Upper Mississippi River Restoration Program Coordinating Committee Quarterly Meeting

February 7, 2018

Highlights and Action Items

<u>Program Management</u>

- **Marshall Plumley will serve as UMRR's new program manager, officially starting on March 4, 2018.** Plumley brings substantial experience working on Corps aquatic ecosystem programs nation-wide, including Puget Sound, Chesapeake Bay, Louisiana's coast, and the Illinois River. **Andy Barnes reflected on Marv Hubbell's successful tenure as UMRR Program Manager. Hubbell has been an important visionary and motivating leader, positioning UMRR well to do incredible habitat restoration and science while also competing for funding within the Corps.** Hubbell will officially retire in June 2018 and will assist Plumley as he assumes the program manager responsibilities.

- Hubbell reflected on the tremendous value of UMRR's partnership, noting the value of each partner's unique strengths that they contribute to the program. The UMRR Coordinating Committee applauded Hubbell for his many contributions to UMRR and thanked him for his dedication to partnership and the resource.

- **Congress passed a second FY 18 continuing resolution authority (CRA) on December 22, 2017 following the expiration of the first CRA on December 8, 2017. The second CRA expires on February 9, 2018. It is not yet known how Congress will act. [Subsequent to the meeting, Congress enacted a third CRA expiring on March 23, 2018.] District staff are authorized to execute the program at $33.17 million.** The House and Senate Appropriations Committees each approved $33.17 million for UMRR in their respective FY 18 energy and water appropriations measures.

- At the $33.17 million planning scenario, UMRR's FY 18 internal allocations are as follows:
  - Regional Administration and Programmatic Efforts – $1,110,000
  - Regional Science and Monitoring – $9,325,000
    - Long term resource monitoring – $4,725,000
    - Regional science in support of restoration – $3,175,000
      - $1.025 million for data analysis
      - $2.15 million for special research initiatives
    - Regional science staff support – $150,000
    - Habitat project evaluations – $975,000
    - Habitat Needs Assessment II – $300,000
  - Habitat Restoration – $22,735,000
    - Model certification (i.e., AHAG) – $100,000
    - MVP – $10,922,000
    - MVR – $5,747,000
    - MVS – $5,966,000

[Note: The FY 18 District HREP allocations above reflect repayment after transferring work among Districts in FY 17.]

- As standard every year, District staff anticipate receiving a pass back on its draft FY 19 spending plans in mid-February.

- **District staff are working to simplify the budget report documents typically supplied in the agenda packets and will begin to include them on a regular basis again starting in May 2018.** Hubbell distributed a handout that provides a clearer way of showing UMRR's financial information. It will also allow for better tracking spending on specific activities over time.

- **Hubbell reflected on UMRR's maturity and milestones throughout his involvement as UMRR's program manager as follows:**
  - Two UMRR long term resource monitoring status and trends reports
  - New approaches for evaluating UMRR's ecological resilience and habitat needs
  - Improvements to the habitat project planning process and evaluation
  - Robust funding with consistent high execution achievements
  - Publication of three reports to Congress

    [Note: Hubbell served as Illinois' UMRR Coordinating Committee representative during the 2004 UMRR Report to Congress development.]
  - Endorsement and signing of a charter for UMRR's coordinating groups

- **In response to the UMRR Coordinating Committee's request on a November 27, 2017 conference call, Corps public relations staff are working internally to create a more concise, strategic UMRR communications plan.** Samantha Heilig said the plan revolves around UMRR's tag line: leading, innovating, partnering. Heilig explained that the communications plan will utilize the partnership's network, rotating leadership responsibilities among the implementing partner agencies. **District staff will prepare a draft plan for the UMRR Communications Team to consider this spring and then will begin developing content.**

UMRR Showcase Presentations

- Julie Millhollin discussed habitat degradation at Steamboat Island and how the potential restoration techniques would improve aquatic habitats and floodplain forest.

Long Term Resource Monitoring and Science

- The following manuscript was published in the first quarter of FY 18, "Can data from disparate long-term fish monitoring programs be used to increase our understanding of regional and continental trends in large river assemblages?"

- **UMESC published a story map for UMRR's long term resource monitoring web site that combines text, images, and video to summarize information in a compelling and understandable way**. The story map can be used for a variety of purposes (e.g., outreach, virtual tours, delivering information) and found here: https://usgs.maps.arcgis.com/apps/MapSeries/index.html?appid=261453998dc844099bdb48d203de b736.

- The January 16-18, 2018 UMRR LTRM Science Meeting facilitated extensive, collaborative dialogue among Upper Mississippi scientists and habitat managers about future goals and priorities for UMRR's research and analysis. While the primary objective was to determine FY 18 research priorities, the meeting also resulted in longer term ideas for future work and enhanced the network

of UMRR's restoration professionals and scientists. Six working groups explored the following themes, which partners reviewed prior to the meeting:

- o Theme 1: Understanding changes in hydrogeomorphology and their implications for the future condition of the UMRS
- o Theme 2: Understanding relationships between hydrogeomorphic conditions and the distribution and abundance of biota
- o Theme 3: Understanding the physical, chemical, and biological processes behind the observed spatial and temporal patterns in LTRM data

- **The anticipated schedule for selecting and funding FY 18 research proposals is as follows**:
  - o March 16: Full proposals due to UMRR management team for review
  - o March 30: Proposals distributed to A-Team for review and evaluation
  - o Early to mid April: A-Team and UMRR federal partners review and rank proposals
  - o April 25: A-Team considers proposal rankings
  - o May 16: UMRR Coordinating Committee consider recommended FY 18 research proposals for endorsement

- UMRR's FY 18 LTRM allocation includes $5.75 million for base monitoring and $2.15 million for other science-related efforts. Actual costs for base monitoring are estimated at $5.6 million in FY 18, allowing for $149,330 to fund aerial camera testing and FY 17 work plan needs as well as other science-related efforts.

- The A-Team's next scheduled meeting is for April 25, 2018.

Habitat Restoration

- The St. Louis District is exploring options to expand the number of sponsors it works with on habitat projects. The District anticipates submitting a final draft feasibility report for Crains Island to MVD in mid to late February for approval in order for the project to be construction-ready in FY 19. A bid is currently open for the Clarence Cannon pump station construction. MVS is finalizing the O&M manual for Ted Shanks before closing out the project.

- The St. Paul District finalized construction of Harpers Slough and is planning a dedication ceremony and tree planting event for this spring. The District has not yet issued an award for Conway Lake given issues with the awards received. It anticipates finalizing an award this spring. District partners have selected Bass Lake Ponds (on the Minnesota River), Lower Pool 10, and Reno Bottoms to advance as its next UMRR habitat projects.

- The Rock Island District awarded a construction contract in early February to repair one large pump stations at Rice Lake. MVR is actively planning on Keithsburg and Steamboat Islands. The District accelerated the planning of Beaver Island and will move the project into construction in FY 18, given reallocated FY 17 money from the St. Paul District. That funding will be repaid in FY 18. MVR is working through the river teams to identify one to three projects to initiate planning within the next several months.

- **Partners at the November 29-30, 2017 UMRR HREP strategic planning meeting discussed a range of issues affecting implementation of habitat projects. The discussion resulted in the following actions:**
  - o Vision statement for habitat restoration – led by Steve Clark, Steve Winter, Kirk Hansen, and Karen Hagerty

- o Project selection in 2018 to 2019 – led by UMRR program manager
- o Project selection process – led by UMRR program manager and UMRBA staff
- o Project formulation – led by Camie Knollenberg, Monique Savage, and Angela Dean
- o Non-federal sponsorship – led by UMRR program manager, UMRBA, TNC, and Audubon

Habitat Needs Assessment II

- **USGS is considering input from all agency partners regarding a manuscript of HNA II's inventory of habitats and ecosystems conditions of the UMRS. A formal USGS review is underway for the manuscript's publication.** Its content is the foundation information by which restoration practitioners will make inferences about habitat needs on the UMRS.

- **A rapid assessment of each indicator will be employed through the individual river teams. The RRAT Exec performed the exercise on January 23 and the FWIC is scheduled to do so on February 20 and the FWWG on February 23.** Given scoring of indicator rankings in various areas of the UMRS, the river teams will determine whether the area (per each indicator) is far from, near to, or at the desired condition. A "HNA II from Information to Management" report will be developed in March and April through the following steps:
  - o Summarize the river teams' rankings at pool and "cluster" scales
  - o Develop new graphics, including spider diagrams
  - o Provide narrative summaries of habitat needs to river teams for review
  - o Conduct a system assessment by comparing cluster-level evaluations

- **An update regarding the system assessment will be provided to the UMRR Coordinating Committee at its May 16, 2018 meeting.** The HNA II Steering Committee and A-Team will be asked to review the draft HNA II from Information to Management report in the early half of summer. A final draft report will be supplied to the UMRR Coordinating Committee for consideration of approval at its August 2018 quarterly meeting. Pending the Committee's approval, the report would be finalized and published in early fall.

Water Level Management

- **The St. Paul District River Resources Forum's Water Level Management Task Force sent a December 28, 2017 letter to the UMRR Coordinating Committee requesting information regarding whether UMRR could and would be willing to fund all or portions of a pool-wide water level reduction and for clarity on related policy questions.**

- **The UMRR Coordinating Committee approved a motion to reply to the Task Force with a letter explaining the Committee's understanding of current policy and desire to explore opportunities for UMRR to implement a pool-wide WLM project should program partners select it as a high priority among other restoration opportunities.**

Other Business

- USGS is currently seeking a research ecologist to fill the position that Yao Yin served.

- The Institute for Journalism and Natural Resources is planning a June 2018 paid fellowship opportunity for 15 to 20 journalists. USGS, UMRBA, and other river partners are working with the Institute's staff to assist in their planning effort. This is a great opportunity to showcase UMRR's science and restoration work throughout the entire river system.

- Marv Hubbell recognized Brad Walker for his many contributions to the Upper Mississippi, including UMRR. Walker plans to retire at the end of February 2018.

- **Upcoming quarterly meetings are as follows:**
  - **May 2018 — St. Louis**
    - UMRBA quarterly meeting — May 15
    - **UMRR Coordinating Committee quarterly meeting — May 16**
  - **August 2018 — La Crosse/UMESC**
    - UMRBA quarterly meeting — August 14
    - **UMRR Coordinating Committee quarterly meeting — August 15**
  - **October 2018 — Twin Cities**
    - UMRBA quarterly meeting — October 30
    - **UMRR Coordinating Committee quarterly meeting — October 31**

UMRR PARTNERS

FY 18 PBUD

President's Budget	$ 33,170,000
House	$
Senate	$
FINAL APPROPRIATION	$

FY18 PLAN OF WORK

TOTAL FY18 Program	**$33,170,000**
Regional Administration and Program Efforts	**$ 1,110,000**
Regional Management	$ 825,000
Program Database	$ 100,000
Program Support Contract (UMRBA)	$ 110,000
Public Outreach	$ 75,000
Regional Science and Monitoring	**$9,325,000**
LTRM (Base Monitoring)	$ 4,725,000
UMRR Regional Science In Support Rehabilitation/Mgmt. (MIPR's, Contracts, and Labor)	$ 3,175,000
UMRR Regional (Integration, Adapt. Mgmt.)	$ 150,000
Habitat Evaluation (**split equally between MVS,MVR,MVP**)	$ 975,000
HNA II	$ 300,000
District Habitat Rehabilitation Efforts (Planning and Construction)	**$22,735,000**
Rock Island District	$ 5,747,000
St. Louis District	$ 5,966,000
St. Paul District	$ 10,922,000
Model Cert. (AHAG)	$ 100,000

FY 19 PBUD

President's Budget	$?????
House	$
Senate	$
FINAL APPROPRIATION	$

UMRR PROGRAM APPROPRIATION/BUDGET HISTORY
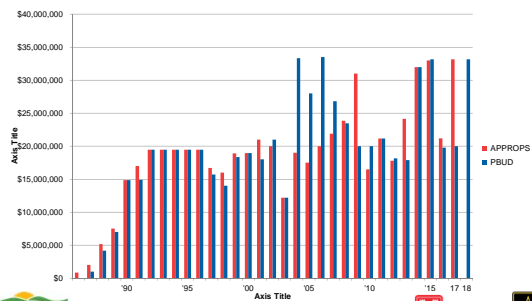
FY1985 to FY2018

MY UMRR HIGHLIGHTS

UMRR Strategic Plan –Program Vision and Integration
    Health Indicators – 2nd Status and Trends Report
    Resilience – New Tools
    HNA II – New Tools
    Next Generation of HREPs – Address evolving needs
    Revise Planning Process - Incorporate New tools
    Evolve Evaluation Tools -Accountability
Funding FY06 – FY18 $327 M   54% Of all funds
Program Execution (92% - 99%)
Four Reports to Congress
Fourth River

SIGNING OUR CHARTER 2013

UMRR PARTNERS

MY UMRR HIGHLIGHTS

Program Operating Approach

PUBLIC COMMUNICATIONS AND OUTREACH

PUBLIC COMMUNICATIONS AND OUTREACH

Angie Freyermuth

FARMERS FOR UMRR

UMRR SHOWCASE

Julie Millhollin

UMRR MONITORING & SCIENCE FY18

2 SOWs in FY18
– SOW for LTRM base monitoring
  $4.725M
– SOW for science in support (analysis under base)
  $1.025M
Both SOWs together **are equivalent to a fully funded UMRR LTRM element $5.75M**
Additional funding for Science $2.15M

UMRR MONITORING & SCIENCE FY2018

LTRM	Initial Budget (gross)	Carry-in	FY 2018 Funds
MN	$583,605		$583,605
WI	$536,939	$20,600	$540,829
IA	$466,456	$31,446	$433,549
Great Rivers (IL)	$413,217		$413,217
Big Rivers & Wetlands (MO)	$385,605		$385,605
IRBS (IL)	$380,001	$64,852	$315,149
Science meeting travel	$ 7,304		$ 7,304
STATES TOTAL	**$2,842,952**	**$116,898**	**$2,678,946**
UMESC TOTAL	**$2,840,624**		**$2,840,624**
Corps tech reps	$ 81,100		$ 81,100
TOTAL FY18 LTRM BUDGET			**$5,600,670**

UMRR MONITORING & SCIENCE FY2018

Fully funded LTRM $5,750,000
LTRM Monitoring $5,600,670
               remaining $ 149,330

Science in Support funding $2,150,000
        TOTAL SCIENCE   **$2,299,330**

UMRR MONITORING & SCIENCE FY2018

Science in Support funding $2,299,330
– Aerial camera testing
     (FY17 workplan, UMESC) $ 67,983
– FY 17 workplan adjustment $ 88

FY18 Science funding   **$2,231,259**
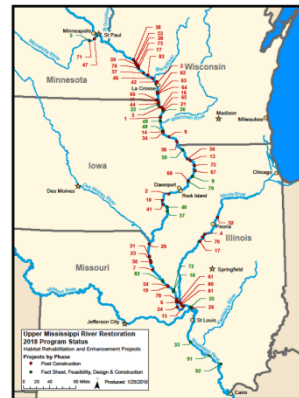
UMRR SCIENCE FY18 TIMELINE

Review & Coordination
– **UMRR CC**
  • Preview today
– **Proposals due 16 March**
– **A-Team on 25 April 2018**
  • Review and prioritize
– **UMRR CC on 16 May**
  • Prioritized proposals for endorsement

UMRR HABITAT REHABILITATION AND ENHANCEMENT PROJECTS

AS OF JANUARY 2018:

56 PROJECTS COMPLETED

BENEFITTING 106,000 AC

20

PROJECT SCHEDULES
OVER THE NEXT 1-3 YEARS

MVS

MVR

MVP

ST. PAUL DISTRICT (MVP)
FY18 HREP WORK PLAN (7 FEB 2018)

PLANNING –
McGregor Lake Islands, Pool 10, WI
  ➢ Complete Feasibility Report
Bass Lake Ponds (MN River)
  ➢ Initiate Draft Feasibility Report
Lower Pool 10, Pool 10, IA
  ➢ Initiate Draft Feasibility Report

Reno Bottoms, Pool 9, MN/IA
  ➢ Fact sheet Approval
  ➢ Review Plan approval

DESIGN –
McGregor Lake Islands, Pool 10, WI
  ➢ Complete contract documents

CONSTRUCTION -
Harpers Slough Islands, Pool 9, IA
  ➢ O&M Manuals and turnover to USFWS. Project Dedication and tree plantings this spring

Conway Lake, Pool 9, IA
  ➢ Award contract in FY 18.

McGregor Lake Islands, Pool 10, WI
  ➢ Award contract in FY 19.

EVALUATION
  ➢ Baseline & Post Project Monitoring
  ➢ Performance Evaluations Ambrough Slough, Island 42, Polander

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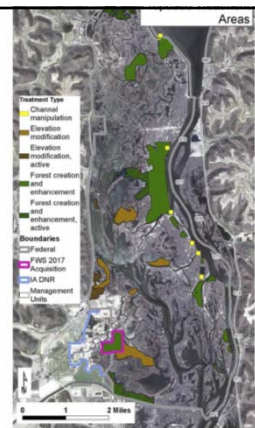
Reno Bottoms – Pool 9

23

Problem Identification

• Increased coverage and dominance of reed canary grass.
• Increased loss of tree and other native plant species diversity.
• Increased loss of forest structural and age class diversity.
• Increased loss of forested land cover.
• Increase in floodplain forest habitat fragmentation.
• Decrease in floodplain forest habitat connectivity.
• Decrease in amount of floodplain forest interior habitat.
• Increase in cumulative adverse impacts on forest-dependent wildlife species.
• Increase in cumulative adverse impacts on local aesthetic and cultural resources.
• Increase in cumulative adverse impacts on ecosystem services (e.g., improvements to water quality).
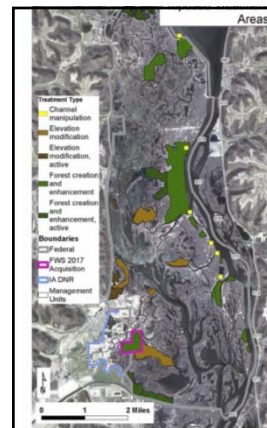
Project Goals - Protect/maintain/enhance the ecological health of floodplain hardwood forests to levels that are sustainable.

24

• Increase topographic diversity and elevation of floodplain areas.
• Increase the extent, patch size, and successional variety of forest communities.
• Restore and maintain large contiguous patches of forest communities.
• Increase habitat corridor sizes and connectivity (focus is on forest-dependent and migratory bird species).

Potential Measures –

• Forest creation and enhancement activities such as understory plantings and timber stand improvement, and reed canary grass management.
• Elevation modification which may include aquatic dredging, dredged material placement, grading.
• Connectivity management activities such as channel manipulations, spillway modifications, and snag removals.

ST. LOUIS DISTRICT (MVS) FY18 HREP WORK PLAN (7 FEB 2018)

PLANNING

Rip Rap Landing, IL
- IPR with MVD
  - Revise Report

Piasa & Eagles Nest Islands, IL
- Initiate MVD Review
- Public Meeting
- Complete Feasibility Report

Crains Open River Island, IL
- Submit for Approval-Feasibility Report

Harlow Open River Islands, MO
- Complete Draft Report

Oakwood Bottoms, IL
- Initiate Feasibility

EVALUATION

Baseline Monitoring & Post Project Monitoring
- Batchtown Mussel Survey

Performance Evaluation – Calhoun Pt, Pharrs Is, Clarksville, & Dresser Is

DESIGN

Clarence Cannon Refuge, MO
- Complete Pump Station Design
- Initiate Riverside Levee Setback Design

DESIGN

Crains Open River Island, IL
- Initiate Design

CONSTRUCTION

Ted Shanks, MO
- Pump Station – Completed
- Reforestation Contract
- Complete O&M Manual

Clarence Cannon Refuge , MO
- *Exterior Gravity Drain Water Control Structure – underway*
- *Interior Water Control Structures and berms - underway*
- *Pump Station Contract Award-*
  - *Feb/Mar 18*

TED SHANKS REFORESTATION

CLARENCE CANNON HREP CONSTRUCTION

ROCK ISLAND DISTRICT (MVR) FY17 HREP WORK PLAN (7 FEB. 2018)

PLANNING
- Keithsburg Division, Pool 18, IL **($420K)**
- Steamboat Island, Pool 14, IA **($730K)**
- **Turkey River Bottoms, Pool 11, IA ($100K)**
- **TBD ($100K)**
- TBD ($100K) ?

DESIGN
- Beaver Island Stage I, Pool 14, IA **($200K)**

CONSTRUCTION
- Pool 12 Overwintering, Pool 12 IL **($575K)**
- Huron Island Stage II & III, Pool 18, IA **($250K)**
- Rice Lake Stage I, IL LaGrange Pool **($150K)**
- **Beaver Island, Pool 14, IA ($3M – 10M)**

EVALUATION
- FWS **($215K)**
- Baseline Monitoring
- Post Project Monitoring
- Performance Evaluations **($200K)**: Bay Island, Andalusia, Brown's Lake, Banner Marsh, Pool 11, Cottonwood Island, Lake Chautauqua
- Adaptive Mgmt. Pool 12

POOL 12
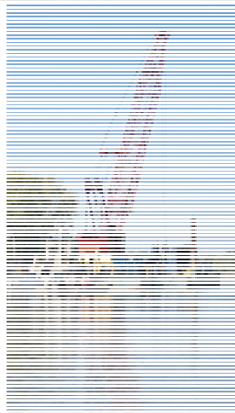
Kehough - Upper channel being dredged.

UMRR SIX YEAR PLAN

UMRR FIVE YEAR PLAN
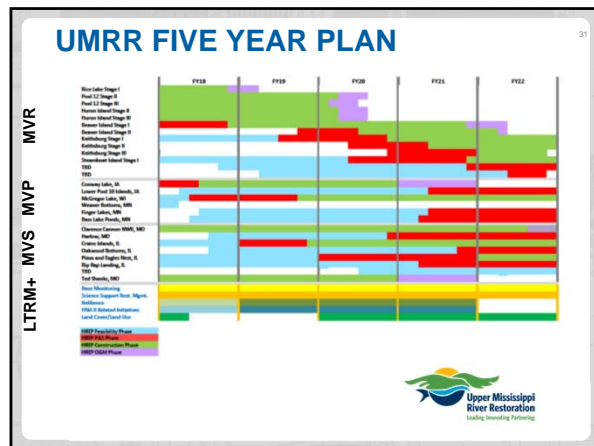
NEXT GENERATION OF PROJECTS

2003 Planning and Sequencing Framework

Goals

Ensure that habitat projects address UMRS ecological needs at pool to system scales and integrate with HNA

Enhance public understanding and trust

Retain flexibility to ensure efficient and effective program execution and apply adaptive management principles

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NEXT GENERATION OF PROJECTS

2003 Planning and Sequencing Framework

Stage I – DETs
Stage II – SET
Stage III – Program Planning

HABITAT NEEDS ASSESSMENT II

Sara Smucker

WLM WORKSHOP SUMMARY

Planning Assistance to States – UMRS Plan

Operations Division – Managing within the operating band

UMRR HREP
Operating outside of the current operating band
Multiple adjustments per shift

NOVEMBER PROGRAM WORKSHOP

Feasibility Reports
Regional standardization
Review 2003 Planning and Sequencing Framework
Need project recommendations – 3rd – 4th Quarter FY19
Approved project fact sheet – 1st Quarter FY20
Able to start initial Feasibility Reports – 2nd Quarter FY20
MVR ID 1-3 UMRR HREP's

Mud Lake Pool 11 July 2006
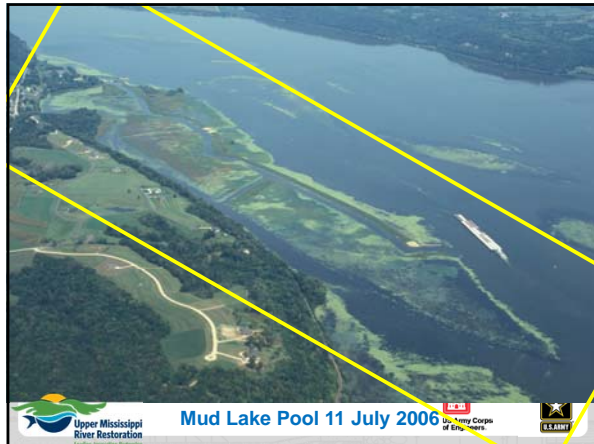
NEXT GENERATION OF PROJECTS

2003 Planning and Sequencing Framework

Who:
    DET = FWIC, FWWG, RRAT Tec., ILWG and
            RRCT, RRF, RRAT Exec.
    SET = System Ecological Team (scientists and managers
    with backgrounds in geomorphology, hydrology, forestry,
    wetlands, fish and wildlife, and limnology)
    PPT = UMRR CC

Slide 1

Slide 2

STEAMBOAT ISLAND HREP

Slide 3

STEAMBOAT ISLAND HREP

Problems:
- Years of silt deposition in off-channel areas has decreased backwater fisheries habitat and allowed willows and silver maples to colonize the once-aquatic portions of the Project area, resulting in degraded aquatic and wetland complexes.
- Higher water tables and the increase in flood frequency and duration over time have affected forest composition and regeneration, as well as reduced species diversity.
- Effects of the impoundment of the UMRS and erosion have reduced the number and acreage of islands in the lower sections of many UMR pools, resulting in the loss of habitat and food sources and the important function of current/wave deflection.

Goals:
- Maintain, enhance and restore quality habitat for native and desirable plant, animal, and fish species
- Maintain, enhance, restore and emulate natural river processes, structures, and functions for a resilient and sustainable ecosystem

Objectives:
- Maintain and/or increase habitat for protected species and species of special concern and refuge priority resources of concern;
- Protect, enhance, and restore areal coverage and diversity of forest stands and habitat and increase hard mast-producing trees, as measures in acres of elevated topography and number of hard-mast tree species present in the Project area;
- Increase year-round aquatic habitat diversity, as measures by acres and native fish use of spawning, rearing, and overwintering habitat;
- Maintain and improve acreage and topography of Steamboat Island and side channel islands;
- Protect backwater and interior wetland areas; and
- Maintain or modify side channel riverine hydrodynamic, sediment transport, and geomorphic processes in the Project area to benefit desirable aquatic habitat.

Slide 4

STEAMBOAT ISLAND HREP

Slide 5

STEAMBOAT ISLAND HREP

Schedule

Steamboat Island HREP (Work Load Priority A26)			
Milestone	Actual	Schedule Date	Activity
	26 Apr 17		Kickoff Meeting/Planning Charrette
12 July 17	17 Jul 17		PMP Approved
	11 Jul 17		Review Plan sent to MVD
18 Sep 17	31 Aug 17	25 Aug 17	Review Plan Approval
		30 Sep 17	Existing Conditions
		30 Sep 17	Project Objectives
	18 Oct 17	30 Oct 17	Start Project Features
	15 Dec 17	30 Nov 17	List of Project Features
		30 Mar 18	Public Meeting
		30 Mar 18	Alternative formulations
		30 May 18	Final Array of Alternatives/ Start HEP analysis
		30 May 18	Cost (formal cost estimate)
		31 Aug 18	Final HEP and Final Cost
		28 Sep 18	Run CE/ICA
		26 Oct 18	Meeting with Sponsors to Determine TSP
		16 Nov 18	Identify TSP
		01 Feb 19	TSP Final
			Send BA to RIFO
			PDT Draft Feasibility
			Start DQC
			Start ATR
			MDM Conference with MVD
			Public Review
			Submit Final Report

Slide 6

STEAMBOAT ISLAND HREP

Data Collected:
- Quantum Spatial contractor was able to fly and collect TopoBathy-LiDAR – "Green LiDAR"
- Green LiDAR is able to penetrate water approx. 1.5 time secchi depth to capture high-density bathymetric data
- Received preliminary transect from LiDAR contractor – 13-Dec-17

X8 Maximum depth observed about 1.25m

Zoomed out view along X3
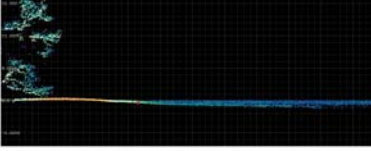
US Army Corps
of Engineers

U.S. ARMY

Slide 1

LTRM Highlights

February 7, 2018
Moline, Illinois

Emiquon; Doug Blodgett

Slide 2

Can data from disparate long-term fish monitoring programs be used to increase our understanding of regional and continental trends in large river assemblages? PLOS ONE 13(1): e0191472

Counihan, T.D., Waite, I.R., **Casper, A.F.**, Ward, D.L., **Sauer, J.S.**, Irwin, E.R., Chapman, C.G.**, Ickes, B.S.**, Paukert, C.P., Kosovich, J.J., Bayer, J.M.

- Used data collected from long term fish monitoring programs to better understand the spatial and temporal trends of large river fish assemblages

- Evaluated data from programs that monitor fishes in the Colorado, Columbia, Illinois, Mississippi, and Tallapoosa rivers

Map of the rivers in which the fish monitoring programs evaluated were conducted.

Slide 3

Can data from disparate long-term fish monitoring programs be used to increase our understanding of regional and continental trends in large river assemblages?. PLOS ONE 13(1): e0191472

- The five rivers examined in this study have commonalities with respect to landscape-level stressors, and to some extent, management actions to mitigate the effects of stressors on fish assemblages.

- Described significant spatial and temporal trends in all five rivers.

- Using information from existing programs over broad geographical scales, we can identify opportunities for learning across established programs. Increased knowledge of factors affecting large river resources at broad geographical scales will help managers better formulate policy that addresses emerging issues at spatial scales much larger than the individual programs allow.

Slide 4

Upper Mississippi River Restoration Program
Long Term Resource Monitoring
Story Map

Jayme Stone (lead), JC Nelson, and Enrika Hlavacek (UMESC)

- Story Maps let you combine maps with text, images, and video to tell a story.
- Used for a wide variety of purposes such as outreach, virtual tours, and delivering information.

Slide 5

UMRR Long Term Resource Monitoring
Story Map

The UMRR LTRM Story Map gives the viewers a flavor of the LTRM history and data/information available.

Includes links so one can explore more of the rich LTRM data, information, reports, and manuscripts available to the public.

Slide 6

UMRR Long Term Resource Monitoring
Story Map—Examples

Total Suspended Solids

Trends CPUE

Zoom to Study Area

Topobathy

Follow link on UMRR LTRM webpage to find the Story Map
(https://www.umesc.usgs.gov/ltrmp.html)

2018 UMRR Science Meeting

16 -18 January 2018
La Crosse, Wisconsin

UMRR 2018 Science Meeting Participating Agencies

- USACE, USGS, USFWS
- MDNR, WDNR, IADNR, INHS, MDC, UMRBA
- National Great Rivers Research and Education Center
- UW-La Crosse, UW-Stevens Point, Southern Illinois University, West Virginia University

An Unusual Opportunity

- 2018 funding
- River/floodplain science ⇄ River/floodplain restoration
- Mix of extensive experience and fresh perspectives
- Time to think and discuss

Photo provided by J. Janvrin (WDNR)

The Basic Idea

Previous work
- River science
- Restoration projects
- Restoration objectives

(2018 Focal areas)

+ River/Floodplain scientists / Restoration professionals + Time / Resources → Collaborative, Relevant, Projects
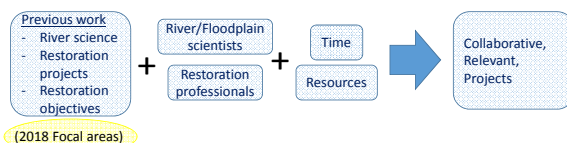
2018 Science Focal Areas (see C20 - C25 in meeting packet)

- Purpose: Distill existing research frameworks, and previous reports & publications into a few focal areas for 2018
- Premise:
  - Restoration projects generally modify/restore river geomorphology (depth, connectivity, fetch, topographic diversity, etc.) in order to rehabilitate various physical, chemical and biological conditions.
  - Selection and design of restoration projects would benefit from a better understanding of the likely future geomorphology of the river and the implications for biota.
- Initial draft of focal areas distributed in November as read ahead for 19 November Webinar.
- Webinar feedback and written comments incorporated into working draft used for the science meeting.

Themes for 2018 focal areas

- Theme 1: Understanding changes in hydrogeomorphology and their implications for the future condition of the UMRS
- Theme 2: Understanding relationships between hydrogeomorphic conditions and the distribution/abundance of biota
- Theme 3: Understanding the physical, chemical, and biological processes behind the observed spatial and temporal patterns in LTRM data

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UMRR is well-equipped to address these themes

- LTRM
  - Systemic data sets (topobathy, land cover)
  - Detailed biotic and biogeochemical data
  - Extensive analytical and ecological expertise
  - Infrastructure and expertise to strategically and efficiently collect additional data
- HREP
  - Large scale manipulations of fundamental ecological drivers
  - Ongoing opportunities to learn about how the river responds (e.g., Finger Lakes; Pool 12 overwintering studies)

Meeting Goals

- Primary goal: Develop proposals for consideration in FY 2018.

- Other meeting outcomes:
  - Ideas for future work
  - Better network of restoration professionals and river/floodplain scientists

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Meeting Agenda

Tuesday afternoon
- Introductions / Logistics / Overview Presentation
- Initial working group discussions

Wednesday Morning
- Work groups reconvene and develop initial outlines of proposals.

Wednesday Afternoon
- Working groups continue work on proposal outlines and develop brief presentation for plenary session.
- **Plenary session presentations:** Working groups 1, 2, and 3

Wednesday evening
- Dinner and Social

Thursday morning:
- **Plenary Session presentations Working Groups 4, 5, and 6.**
- Discussion of next steps

Thursday afternoon
Working group wrap-up discussions.

Working groups & leaders (see C-12 – C17 in packet)

Working Groups	Leads
Working Group 1. Geomorphic Change in the UMRS	Jim Rogala (USGS) and Jon Hendrickson (USACE)
Working Group 2. Interactions among water quality, aquatic vegetation, and wildlife	Deanne Drake (WDNR), Eric Lund (MDNR), and Stephen Winter (USFWS)
Working Group 3. Native freshwater mussels in the UMRS: identification of associations among critical biological processes and hydrogeomorphology	Teresa Newton (USGS)
Working Group 4. Understanding relationships among floodplain hydrogeomorphic patterns, vegetation and soil processes, and nutrient cycling	Nate De Jager (USGS)
Working Group 5. Woody debris in the UMRS: Quantity, distribution, and role in the hydrogeomorphology and ecology UMRS:	KathiJo Jankowski (USGS) and Molly Van Appledorn (USGS)
Working Group 6. Understanding critical biological rates for select fishes of the UMRS and how they vary across hydrogeomorphic, climatic, and biological gradients	Kristen Bouska (USGS), Andy Bartels (WDNR), and Quinton Phelps (WVU)

WG1: Geomorphic Change in the UMRS

General framework for the study of Geomorphic Change

PATTERNS AND PROCESSES
What are the causes & patterns of geomorphic and hydraulic changes within the UMRS?

RATES OF CHANGES
What are the rates of geomorphic and hydraulic changes in the UMRS?

FUTURE CONDITIONS (and recent changes): What is occurring systematically within the UMRS that has altered, or will alter into the future, water depth and connectivity of aquatic habitats and inundation of terrestrial habitats?

WG1: Geomorphic Change in the UMRS

1. Form a working group and convene a workshop to: Develop a hydrogeomorhology-based conceptual model, hierarchical classification system, and a prototype GIS database framework (Lead: F. Fitzpatrick (USGS-WI WSC))
  1) Review existing work on the UMRS (e.g., Cumulative Effects Study)
  2) Conceptual hydrogeomorphic model for the UMRS
  3) Classification system to describe sedimentation and flow in the UMRS
  4) GIS database framework

Example Conceptual Model from Missouri River (Skalak et al. 2013)

WG1: Geomorphic Change in the UMRS

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  4) GIS database framework

2. Measure and better understand geomorphic rates of changes (Lead: J. Rogala (USGS UMESC))
  1) Hydroacoustic surveys in selected study areas
  2) Establish transects in backwaters to measure sedimentation rates
  3) Determine planform changes using UMRR land cover datasets
  • All findings will be added to the GIS framework developed in #1

3. Develop a better understanding of changes in connectivity using existing flow data. (Lead: J Hendrickson, USACE)
  1) Determine changes in water exchange rates between channels and backwaters over last 3 decade
  2) Estimate the future trajectory of water exchange based on these changes
  • All findings will be added to the GIS framework developed in # 1

WG2. Interactions among water quality, aquatic vegetation and wildlife

Title	Research Question(s)	Leads
Internal and external drivers of water clarity in the UMRS	Is water clarity in the UMRS driven by inputs from the watershed or biological drivers within the pools?	Drake & Carhart (WDNR)

WG2. Interactions among water quality, aquatic vegetation and wildlife

Title	Research question(s)	Leads
How do fluctuations in water level and water clarity affect distribution of SAV in the UMRS?	To what extent do water level fluctuations vary among/within pools?	Kalas & Carhart (WDNR)
	To what extent do photic zones vary among/within pools?	
	Does water level fluctuation in the context of photic zone explain SAV distribution?	

Project leads

LTRM
Deanne Drake (WI DNR)
Alicia Carhart (WI DNR)
John Kalas (WI DNR)

UW-La Crosse
Eric Strauss (UW-La Crosse)

UW-Stevens Point
Jacob Straub
Rachel Schultz

USFWS
Stephen Winter

WG3: Native Freshwater Mussels

- Title: Systemic analysis of hydrogeomorphic influences on native freshwater mussels
- Research question: *Which hydrogeomorphic features are predictive of mussel distribution, abundance, diversity, and recruitment*
- Objectives:
  - Estimate the number, species abundance, and distribution of mussels in two reaches (Pools 8 and 26) of the UMR
  - Identify geomorphic gradients in physical habitat conditions across six navigation pools of the UMR
  - Assess if geomorphic metrics are predictive of the distribution, abundance, diversity, and recruitment of native mussels in the UMR

Relevance to UMRR

- Mussels are good indicators of riverine health (e.g., long-lived, sessile, linked to other ecosystem components)
- Because of their imperiled status, they are of significant management concern to States, Federal agencies, and non-governmental organizations
- Responsive to hydrophysical gradients (e.g., substrate stability)
- Data can be used to inform systemic, reach, or pool scale habitat project planning
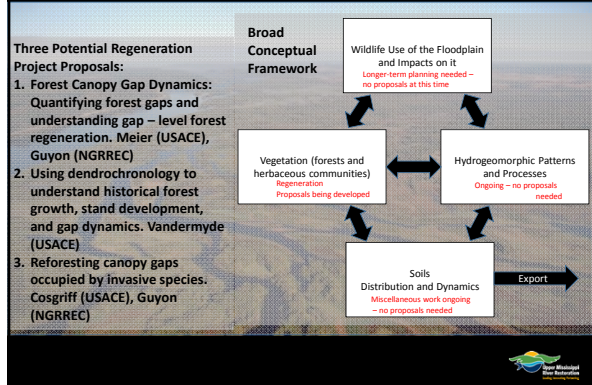
Basic Approach

- Data sets:
  - Conduct pool-wide sampling for mussels in Pools 8 and 26
  - Use existing data in Pools 3, 5, 6, and 18
- Review the existing HNA2 metrics and select those that are likely to influence mussel distributions
- Possible mussel response metrics: presence/absence, total abundance, abundance of individual species, abundance of adults, abundance of juveniles, diversity, age, length
- Use univariate and multivariate analyses to explore patterns in mussel responses across a gradient of geomorphic metrics

Collaborators & Roles

- USGS: Lead, GIS analyses, report
- USFWS: Field work support
- USACE (St. Paul): Field work support
- USACE (ERDC): Statistical analyses
- MN DNR: Sample collection in Pools 8 & 26, data entry
- INHS: Field work support

WG 4: Floodplain Forest

Three Potential Regeneration Project Proposals:
1. **Forest Canopy Gap Dynamics: Quantifying forest gaps and understanding gap – level forest regeneration.** Meier (USACE), Guyon (NGRREC)
2. **Using dendrochronology to understand historical forest growth, stand development, and gap dynamics.** Vandermyde (USACE)
3. **Reforesting canopy gaps occupied by invasive species.** Cosgriff (USACE), Guyon (NGRREC)

Broad Conceptual Framework

Wildlife Use of the Floodplain and Impacts on it
Longer-term planning needed – no proposals at this time

Vegetation (forests and herbaceous communities)
Regeneration
Proposals being developed

Hydrogeomorphic Patterns and Processes
Ongoing – no proposals needed

Soils
Distribution and Dynamics
Miscellaneous work ongoing – no proposals needed

Export

WG 5: Woody debris in the UMRS: Quantity, distribution, and role in hydrogeomorphology and ecology
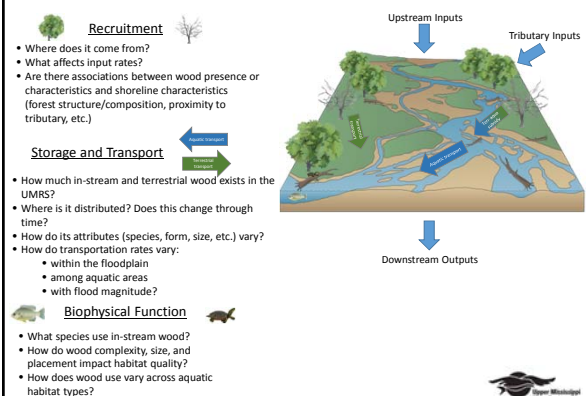
Working group members:

USGS: Molly VanAppledorn, KathiJo Jankowski, Jason Rohweder, Larry Robinson, John Manier; USACE: Dave Potter, Kip Runyon; MN DNR: Dan Dieterman, Rob Burdis; IA DNR: Travis Kueter; INHS - AL: John Chick, Ben Lubinski, Kris Maxson; MDOC: Molly Sobotka

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Why woody debris?

- **Much is known about biophysical role and restoration practices for woody debris in smaller river systems, but not for large rivers**
- **Growing interest in using wood as a restoration tool in large rivers**
  - Some existing use in UMR projects
- **Why care about wood in the UMRS?**
  - Historically removed, forests degraded
  - Poorly understood
  - Major component of habitat structure
  - Link between forest succession and disturbances and instream processes
  - Potential for development or enhancement of HREPs

Map courtesy of U.S. Geological Survey

Conceptual Model of Woody Debris

Recruitment
- Where does it come from?
- What affects input rates?
- Are there associations between wood presence or characteristics and shoreline characteristics (forest structure/composition, proximity to tributary, etc.)

Storage and Transport
- How much in-stream and terrestrial wood exists in the UMRS?
- Where is it distributed? Does this change through time?
- How do its attributes (species, form, size, etc.) vary?
- How do transportation rates vary:
  - within the floodplain
  - among aquatic areas
  - with flood magnitude?

Biophysical Function
- What species use in-stream wood?
- How do wood complexity, size, and placement impact habitat quality?
- How does wood use vary across aquatic habitat types?

Upstream Inputs

Tributary Inputs

Downstream Outputs

Main Research Questions & Approaches

- What is the distribution, recruitment and transport of woody debris in the UMR? What are the important drivers/constraints of these processes?
  - Current inventory/distribution – Sonar & aerial surveys in 3-6 LTRM pools
  - Understanding of transport and recruitment – Wood budgets in 2-3 LTRM pools
- What is the biophysical role of wood in the UMR, and does that vary across hydrogeomorphic settings? *(hydraulics, sedimentation, channel grade control, shade, primary and secondary production, fish habitat)*
  - Analysis of existing LTRM fisheries data (wood presence/absence → fish abundance, community composition?)
  - Enhance fisheries electrofishing surveys to include more quantitative information on wood
  - Additional field surveys to assess habitat associated with existing wood across hydrogeomorphic settings

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Expected outcomes

- Geospatial dataset of wood distribution
- Wood budget of 2-3 contrasting pools
- Potential reports/manuscripts:
  - Linking geophysical drivers to current wood distribution
  - Change in wood load along gradients of discharge
  - Relative role of woody debris in structuring habitat in different aquatic areas and reaches of the UMR
- Baseline information to inform management:
  - Where is wood lacking currently and where will it be going forward?
  - Where will wood placement more effectively create habitat?

WG6: Understanding critical biological rates for select fishes of the UMRS and how they vary across hydrogeomorphic, climatic, and biological gradients

Title:
Investigating vital rate drivers of UMRS fishes to support management and restoration

Leads:
Andy Bartels (WI DNR)
Kristen Bouska (UMESC)
Quinton Phelps (WVU)

Research Questions

Vital Rates

1) Can we combine vital rate data (new) with LTRM data (existing) to characterize short-term (3-5 years) population status (age structure, growth rates, recruitment, mortality)?

2) Do variations in vital rates within and across species correspond with abiotic and biotic drivers and hydrogeomorphology in LTRM reaches?

Microchemistry

3) To what extent are spatial and temporal patterns in recruitment/year class strength driven by "local" recruits vs. immigrants?

4) Are strong year classes associated with particular natal environments, and are these patterns consistent among river reaches?

Genetics

5) Can we define distinct genetic stocks in the UMRS?

6) Is genetic structure a driver of vital rates?


Post-meeting survey summary

- Basic concept of substantial time in work groups to develop project proposals was popular. Most seemed to appreciate the minimal structure imposed on the working group discussions and the overall structure of the meeting.
- The meeting was valuable for developing (or renewing) collaborative connections and generally interacting with folks from across the partnership
- Having expected outcomes identified to focus effort at the meeting was viewed as important for making the meeting productive.
- Opinion on the plenary sessions were mixed. Some seemed to think it a strength of the meeting, others didn't find it a good use of time.
- More time for attendees to prepare and a little more information (presented in a better organized way), further in advance were suggested.
- Many would like to see more time and a better mechanism for interactions among groups
- Some wanted a longer meeting, some thought it was about right, & a few thought it was already too long.
- There were some suggestions to focus the meeting even further in the future--building it around a more specific theme.

Next steps for 2018 Proposals

- 16 March 2018: Full proposals due to UMRR Management Team for initial review.
- 30 March 2018: Proposals distributed to A team for review and evaluation
- A-team (States and USFWS), UMESC and USACE will review and rate proposals before the A team meeting
- 25 April: Discuss proposal rankings at quarterly A-team meeting.
- Early May: UMRR Management team makes final decisions with A team chair in attendance
- 16 May: UMRR CC meeting: Recommended proposals will be presented and the endorsement of the Committee will be requested.
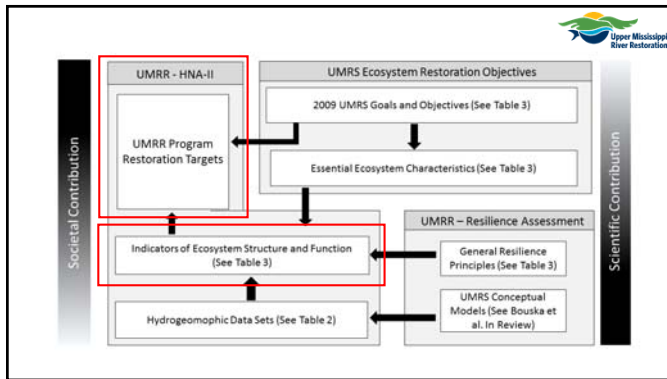
Indicators of ecosystem structure and function

- Being used as 'information content' in HNA-II by River Teams
- Also In Review:
  - USGS (Official Reviews)
    - Supervisory
    - Anonymous
  - Partner Reviewers
    - INHS
    - MN DNR
    - USACE
    - IDNR
    - USGS
    - All partners have provided feedback on earlier drafts via the steering committee
- Next Steps: reconcile reviews, and submit for USGS approval for publication

From Information to Management

River Team Workshops
- RRAT Exec: January 23
- FWIC: February 20
- FWWG: February 23

- Goal: Conduct a rapid assessment of each indicator developed in the report (see previous slide)
  - Red-Yellow-Green Assessment
    - Red: Substantial deviations from your defined desired condition; creating severe negative conditions that merit action.
    - Yellow: existing condition is near your defined desired condition, but may merit actions to maintain or improve conditions.
    - Green: existing condition meets your defined desired condition, continuation of management and monitoring may still be needed to maintain "green" status.
  - Additional narrative statements to clarify remarks and provide reference conditions
- Identify future needs and desired next steps
  - i.e., setting desired future conditions, system-wide data needs, etc

HNA-II Indicators
(Subset of resilience indicators agreed upon by the Steering Committee)

- Connectivity
  - Longitudinal (Aquatic)
  - Longitudinal (Floodplain)
  - Lateral (River-Floodplain)
- Diversity and Redundancy
  - Aquatic Hydrogeomorphic Areas
    - *Lentic functional classes*
    - *Lotic functional classes*
  - Aquatic Vegetation
  - Floodplain Hydrogeomorphic Areas (*Floodplain functional classes*)
  - Floodplain Vegetation
- Slow Variables and Feedbacks
  - Water Surface Elevation Fluctuations
  - Total Suspended Solids Concentrations
  - Sedimentation in Off-Channel Areas
  - Floodplain Forest Succession

Pool and Cluster Scales
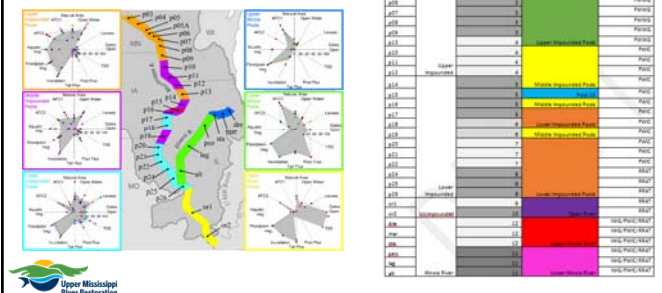
Example 1

1. **Longitudinal connectivity - % time gates open (Pages 34-35; Figure 5)**

| | Longitudinal Aquatic Connectivity | | | | | | | |
| | % Time Gates Open | | | | | | | |
Pool	Pool Mean	Red	Yellow	Green	Cluster Group	Cluster Mean	Red	Yellow	Green
or1	100								
or2	100				Open River	100			X

Longitudinal Aquatic Connectivity
- Aspect of General Resilience: Connectivity
- Definition: Average % of days that dam gates were in "open river" conditions annually; 1985-1994 & 2006-2015.
- Purpose: Indicator for unobstructed flow and movement for migratory fishes (% time gates open)

Example 1 (draft RRAT Exec notes)

1. **Longitudinal connectivity - % time gates open** (Pages 34-35; Figure 5)

					Longitudinal Aquatic Connectivity				
			% Time Gates Open						
Pool	Pool Mean	Red	Yellow	Green	Cluster Group	Cluster Mean	Red	Yellow	Green
or1	100		X						
or2	100			X	Open River	100			X

ALL Agencies put GREEN; RRAT = GREEN

a. As written, not a very a good indicator for us
b. 100%; everyone put green.
c. Zog – with the open river, green is correct indicator, but there are localized longitudinal connectivity issues (dikes, channel crossovers, etc), that aren't captured by this indicator, I've discussed about this to dejager before. This indicator only captures one aspect of longitudinal connectivity; we have longitudinal connectivity issues related to wing dikes and closing structures. This is where we have opportunities for restoration
d. Dejager – we can capture this in the overall narrative in the document. Not sure exactly how this will play out, but that's how this can be addressed.
e. Matt M = this is not an issue
f. Still have issues with localized connectivity issues, such as closing structures in side channels and wing dikes

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Example 2

9. **Floodplain functional class diversity** - page 64; Appx B

					floodplain functional class diversity (Simpson's)				
Pool	Pool Mean	Red	Yellow	Green	Cluster Group	Cluster Mean	Red	Yellow	Green
Or1	0.799465								
Or2	0.789369				Open River	0.79			

Floodplain functional class diversity
- Aspect of General Resilience: Diversity and Redundancy
- Definition: Based off modeled surface-water inundation dynamics; areas expected to experience different total growing season inundation durations based on average hydrologic conditions from 1972 to 2011; Simpon's Diversity Index
- Purpose: Indicator of inundation diversity; indicator of hydrogeomorphic variability of non-aquatic areas

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Example 2 (draft RRAT Exec notes)

9. **Floodplain functional class diversity** - page 64; Appx B

					floodplain functional class diversity (Simpson's)				
Pool	Pool Mean	Red	Yellow	Green	Cluster Group	Cluster Mean	Red	Yellow	Green
Or1	0.799465		MFIU						
Or2	0.789369				Open River	0.79		X	

a. RRAT = yellow for pools and clusters
   i. Desire to increase more diversity of inundation periods across the system; too much area in 0-20 days compared to longer duration periods (more desirable)
   ii. High index overall but not an even mix; desire for more ridge and swales
b. hydraulic routing around the floodplain; low then tends to have more uneven distribution of the floodplain water (duration during the growing season) everything stay inundated stays inundated at the same time, only looks at areas outside the levees/unleveed areas (riverside of levees). We have a low topographic diversity and could use more ridge and swale which would provide greater opportunities for a variety of inundation lengths during the growing season. In the MMR inundation of the batture lands is experience the same duration lengths, would like to increase that diversity.
c. MDC-Yellow, have a high index, there is a low proportional of geomorphic variability, only includes non-leveed areas, lose a lot of topographic variability (ridge and swale action)
d. FWS-Yellow, the scores are high, which is surprising. Still need more deeper backwaters, move back levees. Missing deep lentic (longer duration days), more natural hydrograph or move dirt
e. Need more duration diversity (greater than 60 days), waters recede quickly
f. Il DNR- Yellow, based on the score

Next Steps

- Summarize narratives at pool and "cluster" scales
  - Gather any additional indicator detail, as needed
  - Address any questions generated through workshop exercises
- Develop new graphics (spider diagrams, etc.)
- Send narrative summaries out to river teams for review and refinement
- Conduct system assessment by comparing each cluster-level evaluation across the system.
  - This will help guide where in the system there may be more need for restoration based on existing condition data
- Synthesize draft "HNA II from Information to Management" report:
  - Narrative summaries for pool and cluster scales
  - System assessment
  - Next steps

2018 Schedule

- Jan-March
  - River teams perform preliminary red-yellow-green assessment
  - compile next steps/future work/desired data sets (Steering Committee/River Teams)
- Feb UMRR-CC – status update
- March-April – compile red-yellow-green results; make new graphics; start writing narrative
- May UMRR-CC- provide update on red-yellow-green assessment
- June - report writing
- June/July – Steering Committee/A-Team review of draft assessment
- July/August – UMRR-CC review/concurrence of draft assessment
- August-Sept – finalize assessment for partnership