2015

US Army Corps of Engineers
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Beaver Island HREP · Overview

Project Information

- Project is an UMRR EMP Habitat Rehabilitation and Enhancement Project (HREP).

- Authorization: Original authorizing legislation is the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), Section 1103.

- Sponsor: US FWS

- Cost Share: This project is a 100% Federally funded.

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Problems

- Loss of Diverse Aquatic Habitat
  - ►Riverine
    - Fish
    - Mussels
  - ►Backwater
    - Overwintering
- Loss of Acreage and Diversity of Native Floodplain Forest
- Loss of Wetland Habitat
- Island Erosion

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Mussel Habitat

- Literature Review
- Mussel surveys
- General Criteria
  - ►Substrate - potential enhancement
  - ►Velocity - adequate
  - ►Depth - adequate
- Multi-agency PDT
- Identified areas to target for mussel conservation and enhancement

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Bertom McCartney Mussel Survey

- 4.8 live species per m^2
- 6-7 feet deep
- Velocity greater than 3 feet per second
- River washed gravel/cobble with crushed quarry rock

Preliminary Analysis of Case Studies

	Bertom McCartney HREP (Oct 2014)							Capoli Slough (2009) (Pre-Project Survey)		Cordova (Oct 2014)	
								Hot Zone Areas	Capoli Slough Proper	Cordova EHA	Buffalo EHA
Section	1	2 & 2a	3	4	5	6	7	9	9	14	16
Pool Number	11	11	11	11	11	11	11	9	9	14	16
River Mile	602	602	602	602	602	602	602	658.3-656.8	658.3-656.8	505	470-471
Substrate Diameter/Type	8-36" angular rip rap	Silt/Sand/ 3/8 - 2" crushed angular fragments	4-12" angular rip rap	4-6" angular rip rap	2-4" rounded river stone	2-4" 50% rounded river stone and 50% crushed river angular gravel	6-16" angular rip rap	Sand, silt, and clay. Some sections had some boulder and cobble. No gravel	Silt, clay, and sand with vegetation	Sand, Silt, and 5% gravel	Mix of cobble, gravel, sand, silt, and clay
Water Depth (ft)	8	2-3	6	6-7	6-7	6-7	6-7	3.3-5.9	4.6 (0.66-12.5 range)	3.3 (0.5min-5.5 max)	3.7 (0.6min-5.8max)
Current Velocity (ft/s)	>3 ft/s	1-2 ft/s	>3 ft/s	>3 ft/s	>3 ft/s	>3 ft/s	1-2 ft/s	-	-	-	-
Mussel Density	0 /m²	0.8 /m²	0 /m²	0 /m²	4.8 /m²	4.0 /m²	1.6 /m²	3.4/m²	2.5/m²	10.6/m²	17.12/m²

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Albany Slough

- Mussels present in area
- Protected from navigation channel
- Does not conflict with overwintering (low flow) designs
- Analysis shows erosion of Albany Island

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Beaver Island Mussel Survey August 2014

Attendees
- USACE
- IA DNR
- USFWS
- USGS
- Exelon
- Retired Illinois DNR

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Survey Site Locations

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Mussels
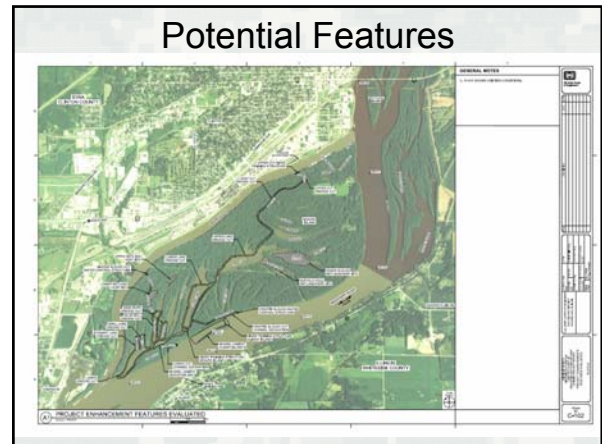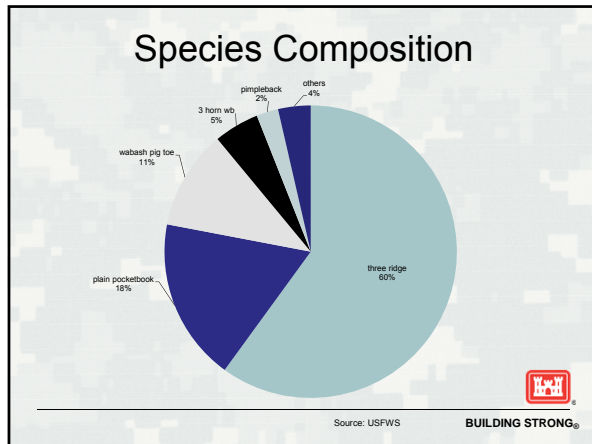

Pimpleback

Yellow Sand Shell

Hickory Nut and Higgins Eye

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Results

SPECIES	NUMBER OF INDIVIDUALS COLLECTED AT EACH SAMPLE SITE												Total individuals	%total
	A	B	C	D*	E	F*	G	H*	I*	J	K*	L*		
Three ridge (A.p)	17	79	6	109		76	1				17	223	528	.60
Plain pocketbook (L.c.)	7	5		13	1	8					13	110	157	.18
3 horn wartyback (O.r.)	9	1	7	12		2				1	3	7	42	.05
White heelsplitter (L.c.)		1									1	1	3	.003
Pink papershell (P.o.)				1								6	7	.008
Giant floater (P.g.)		2		2		1						2	7	.008
Fragile papershell (L.f.)		1		3		1						5	10	.01
Wabash pig toe (F.f)		2		14		11						68	95	.11
Lilliput (T.p.)				1									1	.001
Pink heelsplitter (P.a.)				1								3	4	.005
Pimpleback (Q.p.)	1											20	21	.024
Higgins eye (L.h.)												1	1	.001
Hickory nut (O.o.)		2										2	4	.005
Rock pocketbook A.c.)		1											1	.001
Fawn's foot (T.d.)												2	2	.002
Wartyback (Q.n.)												1	1	.001
Yellow sandshell (L.t.a.)												2	2	.002
Total individuals collected at sites	34	94	13	156	1	99	1	0	0	1	34	453	Total mussels =886	
Catch per minute of effort														
Total No. species=17	4	9	2	9	1	6	1	0	0	1	4	15	Source: USFWS	

* denotes sample collected by pollywogging

Species Composition

others 4%
pimpleback 2%
3 horn wb 5%
wabash pig toe 11%
plain pocketbook 18%
three ridge 60%

Source: USFWS

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Potential Features

PROTECT: Albany Island

- Island is degrading/eroding over time
- Protecting the island could preserve the habitat in Albany

Beaver Island HREP - Albany Island Change

PROTECT: Albany Island

- Riprap head end
- Extend riprap up to 1/3 of the way down to provide substrate for mussels
- Chevron
- Linear toe protection

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ENHANCE: Rock Substrate

- Intermix riprap with Riverwashed Rock
  - ► East bank
  - ► West Bank
- Considered placing substrate in Albany Slough

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Next steps

- Preliminary design
- Incremental Cost Analysis
- Alternative Selection
- Public Review
- Finalize Feasibility Report 2015
- Potential 2017 Construction

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The Future of these Mussels are in Our Hands

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Huron Island Complex
Habitat Rehabilitation and Enhancement Project

Des Moines County, IA

Mississippi River, Pool 18

River Miles 421.4 to 425.4

Agenda

- Project Information
- Project Area
- Existing and Future W/O Conditions
- Problems & Objectives
- Plan Selection
- Stage I Construction
  - ► Clearing
 - ► Dredging
- Future Actions

Project Information

- Project is an UMRR EMP Habitat Rehabilitation and Enhancement Project (HREP).

- Authorization: Original authorizing legislation is the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), Section 1103.

- Sponsor: US FWS, cooperative agreement grants IA DNR responsibility for the operation, maintenance, and repair of the lands.

- Cost Share: This project is a 100% Federally funded.

Project Area

- Right descending bank of the Upper Mississippi River
- Northern portion of Des Moines County, IA
- Pool 18 (RM 421.2 and 425.4)
- Approximately 20 miles upstream of Burlington, Iowa
- Iowa River enters 12 miles upstream of the Project area
- 2,600 acre complex
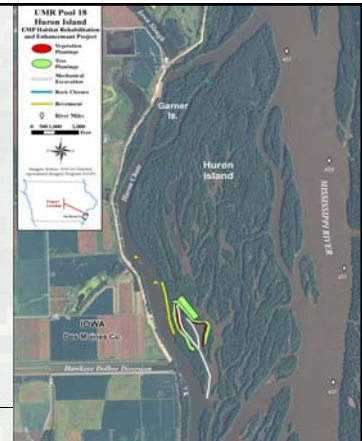
Existing & Future W/O Conditions

- Hydrology, topography, and biotic communities historically present in the Project area have been impacted over the past century
  - ► Reduced native plant and animal populations
  - ► Degraded quality of remaining natural resources and plant communities
  - ► Impaired ecosystem structure and function
- Future Without Conditions
  - ► Aquatic habitat potentially reduced by 70% in the next 50 years
  - ► Large portion of existing forest will be replaced by shrub-scrub habitats or reed canary grass
  - ► Side channel islands will continue to erode and cease to exist as spawning habitat

---

Problems

- Backwater Aquatic Habitat -Aquatic Vegetation
- Floodplain Habitat
- Backwater Aquatic Habitat
- Side Channel Aquatic Habitat

Objectives

- **Objective 1-** Increase the areal coverage as measured in acres of emergent and submersed aquatic vegetation in backwater areas during the growing season.
- **Objective 2 -** Increase diversification of year round floodplain forest and scrub-shrub habitat on Huron Island, as measured in acres.
- **Objective 3 -** Increase the structure and function of year-round aquatic habitat diversity, as measured by acres and native fish use of spawning, rearing, and overwintering habitat in the project area.
- **Objective 4 -** Maintain side channel riverine hydrodynamic, sediment transport and geomorphic processes in Huron Chute.

## Recommended Plan

1. Goose Lake Pool 1 Bathymetric Diversity to 537
2. Goose Lake Pool 1 Bathymetric Diversity to 537
3. Goose Lake Pool 2 Forest Diversity to 537
4. Goose Lake Pool 2 Forest Diversity to 537
5. Garner Chute Closure Structure
6. Forest Diversity In Non-Diverse Forest Location Using Existing Soil to Elevation 537
7. Island Protection using riprap

- First project costs is $12.8M
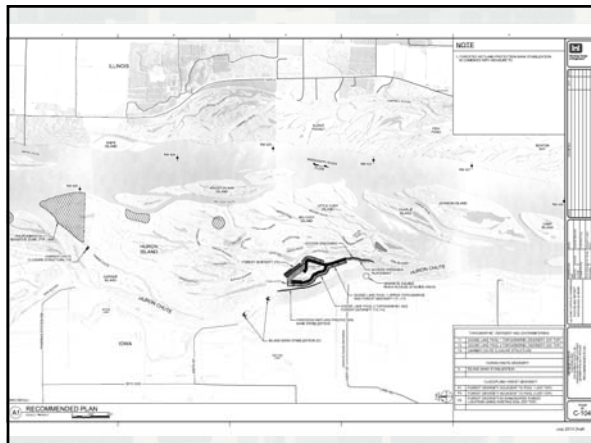
Stage I

- Trade West Construction, Inc.
  - ▶ Mesquite, NV
  - ▶ SB
- Awarded 7/24/2014
- $2,661,910.50

Stage I

- Clearing Placement Sites
- Excavation of Goose Lake
  - ▶ (Pool 1, Pool 2, Access Dredging)
- Placing Material Adjacent to Pools
- Garner Chute Closure Structure
- Small Island Protection

To Clear or Not to Clear

- Leave trees on site in place
- Clear trees but leave on site
- Clear some trees but not all trees
- Clear trees and remove from site

Case Study: Odessa (Trees not cleared)

Case Study: Pool 12 Sunfish Lake (Trees cleared, not removed, some saved)

Fox Island: Using Cleared Trees for Habitat

- Placed cleared trees in a backwater area
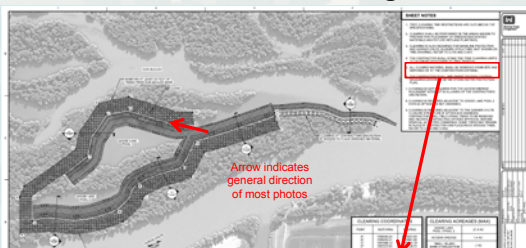- "Blowdown" design (similar to that of a wind storm)
- Provide habitat

Huron Island

- Desire to maximize placement area for plantings planned for future stages (forest, wetland and aquatic vegetation)
- Desire to minimize clearing area (avoiding bat habitat)

Huron Island: Clearing Plate

Arrow indicates general direction of most photos

5. ALL CLEARED MATERIAL SHALL BE REMOVED FROM SITE AND DISPOSED OF AT THE CONTRACTORS EXPENSE.

Huron Island: 150 foot tree clearing limit

Looking Upstream Before Clearing started
(Near junction of Goose Lake Pool 1 and 2)

Tree Clearing Equipment

Starting to Clear Goose Lake Pool 1 (10/6)

Typical clearing 150 feet (10/13)

Continuing to Clear (10/20)

150 feet cleared, starting to excavate (10/27)
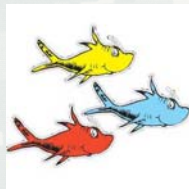

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Berm generally constructed (11/25)

Location for future plantings (wetland and floodplain forest)

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Aquatic Habitat

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Excavation/Dredging Methods

- Hydraulic
- Mechanical
  - ► Barge Mounted Crane
  - ► Floating or Low Pressure Excavator
  - ► Excavator
  - ► Barge Mounted Excavator
  - ► Drain and Excavate

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Large Hydraulic Dredge

Odessa: Discharge Pipe   **Hunt Lima: Dredge Plant**

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Small Hydraulic Dredge

Lake Odessa   **Long Island Division**

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Small Hydraulic Dredge

- Ventura Marsh

Floating or Low Pressure Excavators

Odessa

Chautauqua

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Excavators (On the Ground)

Fox Island

Rice Lake

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Excavators (On very soft ground)

Rice Lake (Overflow Spillway)

Rice Lake (Discharge Channel)

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Barge Mounted Excavator

Odessa Stage IIB

Pool 12 Stage I (Sunfish Lake)

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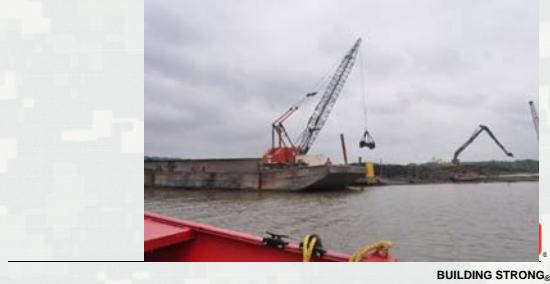
Dry Dredge to Tube (Peoria Islands)

Barge Mounted Crane with Bucket

Peoria Lake (HREP)
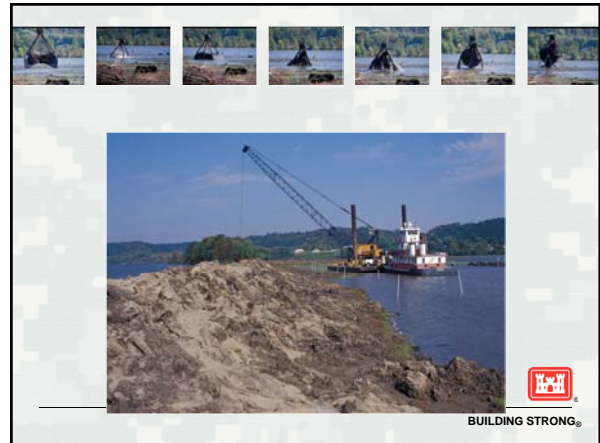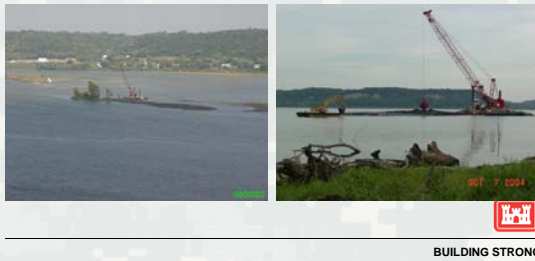
Barge Mounted Crane with Bucket

- Peoria Islands (519)

Barge Mounted Crane with Bucket

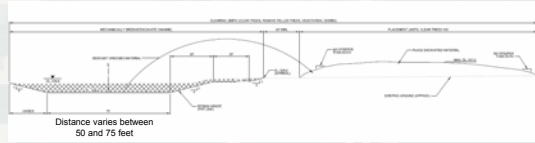Pool 11   Pool 11

Barge Mounted Crane with Bucket

Pool 12 Stage I (Sunfish Lake)

Huron Island Excavation Plan

PLACED DREDGED MATERIAL
DREDGE/EXCAVATE GOOSE LAKE POOL 1
SEE SHEET C-108

DREDGE/EXCAVATE GOOSE LAKE
SEE SHEET C-106

STAGING AREA

CLEAR SITE AS NEEDED
PLACE DREDGED MATERIAL
SEE SHEET C-104

DREDGE/EXCAVATE GOOSE LAKE POOL 2 - OPTION A
SEE SHEET C-109

PLACE DREDGED MATERIAL - OPTION A

Typical Dredging/Excavation Section

Distance varies between 50 and 75 feet

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Equipment Used for Estimate

Distance to placement site (Max)
(75-15)+24+20+8+20+150 feet = 282 ft

Distance to placement site (Min)
(75-15)+24+20+8+20 feet = 132 ft

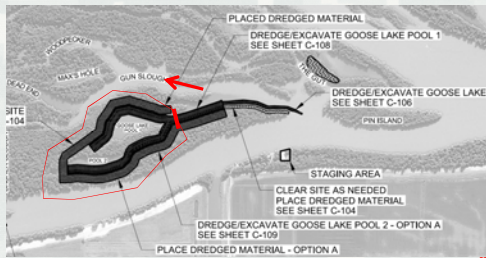30 foot work barge, crane sits in middle of channel (75-15)

75 foot bottom width
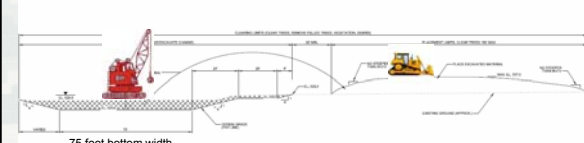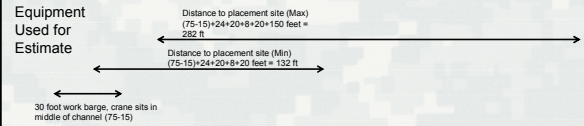
Manitowac 999 crane
- 250 ton capacity
- 290 feet heavy lift boom
- 330 feet fixed jib on heavy lift boom
- 7 CY bucket

BUILDING STRONG®

Contractors Plan (Upper Dredging)

Construct berm, pump water, excavate Pool 1 and Upper Pool 2

PLACED DREDGED MATERIAL
DREDGE/EXCAVATE GOOSE LAKE POOL 1 SEE SHEET C-108
DREDGE/EXCAVATE GOOSE LAKE SEE SHEET C-106
PIN ISLAND
STAGING AREA
CLEAR SITE AS NEEDED PLACE DREDGED MATERIAL SEE SHEET C-104
DREDGE/EXCAVATE GOOSE LAKE POOL 2 - OPTION A SEE SHEET C-109
PLACE DREDGED MATERIAL - OPTION A

BUILDING STRONG®

Looking Upstream (Near junction of Goose Lake Pool 1 and 2): Constructing Berm

09.30.2014 11:07

BUILDING STRONG®

Connecting berm to "high" ground

09.30.2014 11:08   09.30.2014 11:09

BUILDING STRONG®

Equipment constructing berm

09.30.2014

BUILDING STRONG®

Pumping to drain ponds (10/6/2014)

Deep hole constructed as water drained to capture fish. Fish moved to deep water using excavator. (10/6/2014)

Drained ponds (10/6)

Pool 1 (10/6)

Drained Conditions being maintained (10/8/2014)

Near Pump   Pool 1

Drained Pools (10/8)

Pool 2 looking upstream

Pool 2 looking downstream

Staging Equipment to Dredge
(10/10/2014)

BUILDING STRONG®

First Attempts at Excavation
(10/10/2014)

BUILDING STRONG®

10/13/14 Muddy Excavation

BUILDING STRONG®

Keeping it drained and excavating
(10/13/2014)

BUILDING STRONG®

Excavating and Placing
(10/20/2014)

Placement "berm" starting

BUILDING STRONG®

Pool 1 (10/27)

Pool 2 (10/27)

Pool 1 (11/4/2014)

Berm generally constructed (11/25)

Pool 1 (Slopes) 11/25/2014

Pool 1 (1/15/2015)

Pool 1 Status

- In February, plan to finish the south end of Pool 1.
- Surveys of the site are required to be submitted.

BUILDING STRONG®

Pool 2 (11/25/2014)

BUILDING STRONG®

Pool 2 (1/15/2015)

Berm(1/15/2015)

BUILDING STRONG®

Pool 2 (1/26/2015)

BUILDING STRONG®

Pool 2 (1/26/2015)

BUILDING STRONG®

Pool 2 (1/26/2015)

Pool 2 (1/27/2015)

Pool 2 (1/27/2015)

Pool 2

- As of 1/27/2015, contractor was 350 feet from the end of the cut

Stage I: Island Bank Stabilization

Islands Needing Protection
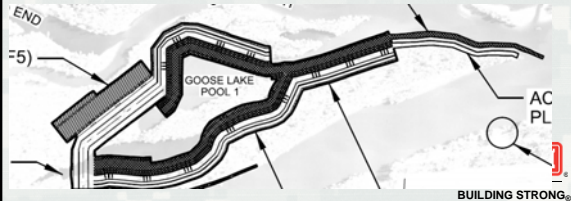
Typical Protection Efforts

Stage I: Garner Chute Closure Structure

Typical Emergent Closure Structure

Stage II

- Shape Stage I Placement Sites
- Construct Berm/Pad Upstream of Pool 1 and 2
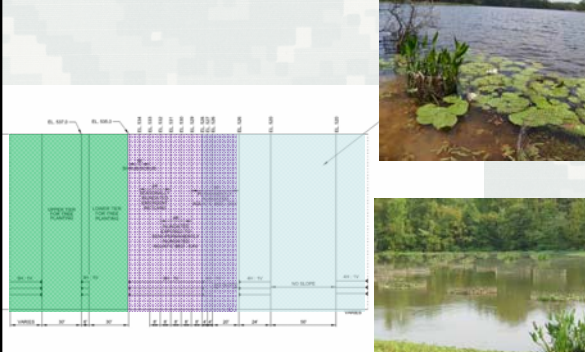- After Stage I completed (FY16 award?)

Stage III

- After Placement Sites are shaped (FY17/18)
- Growing may start sooner
- ERDC Contract
- Aquatic Plantings
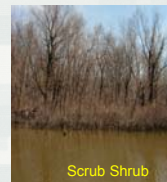- Wetland Plantings
- Floodplain Forest Plantings

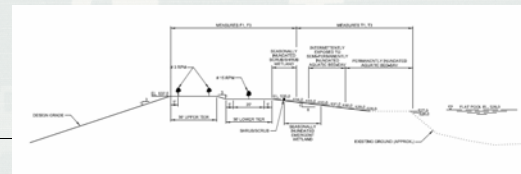## Aquatic Plantings

Forest Diversity
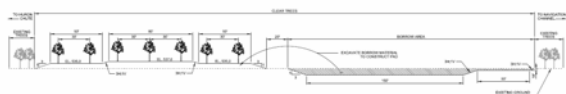

Scrub Shrub

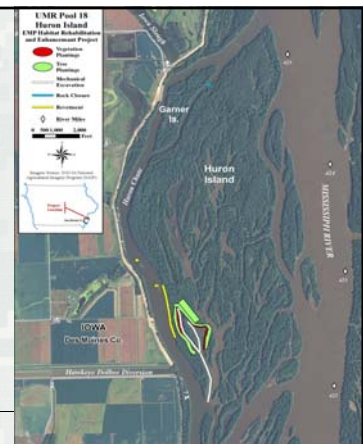RPM Planting

Forest Diversity

Typical RPM Planting

Proposed Site

Questions?

- Photo Credits:
  - CEMVR Project Design Engineers
  - CEMVR Project Construction Engineers and/or QAs

UMRR LTRM Report

UMRR LTRM Fisheries Monitoring in Pool 13
1989-2013
Melvin Bowler

Why Long term fisheries monitoring??
1) UMRS supports multimillion-dollar commercial and sport fisheries;
2) Fishes are indicators of the biotic integrity of the UMRS ecosystem
3) Information about fish populations or communities can inform our understanding of dynamics of other organisms and physical/chemical processes

➢ Factors affecting fish populations can be difficult to determine with short term data:
  ➢ Fish populations highly variable among years
  ➢ Multiple possible causes impedes identification of short-term cause-and-effect relationships.

Fisheries Management Section; 2013 Completion Reports; Iowa DNR

UMRR LTRM Fisheries Monitoring in Pool 13
1989-2013
➢ Pool 13 has a diverse fish community with 94 species documented in the river and the immediate floodplain (64% of the 148 species known to exist in Iowa). LTRM has detected 88 of those species.

➢ Bluegill and largemouth bass proportional stock density values in or near the accepted ranges a balanced population.

➢ Example long-term trend: Yellow perch

Sex-Specific Age Structure, Growth, and Mortality of Black and White Crappie in Pool 13 of the Upper Mississippi River

Melvin Bowler, Kirk Hansen, Kendal Hausmann, and Brandon Reed

➢ Black and White Crappie are particularly prized and sought game fish in the Mississippi River.

➢ Several factors can contribute to shifts in age structure in fish stocks—seasonal and habitat variations, creel and size regulations, and angler harvest.

➢ Objective of this study was to examine the age structure and growth rates of Black and White crappie in Pool 13 to complement ongoing centrarchid studies in e.g., Pool 12 overwintering study.

Iowa DNR; Fisheries Management Section

Sex-Specific Age Structure, Growth, and Mortality of Black and White Crappie in Pool 13 of the UMR

➢ Black crappie growth rates in Pool 13 are moderate—comparable to those observed at the upper end of the lower one-third of selected Wisconsin lakes.

➢ Relative weight metric suggests crappie populations are healthy.

➢ Methodological conclusions that can inform future and ongoing studies:
  ➢ It is unnecessary to separate sexes when looking at growth and population metrics for Black and White crappie in this portion of the river.

  ➢ Otoliths may only need be collected and age estimated once every 5-8 years to accurately assess age and size structure


Evaluating the Effectiveness of a Mandatory Catch and Release Regulation on a Riverine Largemouth Bass Population

Melvin C. Bowler and Kirk A. Hansen

➢ Combined Pool 13 backwater UMRR-LTRM data with site specific monitoring to evaluate the effectiveness of a mandatory catch-and-release regulation in Brown's Lake, a backwater in Pool 13

➢ January 1, 1998 IDNR implemented a mandatory "catch and release" regulation for LMB in Brown's Lake.

➢ Abundance and size structure of largemouth bass improved within three years following, but the effect was temporary.

Fisheries Management Section; 2013 Completion Reports; Iowa DNR

Slide 1

Evaluating the Effectiveness of a Mandatory Catch and Release Regulation on a Riverine Largemouth Bass Population
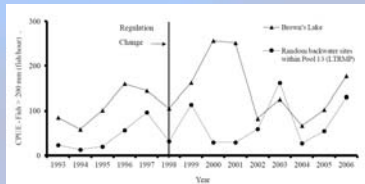
➤ "Spurious conclusions would have been reached if the data collection had been limited to the two or three years immediately following the C-R regulation or if the LTRM dataset was unavailable"

➤ When "two independent fisheries datasets are used in collaboration, they can be particularly valuable to evaluate responses in abundance and size structure…"

Slide 2

Project Updates

Population Dynamics of Invasive Asian Carp in the La Grange Reach of the Illinois River

Levi Solomon, Richard Pendleton, and Andrew Casper

➤ Asian Carp have exhibited substantial population increases within the Illinois River

➤ Objective: to assess age, growth, sex, and mortality trends in Asian carp populations the Illinois River proper and connected habitats in order to monitor and understand change in the population over time.

Slide 3

Population Dynamics of Invasive Asian Carp in the La Grange Reach of the Illinois River

➤ Used postcleithra from Asian carp collected from 2011 – 2014 to estimate age and growth demographics of the population within the La Grange Reach.

➤ Results indicate that 3- 5 year old fish dominated the population
  ➤ Recent lack of successful recruitment to adulthood?
  ➤ Gear bias?
  ➤ Subsequent years of data will clarify

➤ Information will improve our understanding of the relationship between Asian carp population dynamics and factors like flood/drought events, potential changes in commercial fishing pressure, and habitat rehabilitation and enhancement activities.

Slide 4

Project Updates

Collection and archiving of age and growth structure for selected species in the La Grange Reach

Levi Solomon, Richard Pendleton, and Andrew Casper

➤ Better understand population dynamics of selected species of fishes:
  ➤ Included channel catfish, yellow bass, white bass, bluegill, black crappie, white crappie
  ➤ Indicators of ecosystem health
  ➤ Recreationally/commercially valuable

Slide 5

Collection and archiving of age and growth structure for selected species in the La Grange Reach

➤ Began collecting data in 2012 to determine age and sex distribution of selected species.

➤ Initial examination of bluegill data indicates a young population dominated by age 1 and 2 fish. Why?

➤ Inferences gained by this project will augment routine LTRMP monitoring data and may inform management and restoration decisions.

Figure 1: Age structure of bluegill from 2012 and 2013 collected via day electrofishing and fyke netting.

Slide 6
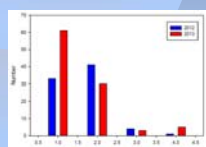
Project Updates

Progress in Evaluating the Efficacy of YSI PISCES Platforms for use in the Great Rivers Ecological Observatory Networks

Dr. John Chick

➤ NGRREC working cooperatively with the UMRR LTRM to evaluate new monitoring platforms capable of collecting real-time data on a wide variety of water quality measures.

➤ High temporal resolution data:
  ➤ Provides insights into ecosystem processes in rivers
  ➤ Improves assessment of nutrient and sediment concentrations and loadings.

Slide 1

**Progress in Evaluating
the Efficacy of YSI PISCES Platforms for use in the
Great Rivers Ecological Observatory Networks**

➢ High resolution data detects short term associations between nitrate and discharge; standard monitoring detects longer term association

➢ Results of both methods are highly correlated

➢ New technology not a replacement for traditional sampling methods because of limitations in spatial resolution

Ellis Bay, Pool 26

Slide 2
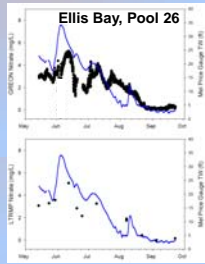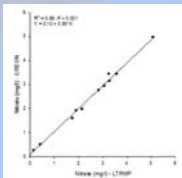

Project Updates
Development of vital rates to assess the relative health of UMRS mussel resources: the use of passively integrated transponder tags

Teresa Newton, Steve Zigler, and Patty Ries

➢ Over the past 50 years, abundance of native mussels has substantially declined in many portions of the UMR.

➢ Traditional measures of mussel populations (species richness, adult abundance) may respond slowly to changes in river conditions and management actions.

➢ Indicators such as population vital rates (e.g., mortality, recruitment, growth) may be more informative.

➢ Objective: develop methods for assessing survival rates using PIT tags.

Slide 3

Development of vital rates to assess the relative health of UMRS mussel resources

➢ Study site: West Newton Chute, Pool 5.

➢ In 2012: Tagged 578 mussels across 20 study plots, including both common (Three-ridge, Threehorn wartyback) and less common (Pimpleback, Round Pigtoe) mussel species.

➢ In 2013, located tagged mussels at 16 of 20 plots.
 ➢ Located from 25 to 97% of tagged mussels
 ➢ Survival rates ranged from 67 to 100%
 ➢ Twelve plots exhibited survival rates > 95%

➢ In 2014: located tagged mussels at 14 of 20 plots.
 ➢ Located from 4 to 52% of tagged mussels
 ➢ Survival rates ranged from 20 to 100 %
 ➢ Average annual survival of located mussels: 68%

➢ PIT tags last for years, so this method may allow long-term monitoring of mussels.

Slide 4
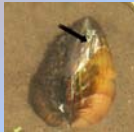
**New UMRR LTRM Staff
Wisconsin DNR
La Crosse Field Station**

John Kalas– Water Quality Specialist
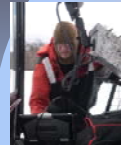
- WQ Technician WDNR UMRR LTRM field station 2012-2015
- Extensive experience monitoring water quality, fish, and mussels
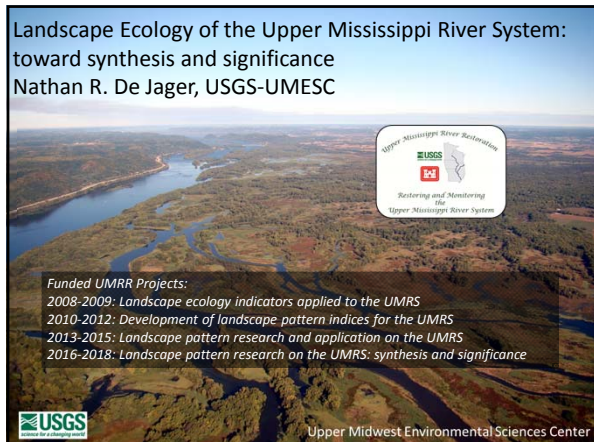
Dr. Deanne Drake–Vegetation Specialist

AREAS OF EXPERTISE
- Freshwater and estuarine nutrient dynamics and limitation
- Plant-soil-water nutrient relations
- Riparian vegetation
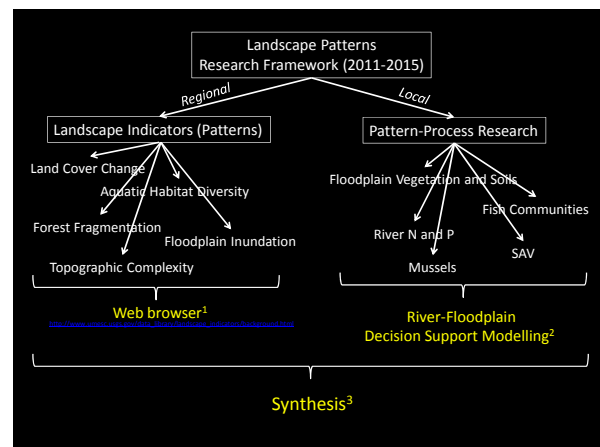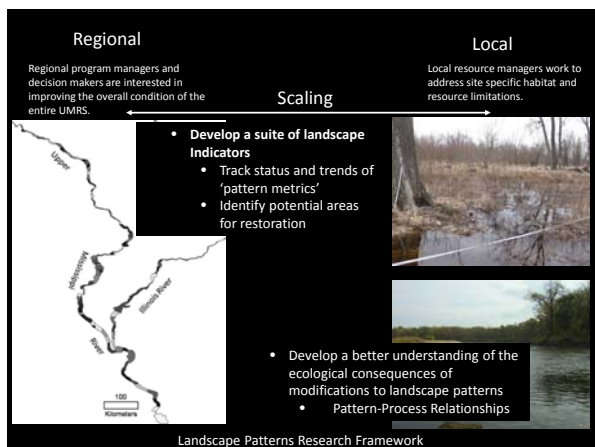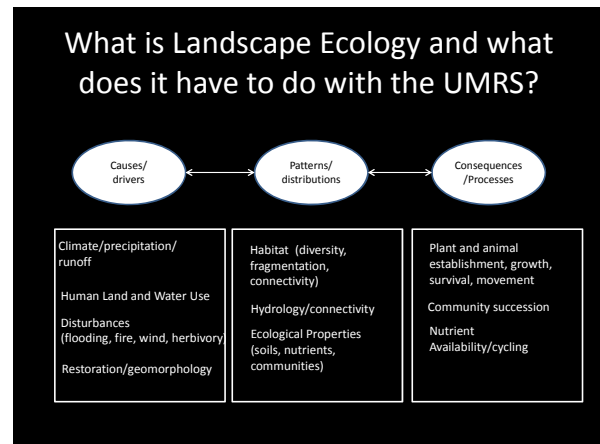- Landscape-scale human impacts on lakes and rivers

Slide 1

Landscape Ecology of the Upper Mississippi River System: toward synthesis and significance
Nathan R. De Jager, USGS-UMESC

Funded UMRR Projects:
2008-2009: Landscape ecology indicators applied to the UMRS
2010-2012: Development of landscape pattern indices for the UMRS
2013-2015: Landscape pattern research and application on the UMRS
2016-2018: Landscape pattern research on the UMRS: synthesis and significance

USGS
science for a changing world

Upper Midwest Environmental Sciences Center

Slide 2

What is Landscape Ecology and what does it have to do with the UMRS?

Causes/ drivers ↔ Patterns/ distributions ↔ Consequences /Processes

Climate/precipitation/ runoff	Habitat (diversity, fragmentation, connectivity)	Plant and animal establishment, growth, survival, movement
Human Land and Water Use	Hydrology/connectivity	Community succession
Disturbances (flooding, fire, wind, herbivory)	Ecological Properties (soils, nutrients, communities)	Nutrient Availability/cycling
Restoration/geomorphology		

Slide 3

Regional

Regional program managers and decision makers are interested in improving the overall condition of the entire UMRS.

Local

Local resource managers work to address site specific habitat and resource limitations.

Scaling

- **Develop a suite of landscape Indicators**
  - Track status and trends of 'pattern metrics'
  - Identify potential areas for restoration

- Develop a better understanding of the ecological consequences of modifications to landscape patterns
  - Pattern-Process Relationships

Landscape Patterns Research Framework

Slide 4

Landscape Patterns
Research Framework (2011-2015)

Regional   *Local*

Landscape Indicators (Patterns)   Pattern-Process Research

Land Cover Change   Floodplain Vegetation and Soils
Aquatic Habitat Diversity   Fish Communities
Forest Fragmentation   Floodplain Inundation   River N and P
Topographic Complexity   Mussels   SAV

Web browser[1]   River-Floodplain
                                        Decision Support Modelling[2]

Synthesis[3]

Slide 5

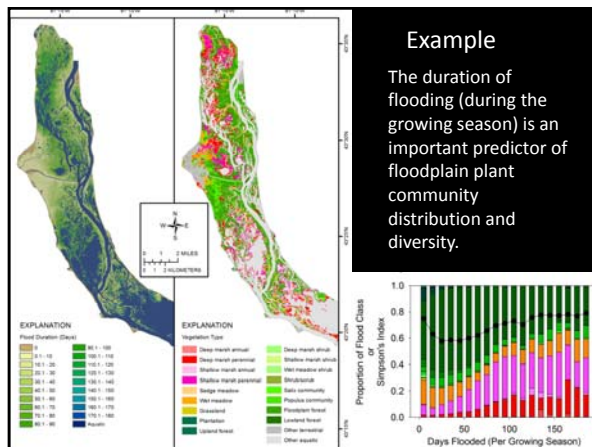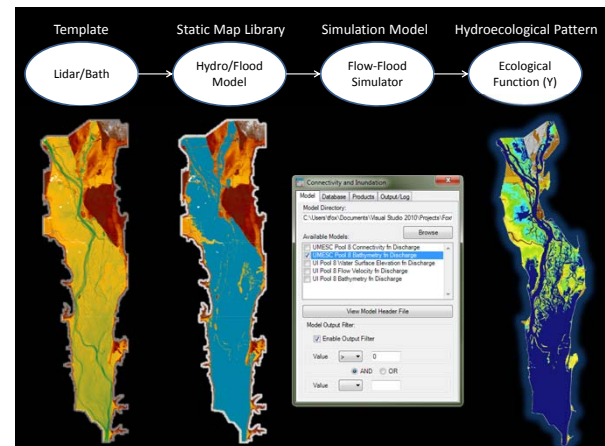# Issues

1. Information OVERLOAD!
2. Landscape Patterns Research Framework
   -Third main objective was to examine the consequences of restoration and climate change on landscape patterns and associated ecological patterns/processes. NOT DONE!

Possible Solutions

1. Synthesis: Review what we have learned so far, across multiple ecological and landscape components. *DISTILL main points.*
2. Model: begin to synthesize results in the form of models and tools that can be used to inform restoration decisions.

Slide 6

Linkages with hydrology, climate, and restoration

Component	River Flow Metric	Floodplain Flood Metric
Nutrient Avail./Cycling	Velocity	Duration
	# Flow Events	# Wet//dry events
Vegetation Diversity	Depth, Velocity	Duration
	#Fluctuations	
Fish Diversity	Velocity, depth	Duration*Volume inundated area
Mussels	Shear Stress	

The distributions of various ecological properties and processes are related to different aspects of the hydrological regime and the elevation template of the river-floodplain.

Given what we are able to quantify regarding ecohydrological distributions, which ecological functions are likely to be supported in different areas of the river-floodplain?

Template — Lidar/Bath
Static Map Library — Hydro/Flood Model
Simulation Model — Flow-Flood Simulator
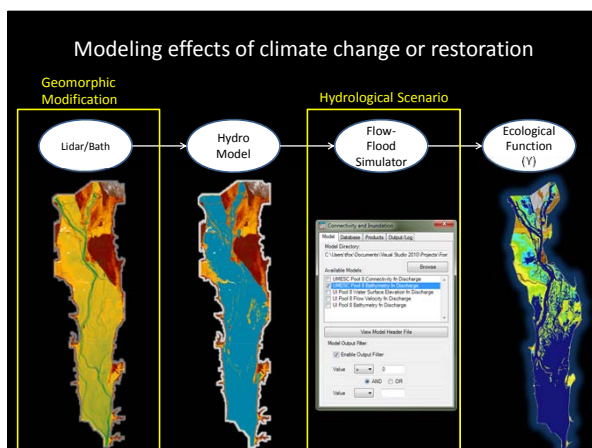Hydroecological Pattern — Ecological Function (Y)

Example

The duration of flooding (during the growing season) is an important predictor of floodplain plant community distribution and diversity.
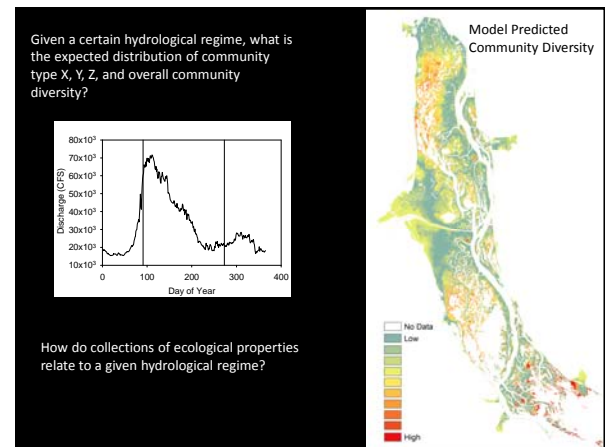
Given a certain hydrological regime, what is the expected distribution of community type X, Y, Z, and overall community diversity?

How do collections of ecological properties relate to a given hydrological regime?

Model Predicted Community Diversity

Modeling effects of climate change or restoration

Geomorphic Modification — Lidar/Bath — Hydro Model
Hydrological Scenario — Flow-Flood Simulator — Ecological Function (Y)

Issues associated with modeling

- Dependent on lidar and/or bathymetry data
  - Expected Completion in FY 2015 (lidar)
- Dependent on flood or flow models
  - Flow models are $$ and rare
  - Flood models are relatively cheap and easy to develop for pools with lidar data.
  - Floodplain application could be more wide-spread
- Dependent on solid hydro-ecological relationships
  - Some are stronger than others (floodplain patterns)
  - Some require additional research (aquatic patterns)
  - Floodplain application will be more 'reliable'

What now?

1) We have so much information on so many different patterns that some level of synthesis would be helpful for researchers and managers.
2) The landscape patterns research framework calls for research into the effects of alternative hydrological regimes and management scenarios on landscape-scale ecological distributions.

Acknowledgements

Publications

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3. De Jager, N.R., Swanson, W., Strauss, E.A., Thomsen, M.T., Yin, Y. In Review, c. Flood pulse effects on nitrification in a floodplain forest impacted by deer browsing and invasion by Phalaris arundinacea. Wetlands Ecology and Management.
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5. Reiss, P., De Jager, N.R., Newton, T., Ziegler, S. In Prep. Multiple scales of patchiness and patch structure of freshwater mussels in the Upper Mississippi River. Freshwater Science.
6. Scown, M., Thoms, M., De Jager, N.R. 2015. Measuring floodplain spatial patterns using continuous surface metrics at multiple scales. Book Chapter.
7. Cogger, B.J. De Jager, N.R. Thomsen, M. 2014. Winter browse selection by white-tailed deer in bottomland forest restorations of the Upper Mississippi River Valley, USA. Natural Areas Journal 34: 144-153.
8. De Jager, N.R. and Fox, T.J. 2013. Curve Fit: A pixel-level raster regression tool for mapping landscape patterns. Methods in Ecology and Evolution 4: 789-792.
9. De Jager, N.R., Cogger, B.J., and Thomsen, M.T. 2013. Interactive effects of flooding and deer browsing on floodplain forest recruitment. Forest Ecology and Management 303:11-19.
10. De Jager, N.R. and Houser, J.N. 2012. Variation in water mediated connectivity influences patch distributions of total nitrogen (TN), total phosphorous (TP) and TN:TP ratios in the Upper Mississippi River, USA. Freshwater Science 31: 1254-1272.
11. De Jager, N.R. 2012. The allometry of community level stem size-density distributions in a floodplain forest. American Journal of Botany 99: 1572-1576.
12. De Jager, N.R. Thomsen, M.T., Yin, Y. 2012. Threshold effects of flood duration on the vegetation and soils of the Upper Mississippi River floodplain, USA. Forest Ecology and Management 270:135-146.
13. De Jager, N.R., Rohweder, J.J., and J.C. Nelson. 2011. Past and predicted future changes in the land cover of the Upper Mississippi River floodplain, USA. River Research and Applications. 10.1002/rra.1615
14. De Jager, N.R. and Rohweder, 2011a. Spatial Patterns of aquatic habitat richness in the Upper Mississippi River floodplain, USA. Ecological Indicators 13:275-283.
15. De Jager, N.R. and Rohweder, J.J. 2011b. Spatial scaling of core and dominant forest cover in the Upper Mississippi and Illinois River floodplains, USA. Landscape Ecology 26: 697-708
16. De Jager, N.R. and Yin, Y. 2010. Temporal changes in spatial patterns of submersed macrophytes in two impounded reaches of the Upper Mississippi River, USA, 1998-2009. River Systems 19:129-141.