Upper Mississippi River Restoration

Leading · Innovating · Partnering

2015-2025 Strategic Plan Review Report

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Executive Summary

In summer 2021, the Upper Mississippi River Restoration (UMRR) Coordinating Committee requested an interim review of the UMRR 2015-2025 Strategic Plan by the broad program partnership. The purposes for this review were to seek input regarding progress achieved since 2015, priorities for the remainder of the planning period, and issue areas to include in the 2022 Report to Congress.

On September 20, 2021, a survey was distributed to the UMRR partnership at-large regarding the 2015-2025 Strategic and Operational Plan. The distribution list included 200 individuals from state and federal agencies and non-governmental organizations involved in implementation of UMRR. Fifty-eight responses were received for a 29 percent response rate.

The survey included questions about respondents' relation to, and involvement in, UMRR and their assessment of UMRR. Participants evaluated success criteria for three of the four goals outlined in the strategic plan using a five-point Likert-scale from *strongly disagree* to *strongly agree*; no success criteria were available for Goal 3 – i.e., communications. Additionally, participants prioritized actions meant to support each goal also using a five-point scale from *not a priority* to *highest priority*. Results are presented with *agree* and *strongly agree* response options for success criteria and *not a priority* and *low priority* response options for priority actions combined.

Program Success

The survey results conclude that UMRR partners believe that the program has been largely successful in meeting the success criteria outlined in the 2015-2025 UMRR Strategic and Operational Plan. A majority of respondents agreed or strongly agreed with each of the following success criteria:

Goal 1 Enhance Habitat

- ✓ *Restoration projects provide opportunities for scientific research and inquiry*
- ✓ *HREPs enhance the health and resilience of the UMR*
- ✓ *UMRR serves as a source of guidance on restoration for similar programs nationally*
- ✓ *UMRR is recognized as a premier program in large river restoration*

Goal 2 Advance Knowledge

- ✓ *Research and monitoring inform restoration and management efforts*
- ✓ *UMRR is recognized as a premier program in large river monitoring and science*
- ✓ *UMRR serves as a source of guidance on monitoring and science for similar programs nationally*
- ✓ *UMRR effectively detects the status and trends of the UMR as related to indicators of ecosystem health and resilience*

Goal 3 Communications

[No success criteria were available for Goal 3.]

Goal 4 Partnership

- ✓ *The partnership is supportive of the program and its output*
- ✓ *UMRR has a highly engaged regional partnership*

Participants pointed to the following areas needing additional programmatic attention including:

- Identifying how UMRR can serve as a resource or model internationally
- Understanding UMRR's progress in improving the ecological condition of the river
- Better communicating about the ecological status and trends of the UMRS

[Note: This survey was conducted prior to the publication of the Ecological Status and Trends of the Upper Mississippi and Illinois Rivers.]

Priority Actions

A majority of respondents indicated the following actions to be of high or highest priority to support each goal:

Goal 1 Enhance Habitat

- *Centralize HREP data and collect and digitize historic data currently stored in computers and file cabinets*
- *Establish consistent and standardized HREP monitoring*
- *Complete HREP project evaluation reports (PERs) across districts*
- *Define appropriate temporal and spatial scales for determining physical and biotic response of habitat project objectives*

Goal 2 Advance Knowledge

- *Connect resilience concepts with ongoing and future restoration work*

Goal 3 Communications

- *Link together habitat restoration projects with existing watershed projects and upstream contributors*

Goal 4 Partnership

- *Create a narrative around missed restoration opportunities because of existing policies*

Additional Considerations

Respondents suggested additional items for the UMRR Coordinating Committee to discuss in conjunction with setting priorities following the review of the 2015-2025 UMRR Strategic and Operational Plan. Programmatic items included:

- Resolving disparities amongst agency priorities and missions.
- Adequately resourcing programmatic communication efforts.
- Better conveying the importance of science to the program.
- Efficiently completing after action reviews to inform future project planning.

Other items focused more externally such as:

- Addressing tributary and watershed issues to improve river ecosystem conditions by expanding the scope of support and funding to those areas and developing relationships with additional potential partners in the watershed.
- Strategizing how to maintain current high levels of support from states and federal agencies.
- Addressing how UMRR will adapt to climate influences.

Introduction

The Upper Mississippi River System (UMRS) region has a rich tradition of interagency and interdisciplinary partnership dating back to the 1982 Upper Mississippi River Basin Commission's Master Plan. The Upper Mississippi River Restoration (UMRR) Coordinating Committee is a system-level forum for partners to discuss and consider program and budget priorities and issues regarding habitat restoration, scientific research, and monitoring. UMRR also has coordinating groups for partners to discuss technical implementation issues related to HREPs and long term resource monitoring. In addition, UMRR partners, including non-governmental entities, connect and integrate habitat restoration and knowledge-building with related programs and projects throughout the basin.

In summer 2021, the UMRR Coordinating Committee requested an interim review of the 2015-2025 UMRR Strategic and Operational Plan by the broad program partnership. This serves as a valuable check-in on the progress UMRR has made in achieving the goals and objectives of the Strategic and Operational Plan as well as affords the partnership an opportunity to prioritize activities through 2025.

In fall 2021, the UMRR Coordinating Committee employed a survey seeking input from a broad group of UMRR partners. Respondents were asked to evaluate UMRR's implementation in 2015-2020 based on the goals and objectives outlined in the 2015-2025 UMRR Strategic Plan. The survey had five sections with one section for each goal listed below and one section related to respondents' involvement with UMRR.

Goal 1 — Enhance habitat for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem.

Goal 2 — Advance knowledge for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem.

Goal 3 — Engage and collaborate with other organizations and individuals to help accomplish the Upper Mississippi River Restoration vision.

Goal 4 —Utilize a strong, integrated partnership to accomplish the Upper Mississippi River Restoration vision.

Materials, Methods, and Participants

Questionnaire Development

In May 2020, the UMRR Coordinating Committee agreed to employ a midpoint review of the 2015-2025 UMRR Strategic and Operational Plan. A survey was selected as means to inform how UMRR has progressed on the various goals and objectives contained within the Strategic and Operational Plan. The UMRR Coordinating Committee named the priority actions included in this broad partnership survey. While many of the Coordinating Committee's suggestions directly align with actions identified in the Strategic and Operational Plan, some may relate to multiple goals and objectives.

Success criteria identified in the Strategic Plan were modified into a series of statements for which levels of disagreement or agreement could be assessed by the broad UMRR partnership. Participants assessed each statement on a five-point scale: *Strongly disagree, Disagree, Neither disagree nor agree, Agree, Strongly agree*. All questions included a *Prefer not to respond* response option. Likert-type questions included *Unsure* and *Prefer Not to Respond* response options.

The complete survey and responses can be found in Appendix A. Open-ended responses are included in Appendix B.

Respondents

The survey was distributed to 200 individuals representing all implementing partner agencies and organizations and both elements of the UMRR program (i.e., habitat rehabilitation and enhancement projects and long term resource monitoring), including:

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- The five Upper Mississippi River states of Illinois, Iowa, Minnesota, Missouri, and Wisconsin
- U.S. Department of Agriculture – Natural Resource Conservation Service
- U.S. Environmental Protection Agency
- Conservation nonprofit organizations that actively engage in UMRR's implementation

Email invitation and reminders

Initial email invitations were sent on September 14, 2021 to 200 potential respondents to complete the questionnaire via an online polling service or Word document. On September 20, 2021 and October 12, 2021, reminder emails were sent to all potential respondents who had not yet responded. [Note: Difficulties with some email services flagging messages as spam or invitees being unable to access the online survey may have reduced the number of responses.]

Analysis

Respondents were not required to answer every question. Therefore, total number of responses differ between questions. The data presented in this report represent percentages of responses. For questions related to success criteria, participants assessed statements on a five-point scale: '*Strongly Disagree*,' '*Disagree*,' '*Neither Disagree nor Agree*,' '*Agree*,' '*Strongly Agree*.' Participants could also select '*Unsure*' or '*Prefer Not to Respond*.' Null responses (e.g., *Prefer not to respond*) were removed from the analysis presented in the figures and text, but are included in the results in Appendix A. There were no success criteria directly related to Goal 3 of the Strategic and Operational Plan. For questions related to priority actions, responses of "*Not a priority at all*" and "*Low priority*" are combined in this analysis as well as results of "*high priority*" and "*highest priority*." Null responses (e.g., *Unsure*, *Prefer not to respond*) were removed from the analysis presented in the figures and text, but are included in the results in Appendix A.

Results

Demographics

Responses were received from at least eight organizations in the UMRR partnership with the most responses from state agencies (39.7%), USACE (27.6%), and USGS (12.1%). Participants primarily working within Pools 1-13 had the greatest representation (74.1%), but each floodplain reach had at least one-quarter of respondents indicate it was in their predominant area of work. Over 80 percent of respondents have been involved with UMRR for over five years, with many respondents (41.4%) having been involved with the program for more than 10 years. The most common UMRR activities in which respondents have participated included: science meetings (63.8%), district-based river team meetings (58.6%), HREP project development teams (51.7%), and the 2019 UMRR HREP Planning and Design Workshop (50.0%). Over one-half of respondents indicated that they work on the HREP element and fully (31.0%) or marginally (24.1%) understand the LTRM element. Just under one-third of respondents work in the LTRM element and fully (8.6%) or marginally (20.7%) understand the HREP element. Over one-half of respondents indicated that they were moderately (41.4%) or very (13.8%) familiar with the 2015-2025 UMRR Strategic Plan and Operational Plan.

Program Success

Criteria for evaluating success in achieving the 2015-2025 UMRR Strategic and Operational Plan are as follows:

1. Restoration projects that enhance the health and resilience of the Upper Mississippi River and demonstrate progress in achieving this Strategic Plan's goals and objectives.
2. A highly integrated program in which research and monitoring informs restoration and management efforts and in which restoration efforts are readily available for scientific use.
3. The ability to detect and communicate the status and trends of the Upper Mississippi River as related to indicators of ecosystem health and resilience as well as management objectives.
4. A highly engaged regional partnership that is supportive of the program and its outputs.
5. The Upper Mississippi River Restoration is recognized as a premier program in large river restoration and science and is a source of guidance for similar programs nationally and internationally.

In the survey, these success criteria were modified into a series of statements for which levels of disagreement or agreement could be assessed by the broad UMRR partnership. Participants assessed each statement on a five-point scale: '*Strongly Disagree*,' '*Disagree*,' '*Neither Disagree nor Agree*,' '*Agree*,' '*Strongly Agree*.' Participants could also select '*Unsure*' or '*Prefer Not to Respond*.' Null responses (e.g., *Prefer not to respond*) were removed from the analysis presented in the figures and text of this section, but are included in the percentages shown in Appendix A. There were no success criteria directly related to Goal 3 of the Strategic and Operational Plan.

Goal 1: Enhance habitat for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem

Most respondents (85%) agreed that HREPs enhance the health and resilience of the Upper Mississippi River and provide opportunities for scientific research (89%) (Figure 1). However, respondents also noted that HREPs are a piece of a larger, more complicated system and may not necessarily be able to address certain drivers of change, such as watershed influences to the system.

> *"UMRR provides great opportunities for expanding and rehabilitating habitat for preferred fishes and wildlife, but does not address the actual causes of habitat degradation, like impacted watershed hydrology."*

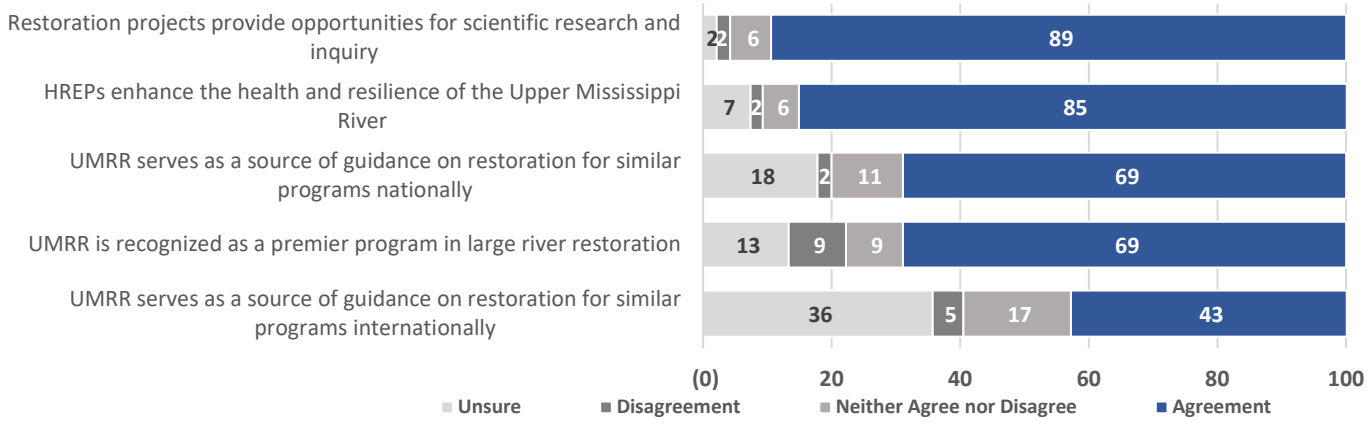

FIGURE 1. Evaluation of UMRR program health and resilience. Numbers indicate percentage of responses.

While most respondents believe UMRR is a premier large river restoration program (69%) and national example for habitat restoration (69%), many respondents were unsure (36%) how well the program is known internationally. One respondent noted that there may be greater awareness of the LTRM element of UMRR than the HREP element. Others suggested that presentations at international or national conferences, such as the American Fisheries Society, as well as increased interaction with the academic community could help raise awareness of UMRR. Another suggestion was to empower biologists and managers to talk about the program to their inland or regional counterparts with an emphasis on the value of resource managers and biologists to successful projects.

> *"My perception is there is greater awareness of the LTRM component than HREPs. Predominantly because of peer reviewed publication of the LTRM research and monitoring and presentations at professional conferences. However, it is much more challenging to get peer review publication of each individual HREPs performance and/or the science and data that goes into the project design."*

Goal 2: Advance knowledge for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem

Approximately, four out of five respondents agreed that research and monitoring inform restoration and management (84%) (Figure 2). One respondent specifically noted the essential nature of topobathy data for HREP planning and design.

> *"LTRM monitoring, and especially landcover/bathymetry data, are fundamental to the planning and design of HREPS, but importantly also provide an ongoing description of the basic condition of the river, the understanding of which is central to selecting/planning future HREPs"*

Those who disagreed with the statement noted that, while LTRM monitoring may inform restoration at a broad scale, its application to specific HREPs is limited to those in trend pools and that other considerations, such as administrative policies or agency priorities, may be more important when sequencing HREPs.

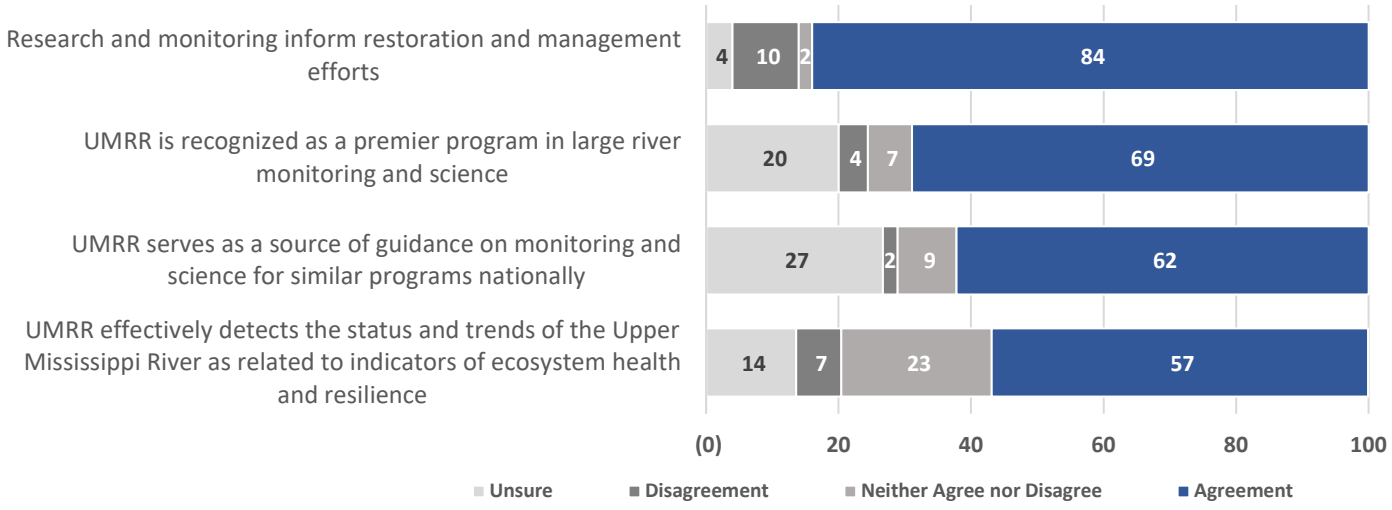

FIGURE 2. Evaluation of UMRR program monitoring and science. Numbers indicate percentage of responses.

Most UMRR partners (57%) think UMRR effectively detects trends of the UMRS as related to ecosystem health and resilience while only 43% (Figure 3) believe it does so related to restoration and management. Folks that disagreed noted that the scale of status and trends monitoring may not accurately capture restoration work.

> *"For example, it does not appear that physical features of many HREPs are included because the as-built elements (i.e., dredge cuts or emergent marsh) are not updated in the bathymetry and LIDAR."*

Respondents agreed that UMRR is recognized nationally as a premier program and leader in the science and monitoring of large rivers (62%) but were unsure of its international standing (32%) (Figure 3). As examples of this, one respondent indicated that LTRM personnel are frequently invited to present the results of the program's monitoring in regional, national, and international venues and are also consulted by others working to start or modify river monitoring programs. Multiple exchanges with scientists in China are the clearest example of past international efforts, but it is unclear how much of those activities are still occurring.

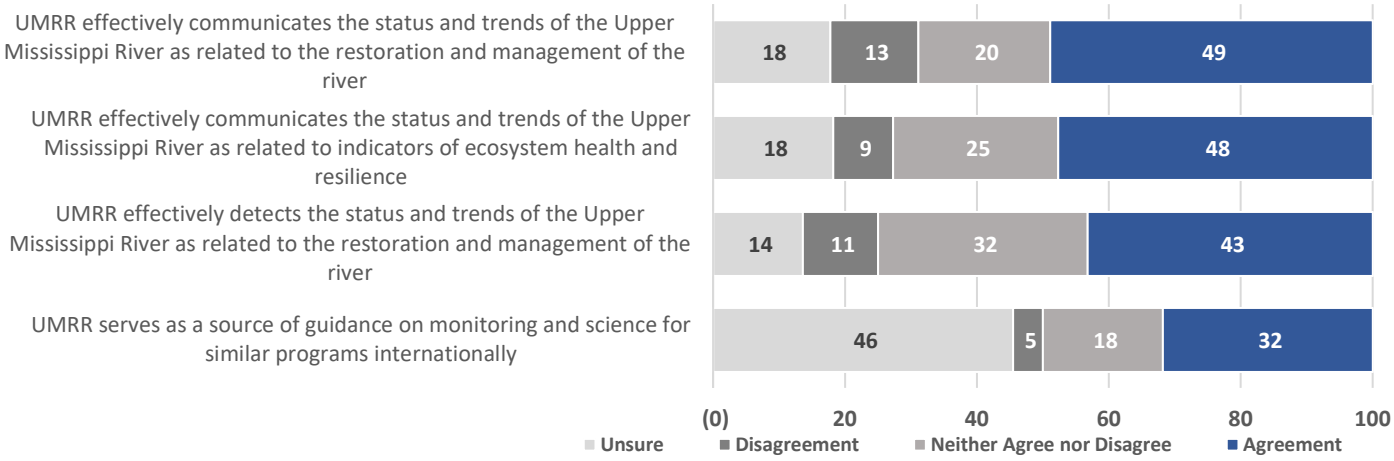

FIGURE 3. Evaluation of UMRR program detection and communication efficacy. Numbers indicate percentage of responses.

Approximately 48% to 49% of respondents believe that the partnership effectively communicates status and trends of the UMRS. This is accomplished by means of fact sheets, presentations at various partnership venues, publications, and conversations among UMRR partners. Respondents anticipated the forthcoming ecological status and trends report as an important component of future communication.

Goal 4: Utilize a strong, integrated partnership to accomplish the Upper Mississippi River Restoration vision

Most partners feel that UMRR has a highly engaged regional partnership (79%) that is supportive of the program and its outputs (80%) (Figure 4). However, notable opportunities to strengthen the partnership and support of the program exist. These include updating project sponsorship agreements to increase partners ability to serve as project sponsors and ensuring the new project planning process leaves adequate time for collection and understanding of new data. One respondent noted increased workload demands affect partners ability to fully engage and that additional appropriations may further exacerbate capacity issues.

> *"…we need deeper engagement from partners in discussions. While there is desire to be engaged, too often people are forced to attend meetings not fully prepared due to workload demands. We need to message that to agency leadership to gain support for staffing, and we need to figure out how to transfer federal funds routinely to the states in support of the program. With increased appropriations, we will exceed our capabilities without additional capacity funding to the states."*

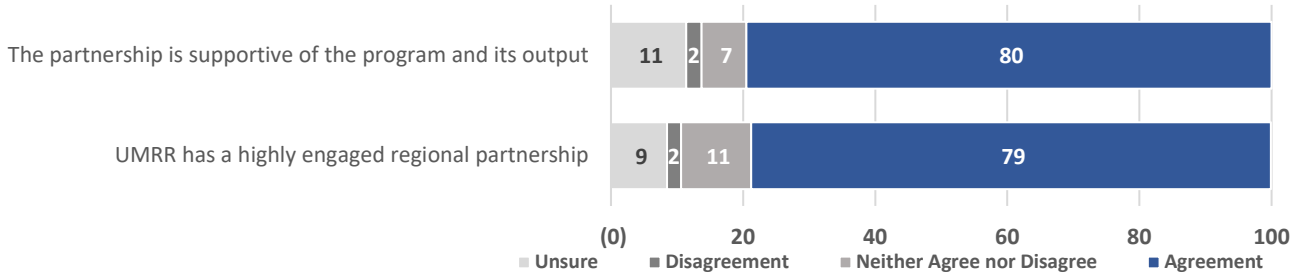

FIGURE 4. Evaluation to UMRR partnership. Numbers indicate percentage of responses.

Priority Actions

Goal 1: Enhance habitat for restoring and maintaining a healthier and more resilient UMRS ecosystem

Objective 1.1 **Address key ecological needs at various spatial scales through habitat projects that reflect best available knowledge and advance UMRR's vision**

Strategy 1 Identify and select habitat projects that will most effectively and efficiently advance UMRR's vision,
Strategy 2 Plan, design, and construct habitat projects to best, and most efficiently, address their defined objectives and advance the UMRR's vision, using structural and non-structural measures and considering ecological benefits at various spatial scales

Strategy 3 Perform operation and maintenance on UMRR's habitat projects to ensure key features are working properly and effectively advancing the projects' goals and UMRR's vision

Objective 1.2 **Apply adaptive management principles to address risk and uncertainty and continually enhance restoration and knowledge of the Upper Mississippi River ecosystem**

Strategy 1 Refine and implement a framework to operationalize UMRR's adaptive management efforts, including when and how to apply certain adaptive management techniques and documenting, communicating, and integrating the results and conclusions

Strategy 2 Apply monitoring and adaptive management principles to set learning objectives (for select projects), adjust project designs based on ecological models, evaluate the ecological responses to project features, modify constructed project features if not performing as intended or to enhance effectiveness, assess operation and maintenance activities, and enhance future restoration efforts

Strategy 3 Employ deliberate and explicit adaptive management analyses (hypothesis testing) using selected habitat projects to explore priority science questions or learning objectives and evaluate the effects of UMRR's restoration efforts on the Upper Mississippi River ecosystem's health and resilience

Strategy 4 Communicate and integrate learned information into future restoration alternatives and scientific investigations to guide and optimize UMRR's investment in enhancing restoration and knowledge of the Upper Mississippi River ecosystem

Priority actions to support Goal 1 of the Strategic Plan

The highest priority actions identified by survey respondents to support Goal 1 were related to HREP monitoring and evaluation. Most respondents indicated four actions to be of high or highest priority (Figure 5):

- Centralize HREP data and collect and digitize historic data currently stored in computers and file cabinets (66%)
- Establish consistent and standardized HREP monitoring (66%)
- Complete HREP project evaluation reports (PERs) across districts (59%)
- Define appropriate temporal and spatial scales for determining physical and biotic response of habitat project objectives (56%)

Survey respondents stated that centralizing HREP data would benefit current project planning efforts. Those who indicated that this effort is not a priority explained that digitizing historic data would require a significant effort and that centralizing currently collected data is a higher priority. Participants who prioritized consistent and standardized HREP monitoring said it would substantially increase the value of pre- and post-construction monitoring data by easing the compilation and serving of data, thereby improving data availability for adaptive management implementation as well as application in future project planning and design. PERs serve as records of project performance, and as such are an important document for informing future projects. However, respondents expressed concern that completing PERs has been of low priority and is complicated by inconsistencies across Corps' Districts and agencies in monitoring, evaluating, and reporting. Timely completion of PERs could provide meaningful data for PDTs in the development of alternatives or calculation of habitat units for cost effectiveness and incremental cost analysis (CEICA) and improve estimates of operation and maintenance (O&M) costs of project features. Respondents identified that defining appropriate temporal and spatial scales of habitat project objectives would allow the program to better answer questions about project success, measure and communicate impacts of projects at the system scale, and inform adaptive management needs.

> *"Evaluating projects and providing summary reports in a timely fashion pre- and post-construction allows us to make any necessary informed design modifications and/or implement adaptive management strategies in a timely fashion. Further, it helps to inform the development of future projects based on what has been successful and lessons learned."*

Many respondents indicated that creating ecosystem models (e.g., floodplain forest succession) (45%) and additional Habitat Suitability Index (HSI) models (e.g., diving duck, gray squirrel) (45%) were of high or highest priority. Respondents stressed the need for additional model development to assess benefits of HREPs accurately, noting that current models can be ineffective and do not include species important to riverine faunal groups.

> *"Placing a priority on developing ecosystem models will not only inform future scenarios (alternatives with/without project), but the results can be applied to development or refinement of the HSI models. We need to better tie the HSI models to our desired outcomes."*

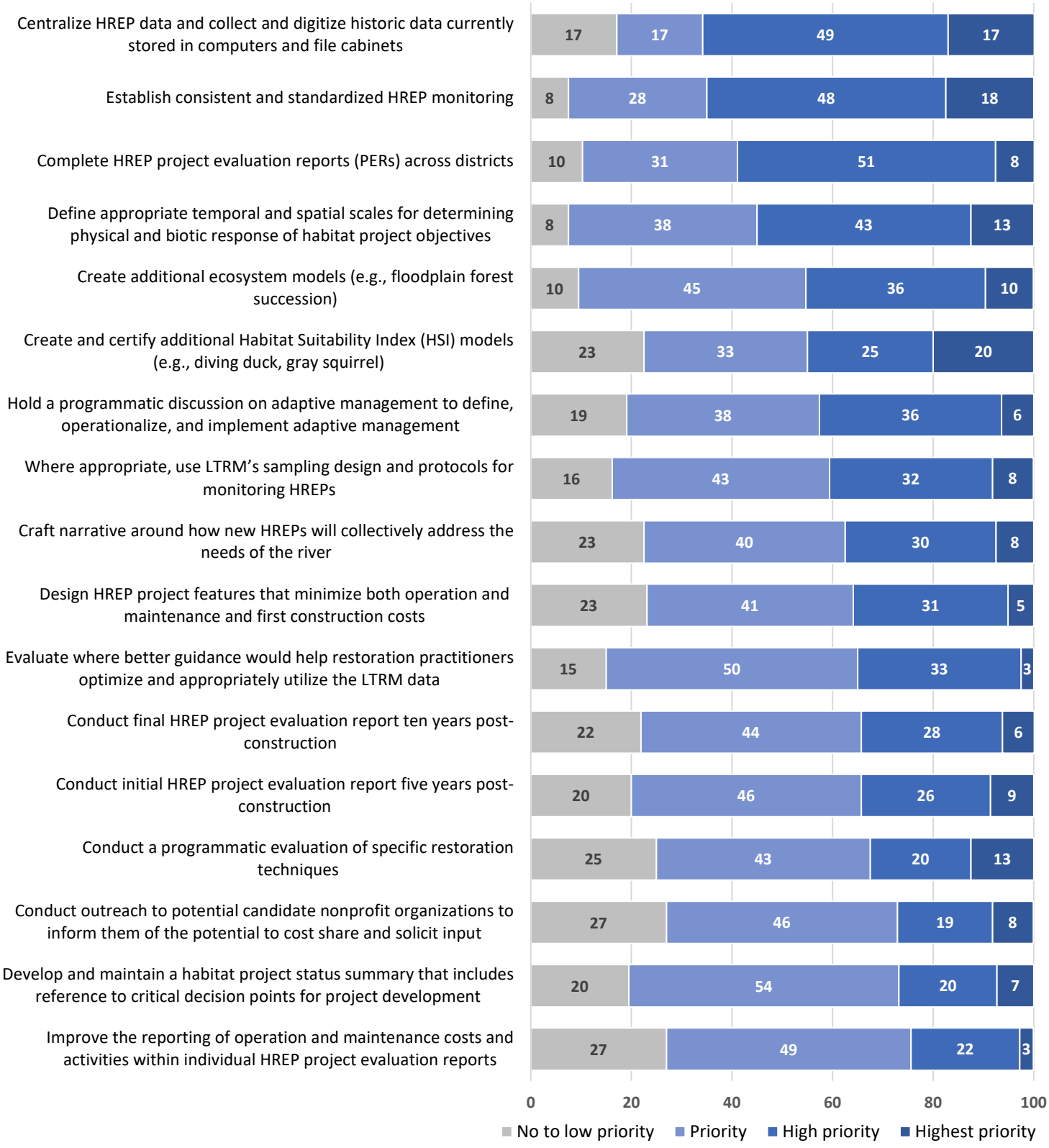

FIGURE 5. Evaluation of priorities among actions presented in the survey to support Goal 1 of the strategic plan. Numbers indicate percentage of total responses not including null responses.

Holding a programmatic discussion on adaptive management to define, operationalize, and implement adaptive management was also of high priority (44%) for many respondents. Reasons provided for prioritizing adaptive management discussions across the program were to create a common definition, goals, and implementation approach for adaptive management. The program's longevity allows for applying lessons learned from past HREPs to future projects, but it was also noted that some early HREPs are now degrading, and adaptive solutions are not being addressed because of a lack of adaptive management implementation.

The actions indicated as no or low priority by a quarter or more of respondents were programmatic evaluation of specific restoration techniques (25%), outreach to potential candidate nonprofit organizations to inform them of the potential to cost share and solicit input (27%), and improving the reporting of O&M costs and activities within individual HREP project evaluation reports (27%). One respondent suggested a programmatic evaluation focused instead on how various HREP objectives are met via implementation of different project features.

> *"Ecosystem restoration requires a diverse mix of tools appropriate for the desired objectives of a project at a given location on the river. A better approach would be to prepare a UMRR handbook similar to the HREP design handbook, but have its focus be on the various HREP objectives and describe how different projects implemented features to achieve the physical and chemical criteria of an objective."*

Goal 2: Advance knowledge for restoring and maintaining a healthier and more resilient UMRS ecosystem

Objective 2.1	**Assess, and detect changes in, the fundamental health and resilience of the Upper Mississippi River ecosystem by continuing to monitor and evaluate its key ecological components of aquatic vegetation, bathymetry, fish, land use/ land cover, and water quality**
Strategy 1	Evaluate the Upper Mississippi River's ecological status and trends through comprehensive, integrated analyses of key ecological indicators using UMRR's long term data
Strategy 2	Conduct scientific analysis, research, and modeling using UMRR's long term data, and any necessary supplemental data, to gain knowledge about the Upper Mississippi River ecosystem status and trends and process, function, structure, and composition
Strategy 3	Continue to improve the effectiveness of long term data collection, analysis, storage, and dissemination to maintain the data's integrity, long-term consistency, relevance, and usability
Strategy 4	Evaluate additional ecological components as priorities and resources allow to gain an even broader understanding of the Upper Mississippi River ecosystem and expand possibilities for important scientific analyses
Objective 2.2	**Provide critical insights and understanding regarding a range of key ecological questions through a combination of monitoring, additional research, and modeling in order to inform and improve management and restoration of the Upper Mississippi River ecosystem**
Strategy 1	Conduct focused research and analyses to gain critical, management-relevant information about the Upper Mississippi River ecosystem's process, function, structure, and composition as well as the dynamics and interactions among system components
Strategy 2	Conduct research projects that improve our understanding of critical ecological conditions and processes by examining the effects of select habitat restoration projects on those conditions and processes

Strategy 3	Utilize other information, as needed, to augment UMRR's long term data sets for comprehensive analyses of the river's health and resilience
Strategy 4	Develop and improve ecological models and other decision support tools to enhance science capabilities and understandings, and improve understanding of the potential effects of future management actions
Strategy 5	Effectively communicate to habitat project planners and managers regarding how research findings may be applied to habitat projects

Priority actions to support Goal 2 of the Strategic Plan

All actions under Goal 2 had broad support as priority actions (Figure 6). Most survey respondents identified connecting resilience concepts with ongoing and future restoration work as a high priority (54%) and many respondents supported efforts to connect outputs from the LTRM ecological status and trends report, HNA-II, and the resilience assessment (43%). Respondents noted that a focus on resilience is especially important in light of climate change and ongoing changes to the dynamic environment. A suggestion for further connecting resilience with restoration work was to develop a structured approach to incorporate resilience concepts into project selection. One proposed approach was to integrate resilience concepts and drivers with HREP design criteria.

> *"This also needs… a finer resolution step that includes what specific combination of resiliency concepts/drivers are needed to achieve habitat for species/ guilds/major resources so that the engineers can cross-walk HREP design criteria to the resilience controlling variables."*

> *"Resilience is key with regards to a changing system… Climate change is only exacerbating that issue and furthering the need to focus on resilience."*

> *"…there remains some lack of clarity around resilience and how to integrate resiliency concepts into on-the-ground restoration and resource management within the authority of the UMRR program."*

Many respondents identified support for reviewing the accessibility and usability of scientific data as well as learning sessions focused on accessing and utilizing LTRM data.

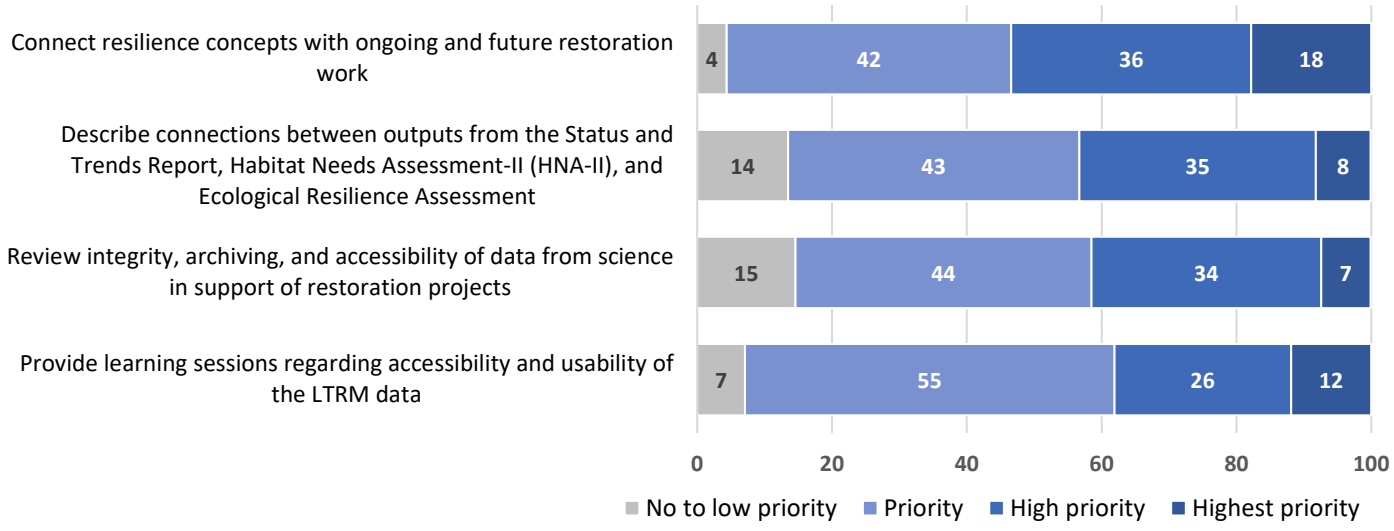

FIGURE 6. Evaluation of priorities among actions presented in the survey to support Goal 2 of the strategic plan. Numbers indicate percentage of total responses not including null responses.

Goal 3: Engage and collaborate with other organizations and individuals to help accomplish the UMRR vision

Objective 3.1	**Work with key organizations and individuals in the Upper Mississippi River watershed**
Strategy 1	Ensure rich collaboration with key organizations and individuals in the Upper Mississippi River watershed in advancing complementary visions, missions, and goals
Strategy 2	With key watershed programs and projects, jointly develop and communicate common messages about the restoration and knowledge needs of the Upper Mississippi River
Strategy 3	Seek knowledge from other organizations and individuals for the purposes of being aware of activities that may influence UMRR's work and enhancing programmatic efforts
Strategy 4	Directly engage relevant organizations or individuals in implementing UMRR's efforts, as appropriate
Objective 3.2	**Provide information to organizations and individuals whose actions and decisions affect the Upper Mississippi River ecosystem**
Strategy 1	Enhance the delivery and utility of UMRR's knowledge in order to increase understanding of the Upper Mississippi River's ecosystem drivers and means to achieve the UMRR vision
Strategy 2	Provide decision makers with timely, relevant, understandable, and usable knowledge about the needs and tools available to advance the UMRR's vision
Objective 3.3	**Exchange knowledge with other organizations and individuals nationally and internationally**
Strategy 1	Serve as a resource for similar programs nationally and internationally
Strategy 2	Seek knowledge from other organizations and individuals nationally and internationally to enhance UMRR's efforts in advancing its vision

Priority actions to support Goal 3 of the Strategic Plan

The highest priorities identified by survey respondents to support collaboration with others included connecting with people in the watershed through targeted communication at the pool and Congressional district scale (Figure 7). The highest priorities identified were to "link together habitat restoration projects with existing watershed projects and upstream contributors (50%) and "finalize the UMRR communications and outreach plan (43%)."

> *"Connecting, enhancing, and working mutually with watershed efforts in any way should be a priority. Strengthening or influencing restoration efforts in the watershed will improve what is flowing to us (the mainstem UMR)."*

One respondent noted that securing participation from watershed groups early in the outreach process would improve outcomes.

> *"If you desire outside participation and support, may need to secure upfront participation in development of scope and plan."*

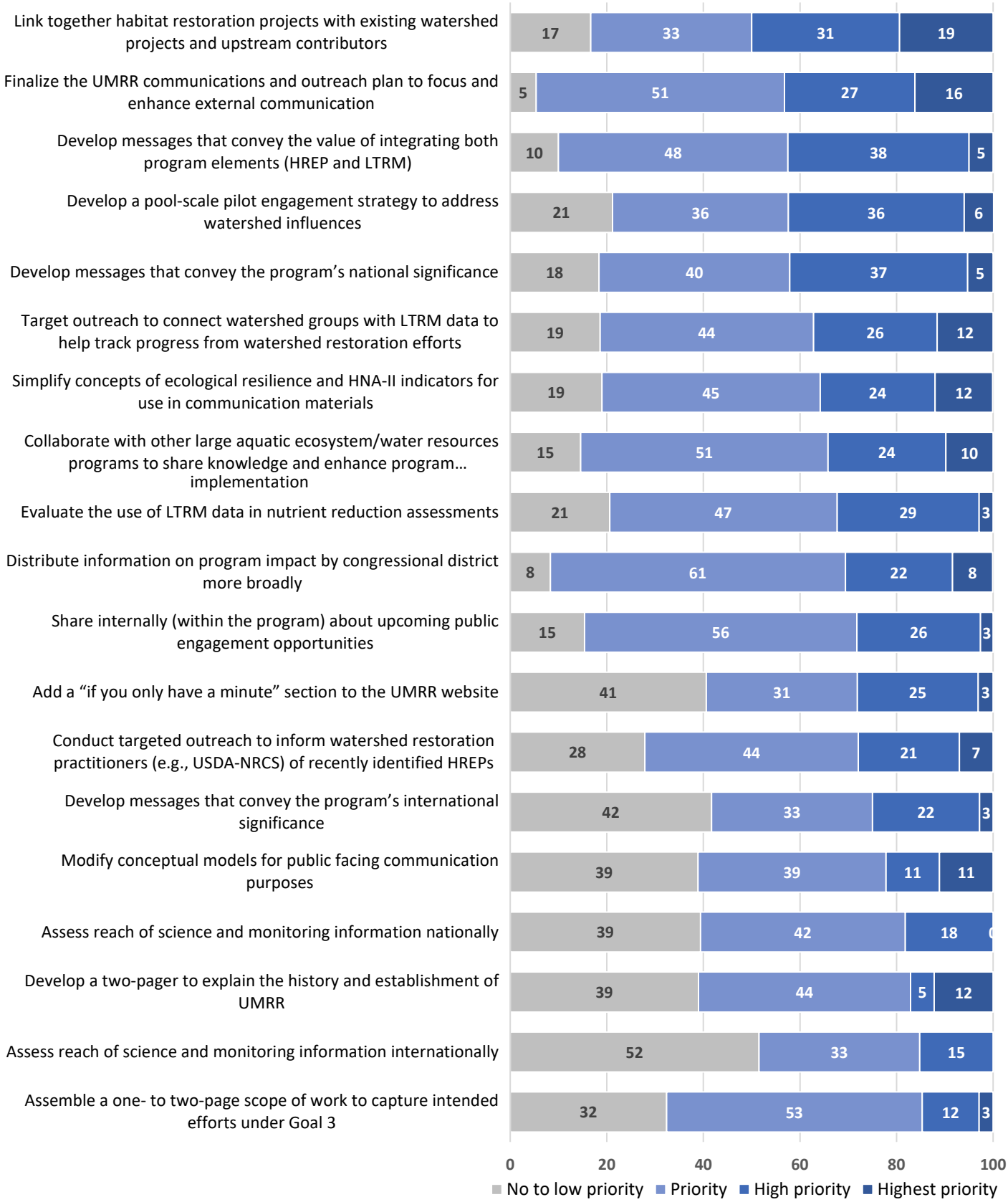

FIGURE 7. Evaluation of priorities among actions presented in the survey to support Goal 3 of the strategic plan. Numbers indicate percentage of total responses not including null responses.

The lowest priority actions identified as low to no priority were assessing UMRR's international reach of science and monitoring information (52%) and developing messages to convey UMRR's international significance (42%). Adding an "if you only have a minute" section to the UMRR website (41%) was also indicated as low to no priority by many respondents. Respondents noted that messages to the public must include information that resonates with them:

> *"Messaging needs to continue to include metrics that average folks can comprehend and appreciate, not just scientific measures or habitat unit increase, like increased angler/hunter usage and harvest, O&M (or any other public-born cost) cost savings resulting from the project, jobs supported/local revenue during construction and from increased usage."*

Goal 4: Utilize a strong, integrated partnership to accomplish the UMRR vision

Objective 4.1	**Promote a common vision and sense of purpose, transparency, and accountability among UMRR partners**
Strategy 1	Partners carry a strong, unified message regarding UMRR's value, accomplishments, and importance to the region and nation
Strategy 2	Partners work in collaboration to enhance restoration and knowledge of the Upper Mississippi River to advance UMRR's vision
Strategy 3	Continually learn and improve as a program and in implementing restoration and science techniques
Strategy 4	Improve transparency and accountability within the partnership regarding program priorities and budgets
Strategy 5	Organize and maintain institutional knowledge of UMRR's policy and programmatic efforts
Objective 4.2	**Implement the UMRR as outlined in the program's adopted Joint Charter for the UMRR Coordinating Committee, Analysis Team, and Habitat Planning and Sequencing Framework Teams, as well as the FY 2015-2025 UMRR Strategic Plan**
Strategy 1	Partner agencies implement program activities in accordance to the adopted Joint Charter
Strategy 2	Partner agencies collaboratively develop and implement the strategic plan

Priority actions to support Goal 4 of the Strategic Plan

The highest priority identified by survey respondents to support Goal 4 was to develop a narrative around existing policies resulting in missed restoration opportunities (57%) (Figure 8). Multiple participants noted barriers to restoration opportunities, and one proposed annual reporting of the lost economic and environmental benefits of those missed opportunities.

> *"Existing policies and requirements that prevent us from following through with HREPs that fit the restoration needs should be addressed as soon as possible. PPA requirements create major barriers but also Corps real estate requirements create barriers as well."*

> *"Any opportunities missed because of a policy should be reported in a specific section annually, along with projected economic and environmental lost benefits."*

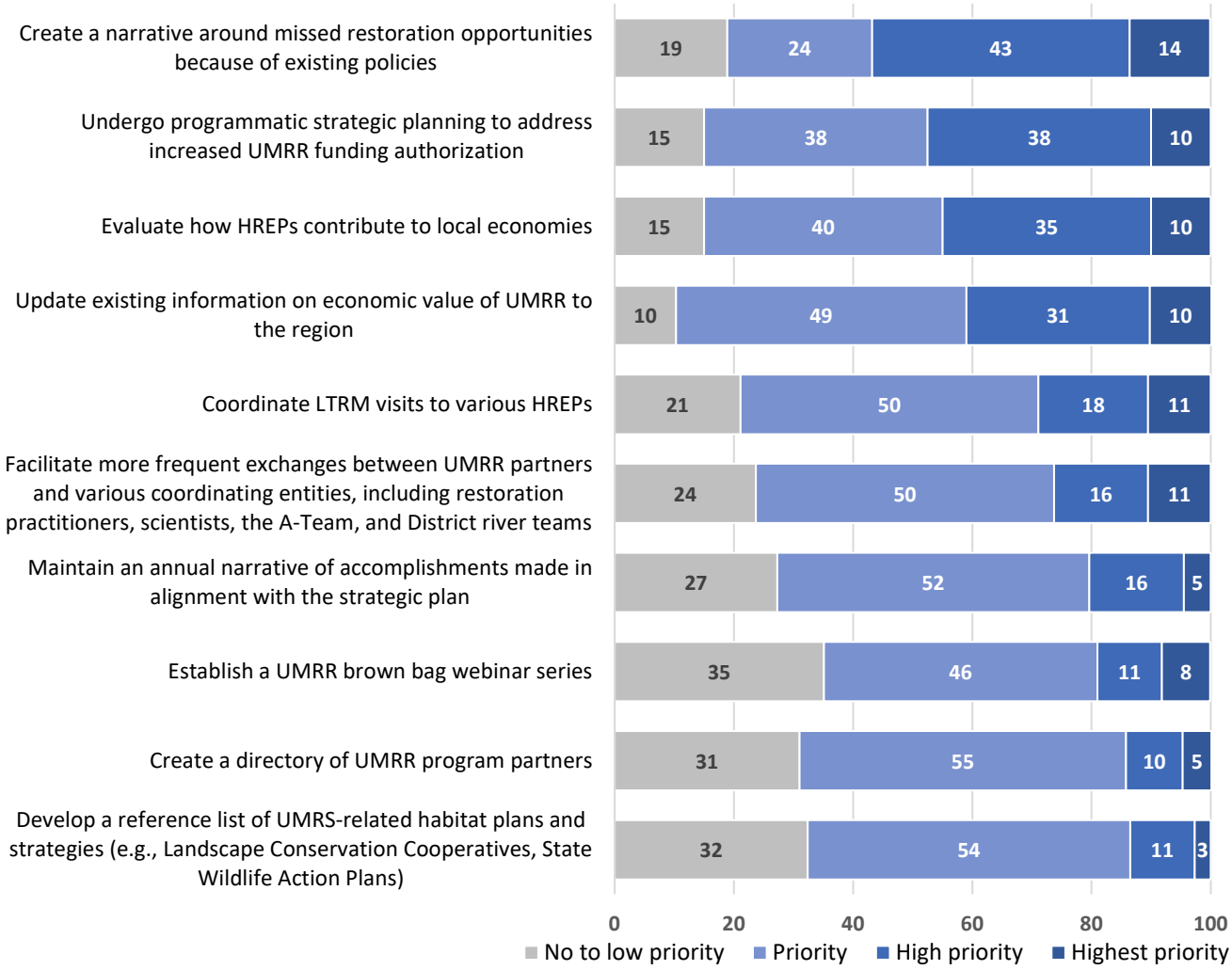

FIGURE 8. Evaluation of priorities among actions presented in the survey to support Goal 4 of the strategic plan.

Numbers indicate percentage of total responses not including null responses.
Many respondents also prioritized efforts to address the increased UMRR funding authorization through strategic planning (48%) and evaluate HREP contributions to local economies (45%). Those in favor of assessing HREP contributions to local economies suggested it could increase public support for the program and provide a conduit for more public involvement in the program. However, others raised concerns over an economic impact analysis of HREPs as it could take away from the focus on habitat restoration needs as the priority.

> *"Annual reporting and strategic planning are important to ensure continued or strengthened funding, but shouldn't get in the way of actual program delivery."*
>
> *"Economy and economics should not play into our decision making. We should restore habitats unrelated to the economic or recreational value."*
>
> *"Evaluating the economics of HREPs and how much they really contribute the local economy is needed. Popular HREPs (e.g. Stoddard, Lake Onalaska) have likely paid for themselves many times over. The program needs to poll the public regarding the types of projects they would like to see more often."*

The lowest priority actions were the development of a UMRR brown bag series (35%) and reference list of UMRS-related habitat plans and strategies (32%). Respondents favored focus on developing habitat plans specific to the river as a partnership and in-person connections across UMRR elements over webinars.

> *"We need to develop partnership goals and objectives for the subsystems and major resources that focus on the Rivers. These other plans provide some overview for river management, but what is missing is a partnership plan for the river that includes habitats and biotic communities."*
>
> *"Brown bag seminars would be valuable, but I feel that they may not pay the dividends sought. Investing in face-to-face interactions between HREP and LTRM practitioners will provide more valuable benefit in the form of expanded networks and hands-on learning at HREP visits or science discussion."*

Comments and Suggestions Beyond the Scope of the Survey

Respondents suggested additional items for the UMRR Coordinating Committee to discuss in conjunction with setting priorities following the review of the strategic and operational plan. Programmatic items included:

- Resolving disparities amongst agency priorities and missions,
- Adequately resourcing programmatic communication efforts,
- Better conveying the importance of science to the program, and
- Efficiently completing after action reviews to inform future project planning.

Other items focused more externally such as:

- Addressing tributary and watershed issues to improve river ecosystem conditions by expanding the scope of support and funding to those areas and developing relationships with additional potential partners in the watershed,
- Strategizing how to maintain current high levels of support from states and federal agencies, and
- Addressing how UMRR will adapt to climate influences.

Appendix A. UMRR Strategic Plan Partnership Survey

UMRR 2015-2025 Strategic Plan Review

In this survey of the UMRR partnership, you will be asked to evaluate how well UMRR has implemented actions and addressed needs outlined in the 2015-2025 UMRR Strategic Plan. Your responses will help to evaluate the success of strategic plan implementation over the last five years and to prioritize actions for UMRR to implement over the next five years.

The survey has five sections, including information about your involvement with UMRR to assess representativeness of survey respondents to program partners overall and a section related to each of the four goals outlined in the Strategic Plan:

- Goal 1 — Enhance habitat for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem.
- Goal 2 — Advance knowledge for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem.
- Goal 3 — Engage and collaborate with other organizations and individuals to help accomplish the Upper Mississippi River Restoration vision.
- Goal 4 — Utilize a strong, integrated partnership to accomplish the Upper Mississippi River Restoration vision.

The survey results will be summarized in the aggregate, excluding references to any individual responses. We ask that you complete the survey to the best of your ability, but you may skip any question that you prefer to not answer.

The survey is expected to take approximately 30-45 minutes to complete.

Please contact Andrew Stephenson via email at astephenson@umrba.org if you have any questions or difficulty responding to the survey.

[Respondents were not required to answer every question or were able to select multiple responses , therefore total number of responses may differ between questions.]

Demographics

Q1. Which of the following best describes your agency?

- ○ USACE [27.6%]
- ○ USFWS [6.9%]
- ○ USGS [12.1%]
- ○ US EPA [3.4%]
- ○ USDA NRCS [1.7%]
- ○ State Agency [39.7%]
- ○ NGO [3.4%]
- ○ Prefer not to respond [3.4%]
- ○ Other _____ [1.7%]

Q2. In which floodplain reaches do you predominantly work? [select all that apply]

- ☐ Upper Impounded Reach (Pool 1-13) [74.1%]
- ☐ Lower Impounded Reach (Pool 14-26) [43.1%]
- ☐ Open River Reach (LD26- Mississippi-Ohio River Confluence) [25.9%]
- ☐ Illinois River Reach [25.9%]

- ☐ Prefer not to respond [3.4%]

Q3. Approximately, how long have you been involved with UMRR in any capacity?

- ○ Less than 1 year [5.2%]
- ○ 1-3 years [12.1%]
- ○ 3-5 years [15.5%]
- ○ 5-10 years [25.9%]
- ○ More than 10 years [41.4%]
- ○ Prefer not to respond []

Q4. During the last 3 years, in which of the following UMRR-related activities have you participated [select all that apply]:

- ☐ UMRR Coordinating Committee Member or Alternate [13.8%]
- ☐ UMRR Coordinating Committee Quarterly Meeting [41.4%]
- ☐ A-Team meetings [37.9%]
- ☐ Communications and Outreach Team meetings [24.1%]
- ☐ District River Teams' meetings (e.g., FWWG/RRF, FWIC/RRCT, RRAT-tech/RRAT-exec) [58.6%]
- ☐ 2019 HREP Planning and Design Workshop [50.0%]
- ☐ LTRM component meetings (e.g., 2017, 2019, 2021) [37.9%]
- ☐ Science meetings (e.g., 2018, 2020) [63.8%]
- ☐ LTRM activities (e.g., field work, data analysis) [41.4%]
- ☐ Next Generation HREP Selection Process (2019-2020) [43.1%]
- ☐ An HREP Project Development Team (PDT) [51.7%]
- ☐ Other _____

Q5. Which of the following statements best describes your involvement with and understanding of the HREP and LTRM elements of UMRR?

- ○ I work in the **HREP** element and I fully understand what the **LTRM** element does. [31.0%]
- ○ I work in the **HREP** element and I marginally understand what the **LTRM** element does. [24.1%]
- ○ I work in the **HREP** element and I do not understand what the **LTRM** element does. [3.4%]
- ○ I work in the **LTRM** element and I fully understand what the **HREP** element does. [8.6%]
- ○ I work in the **LTRM** element and I marginally understand what the **HREP** element does. [20.7%]
- ○ I work in the **LTRM** element and I do not understand what the **HREP** element does. [6.9%]
- ○ Prefer not to respond [3.4%]
- ○ Other _____ [6.9% - responses included crossing over both programs or not working in either element but having a marginal to good understand what both elements do.]

Q6. How familiar are you with the 2015-2025 UMRR Strategic Plan and Operational Plan?

- ○ Not at all familiar [6.9%]
- ○ Slightly familiar [36.2%]
- ○ Moderately familiar [41.4%]
- ○ Very familiar [13.8%]
- ○ Unsure [0.0%]
- ○ Prefer not to respond [1.7%]

Instructions

Questions that ask you to indicate your level of agreement or a level of priority may have multiple statements listed. Please be sure to provide a response for each statement listed.

Goal 1

The following questions relate to Goal 1 – "Enhance habitat for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem."

Q7. Please indicate your level of agreement or disagreement with each of the following statements

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree	Unsure	Prefer not to respond
A. HREPs enhance the health and resilience of the Upper Mississippi River	1.9%	0.0%	5.6%	33.3%	51.9%	7.4%	
B. Restoration projects provide opportunities for scientific research and inquiry	2.1%	0.0%	6.4%	51.1%	38.3%	2.1%	
C. UMRR is recognized as a premier program in large river restoration	2.2%	6.7%	8.9%	33.3%	35.6%	13.3%	
D. UMRR serves as a source of guidance on restoration for similar programs **nationally**	0.0%	2.2%	11.1%	55.6%	13.3%	17.8%	
E. UMRR serves as a source of guidance on restoration for similar programs **internationally**	0.0%	4.7%	16.3%	32.6%	9.3%	34.9%	

Q8. If you indicated disagree or strongly disagree for any of the items, please provide any additional context around your responses or examples relevant to this set of questions.

Q9. If you indicated agree or strongly agree for any of the items, provide any additional context around your responses or examples relevant to this set of questions.

Q10. Please indicate the level of priority you believe the program should place on each of the following actions in support of Goal 1 of the strategic plan.

	Not a priority	Low priority	Priority	High priority	Highest priority	Unsure	Prefer not to respond
A. Hold a programmatic discussion on adaptive management to define, operationalize, and implement adaptive management	3.9%	13.7%	35.3%	33.3%	5.9%	7.8%	
B. Define appropriate temporal and spatial scales for determining physical and biotic response of habitat project objectives	2.3%	4.5%	34.1%	38.6%	11.4%	9.1%	
C. Establish consistent and standardized HREP monitoring	0.0%	6.7%	24.4%	42.2%	15.6%	11.1%	
D. Where appropriate, use LTRM's sampling design and protocols for monitoring HREPs	0.0%	13.3%	35.6%	26.7%	6.7%	17.8%	
E. Centralize HREP data and collect and digitize historic data currently stored in computers and file cabinets	0.0%	15.9%	15.9%	45.5%	15.9%	6.8%	
F. Complete HREP project evaluation reports (PERs) across districts	0.0%	8.7%	26.1%	43.5%	6.5%	15.2%	
G. Craft narrative around how new HREPs will collectively address the needs of the river	0.0%	20.0%	35.6%	26.7%	6.7%	11.1%	
H. Create and certify additional Habitat Suitability Index (HSI) models (e.g., diving duck, gray squirrel)	2.2%	17.4%	28.3%	21.7%	17.4%	13.0%	
I. Create additional ecosystem models (e.g., floodplain forest succession)	2.2%	6.5%	41.3%	32.6%	8.7%	8.7%	
J. Conduct a programmatic evaluation of specific restoration techniques	6.5%	15.2%	37.0%	17.4%	10.9%	13.0%	
K. Evaluate where better guidance would help restoration practitioners optimize and appropriately utilize the LTRM data	0.0%	13.0%	43.5%	28.3%	2.2%	13.0%	
L. Conduct initial HREP project evaluation report five years post-construction	0.0%	15.6%	35.6%	20.0%	6.7%	20.0%	2.2
M. Conduct final HREP project evaluation report ten years post-construction	0.0%	15.9%	31.8%	20.5%	4.5%	25.0%	2.3

N. Conduct outreach to potential candidate nonprofit organizations to inform them of the potential to cost share and solicit input	4.3%	17.4%	37.0%	15.2%	6.5%	19.6%	
O. Improve the reporting of operation and maintenance costs and activities within individual HREP project evaluation reports	0.0%	21.7%	39.1%	17.4%	2.2%	19.6%	
P. Develop and maintain a habitat project status summary that includes reference to critical decision points for project development	4.3%	13.0%	47.8%	17.4%	6.5%	10.9%	
Q. Design HREP project features that minimize both operation and maintenance and first construction costs	2.2%	17.4%	34.8%	26.1%	4.3%	15.2%	

Q11. If you indicated not a priority or low priority for any of the items, please provide any additional context around your responses or examples relevant to this set of questions.

Q12. If you indicated priority, high priority, or highest priority for any of the items, provide any additional context around your responses or examples relevant to this set of questions.

[Continue on next page]

Goal 2

The following questions relate to Goal 2 – "Advance knowledge for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem."

Q13. Please indicate your level of agreement or disagreement with each of the following statements.

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree	Unsure	Prefer not to respond
A. Research and monitoring inform restoration and management efforts	4.0%	6.0%	2.0%	48.0%	36.0%	4.0%	
B. UMRR effectively detects the status and trends of the Upper Mississippi River as related to indicators of ecosystem health and resilience	0.0%	6.8%	22.7%	40.9%	15.9%	13.6%	
C. UMRR effectively detects the status and trends of the Upper Mississippi River as related to the restoration and management of the river	2.3%	9.1%	31.8%	38.6%	4.5%	13.6%	
D. UMRR effectively communicates the status and trends of the Upper Mississippi River as related to indicators of ecosystem health and resilience	0.0%	9.1%	25.0%	40.9%	6.8%	18.2%	
E. UMRR effectively communicates the status and trends of the Upper Mississippi River as related to the restoration and management of the river	4.4%	8.9%	20.0%	42.2%	6.7%	17.8%	
F. UMRR is recognized as a premier program in large river monitoring and science	0.0%	4.4%	6.7%	40.0%	28.9%	20.0%	
G. UMRR serves as a source of guidance on monitoring and science for similar programs **nationally**	0.0%	2.2%	8.9%	44.4%	17.8%	26.7%	
H. UMRR serves as a source of guidance on monitoring and science for similar programs **internationally**	0.0%	4.5%	18.2%	25.0%	6.8%	45.5%	

Q14. If you indicated disagree or strongly disagree for any of the items, please provide any additional context around your responses or examples relevant to this set of questions.

Q15. If you indicated agree or strongly agree for any of the items, provide any additional context around your responses or examples relevant to this set of questions.

Q16. Please indicate the level of priority you believe the program should place on each of the following actions in support of Goal 2 of the strategic plan.

	Not a priority	Low priority	Priority	High priority	Highest priority	Unsure	Prefer not to respond
A. Connect resilience concepts with ongoing and future restoration work	0.0%	4.2%	39.6%	33. %	16.7%	6.3%	
B. Review integrity, archiving, and accessibility of data from science in support of restoration projects	2.3%	11.4%	40.9%	31.8%	6.8%	4.5%	2.3%
C. Describe connections between outputs from the Status and Trends Report, Habitat Needs Assessment-II (HNA-II), and Ecological Resilience Assessment	0.0%	11.6%	37.2%	30.2%	7.0%	14.0%	
D. Provide learning sessions regarding accessibility and usability of the LTRM data	2.3%	4.5%	52.3%	25.0%	11.4%	4.5%	

Q17. If you indicated not a priority or low priority for any of the items, please provide any additional context around your responses or examples relevant to this set of questions.

Q18. If you indicated priority, high priority, or highest priority for any of the items, provide any additional context around your responses or examples relevant to this set of questions.

[Continue on next page]

Goal 3

The following questions relate to Goal 3 – "Engage and collaborate with other organizations and individuals to help accomplish the Upper Mississippi River Restoration vision."

Q19. Please indicate the level of priority you believe the program should place on each of the following actions in support of Goal 3 of the strategic plan.

	Not a priority	Low priority	Priority	High priority	Highest priority	Unsure	Prefer not to respond
A. Conduct targeted outreach to inform watershed restoration practitioners (e.g., USDA-NRCS) of recently identified HREPs	4.2%	20.8%	39.6%	18.8%	6.3%	10.4%	
B. Distribute information on program impact by congressional district more broadly	0.0%	6.7%	48.9%	17.8%	6.7%	20.0%	
C. Modify conceptual models for public facing communication purposes	11.1%	20.0%	31.3%	8.9%	8.9%	20.0%	
D. Simplify concepts of ecological resilience and HNA-II indicators for use in communication materials	0.0%	17.8%	42.2%	22.2%	11.1%	6.7%	
E. Target outreach to connect watershed groups with LTRM data to help track progress from watershed restoration efforts	2.2%	15.6%	42.2%	24.4%	11.1%	4.4%	
F. Finalize the UMRR communications and outreach plan to focus and enhance external communication	0.0%	4.7%	44.2%	23.3%	14.0%	14.0%	
G. Develop a two-pager to explain the history and establishment of UMRR	6.7%	28.9%	40.0%	4.4%	11.1%	8.9%	
H. Develop a pool-scale pilot engagement strategy to address watershed influences	4.7%	11.6%	27.9%	27.9%	4.7%	23.3%	
I. Assemble a one- to two-page scope of work to capture intended efforts under Goal 3	0.0%	25.6%	41.9%	9.3%	2.3%	20.9%	
J. Assess reach of science and monitoring information **nationally**	2.3%	27.9%	32.6%	14.0%	0.0%	23.3%	
K. Assess reach of science and monitoring information **internationally**	7.0%	32.6%	25.6%	11.6%	0.0%	23.3%	

L. Add a "if you only have a minute" section to the UMRR website	2.3%	27.9%	23.3%	18.6%	2.3%	25.6%	
M. Link together habitat restoration projects with existing watershed projects and upstream contributors	4.7%	9.3%	27.9%	25.6%	16.3%	16.3%	
N. Evaluate the use of LTRM data in nutrient reduction assessments	4.8%	11.9%	38.1%	23.8%	2.4%	19.0%	
O. Share internally (within the program) about upcoming public engagement opportunities	0.0%	14.0%	51.2%	23.3%	2.3%	9.3%	
P. Develop messages that convey the value of integrating both program elements (HREP and LTRM)	0.0%	9.3%	44.2%	34.9%	4.7%	7.0%	
Q. Develop messages that convey the program's **national** significance	2.3%	14.0%	34.9%	32.6%	4.7%	11.6%	
R. Develop messages that convey the program's **international** significance	4.7%	30.2%	27.9%	18.6%	2.3%	16.3%	
S. Collaborate with other large aquatic ecosystem/water resources programs to share knowledge and enhance program implementation	0.0%	14.0%	48.8%	23.3%	9.3%	4.7%	

Q20. If you indicated not a priority or low priority for any of the items, please provide any additional context around your responses or examples relevant to this set of questions.

Q21. If you indicated priority, high priority, or highest priority for any of the items, provide any additional context around your responses or examples relevant to this set of questions.

[Continue on next page]

Goal 4

The following questions relate to Goal 4 – "Utilize a strong, integrated partnership to accomplish the Upper Mississippi River Restoration vision."

Q22. Please indicate your level of agreement or disagreement with each of the following statements

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree	Unsure	Prefer not to respond
A. UMRR has a highly engaged regional partnership	0.0%	2.1%	10.6%	36.2%	42.6%	8.5%	
B. The partnership is supportive of the program and its output	2.3%	0.0%	6.8%	36.4%	43.2%	11.4%	

Q23. If you indicated disagree or strongly disagree for any of the items, please provide any additional context around your responses or examples relevant to this set of questions.

Q24. If you indicated agree or strongly agree for any of the items, provide any additional context around your responses or examples relevant to this set of questions.

Q25. Please indicate the level of priority you believe the program should place on each of the following actions in support of Goal 4 of the strategic plan.

	Not a priority	Low priority	Priority	High priority	Highest priority	Unsure	Prefer not to respond
A. Maintain an annual narrative of accomplishments made in alignment with the strategic plan	0.0%	26.1%	50.0%	15.2%	4.3%	4.3%	
B. Undergo programmatic strategic planning to address increased UMRR funding authorization	0.0%	14.0%	34.9%	34.9%	9.3%	7.0%	
C. Create a directory of UMRR program partners	4.5%	25.0%	52.3%	9.1%	4.5%	4.5%	
D. Establish a UMRR brown bag webinar series	4.8%	26.2%	40.5%	9.5%	7.1%	11.9%	

E. Develop a reference list of UMRS-related habitat plans and strategies (e.g., Landscape Conservation Cooperatives, State Wildlife Action Plans)	4.5%	22.7%	45.5%	9.1%	2.3%	15.9%	
F. Evaluate how HREPs contribute to local economies	4.5%	9.1%	36.4%	31.8%	9.1%	9.1%	
G. Update existing information on economic value of UMRR to the region	2.3%	7.0%	44.2%	27.9%	9.3%	9.3%	
H. Create a narrative around missed restoration opportunities because of existing policies	0.0%	15.9%	20.5%	36.4%	11.4%	15.9%	
I. Coordinate LTRM visits to various HREPs	0.0%	18.2%	43.2%	15.9%	9.1%	13.6%	
J. Facilitate more frequent exchanges between UMRR partners and various coordinating entities, including restoration practitioners, scientists, the A-Team, and District river teams	0.0%	20.5%	43.2%	13.6%	9.1%	13.6%	

Q26. If you indicated not a priority or low priority for any of the items, please provide any additional context around your responses or examples relevant to this set of questions.

Q27. If you indicated priority, high priority, or highest priority for any of the items, provide any additional context around your responses or examples relevant to this set of questions.

Q28. Please suggest any other items that should be discussed during the review of the strategic and operational plan.

Q29. Please provide any additional comments you may have.

Appendix B. Raw results of open-ended survey results

Goal 1: Enhance habitat for restoring and maintaining a healthier and more resilient Upper Mississippi River ecosystem

Raw results of open-ended survey questions on success criteria and priority actions were categorized by the item to which they predominantly pertain:

Goal 1 Success Criteria:

A. HREPs enhance the health and resilience of the Upper Mississippi River

Disagreement

- This is more of a philosophical answer to the question, but restoration implies returning a habitat to what it was pre-alteration (manmade or otherwise), however some of the projects with which I have been involved appear more focused on creating a certain type of habitat (i.e., overwinter fish habitat, moist soil management for waterfowl). While these projects are a benefit to fish and wildlife they are not really a restoration of what was there historically.

Agreement

- I've been around long enough to be involved with (or have strong knowledge of) HREPs in my reach, and I have seen first-hand the positive benefits of each. I'm specifically talking about positive fisheries and/or floodplain forest and aquatic vegetation responses, and associated enhanced recreational benefits due to the improved habitat conditions.
- HREPs are one of many necessary steps to enhance the health of the river system.
- Seeing fisheries and vegetation improvements in project areas
- Intuitively, I agree that HREPs increase resilience, however we have not yet defined 'Resilience' to a sufficient degree to quantify or measure how much resilience they add to the system.
- It is likely there are lots of perspectives on this. With 30+ years HREP experience, none of the HREPs have ever been implemented to achieve pool-wide benefits. Yet, there are some who determine the success of a project based on its pool, reach or system influence. Therefore, scale of enhancing health and resilience is an important factor to consider. Also, is one's perspective from habitats/complexes or from "natural processes?" All HREPs affect processes to achieve a habitat/biotic objective that can only be met IF the right combination of drivers/processes are addressed. But, the ambiguous term "natural processes" is often referred to as a measure of success. Question then becomes "Natural processes for what?" (desired habitat/biota). Many of the HNA process indicators can be measured, but without specific ties to habitat/biota that require a specific combination of drivers/processes, have we achieved success in the context of agency/public desired futures by just restoring natural processes? Also, natural processes often do not include documentation regarding what the natural rate (pre navigation improvements) of that process was on the UMR. To highlight this concept, there is concern with Lake Pepin filling in, but that is a natural process. What really is of concern is that the RATE of filling has greatly accelerated due to sediment delivery from the watershed.

- As an LTRM WQ component specialist, I spend extensive time sampling in the field and see the success of HREPs evidenced by their use by wildlife (waterfowl, sportfish, aquatic vegetation) and general public (fisherman, duck hunters/bird watchers). Pool 8 Phases 1,2 and 3 are a great example of this.
- I agreed with many statements, but did not strongly agree because I think restoring ecosystem processes at a larger scale than an HREP is more meaningful. UMRR provides great opportunities for expanding and rehabilitating habitat for preferred fishes and wildlife, but does not address the actual causes of habitat degradation, like impacted watershed hydrology. I think that UMRR provides improved stakeholder opportunity and benefits a variety of species in the ecosystem, but should not be held up as the best possible model for ecosystem restoration to developing programs in other watersheds because it only addresses symptoms.
- HREPs help benefit the health and resilience of the UMRR; however, we believe there is still a lot to do on the system and robust research and monitoring may be utilized to help better assess the impact the UMRR program is having on the system.
- HREPs restore geomorphic form and hydrologic function to improve habitat
- To me, one of the focal points of HREPs is to keep sand within the system and use that sand to enhance the ecosystem by creating or restoring various habitat types for wildlife.

B. Restoration projects provide opportunities for scientific research and inquires

Agreement

- HREPS can be excellent opportunities for research; but UMRR does not take advantage of this opportunity to the extent possible
- I neither agree or disagree on the question about scientific research and HREPs because we don't properly conduct pre and post project impacts and instead make a lot of inferences and opinions. WE also tend to focus out success based on recreational value in a lot of HREPs.
- It seems like academia works with a lot of in-land state projects, but very few projects working with federal partners. I think we need to include academia more with our work.
- Plethora of peer-reviewed articles describing research project assessments
  Collection of LTRM data
- Every HREP is an experiment because no 2 are exactly alike. There is a lot to learn from focused research on completed HREPs and the existing habitats many HREPs are designed to emulate. While HREPs do provide the opportunity for research and inquiry, to treat them as true experiments can be very expensive and challenging. For example, if 2 separate construction contracts are needed to do the experiment, this adds to the overall cost of the research (i.e. typical mobilization costs for construction are in the range of $200,000-500,000). The logistics of integrating inquiry/experimentation are also a challenge. Does the partnership delay construction of a long awaited HREP to collect experiment related control data, collect data on experiment and then wait X years to come back and finish project? Perhaps one line of research/inquiry that is needed is multi-year, multi-year, multi-driver based targeted research. I believe UMRR has done a couple of these, but my perception is that nearly all targeted research inquires last 1 to 2 years. Maybe some targeted multi-year (decade?) research is needed to better link micro habitat influences that perhaps are not detectable at the LTRM pool-wide monitoring scale.
- In the past, there has not been sufficient research and monitoring to confirm the benefits of constructed HREP projects; however, in recent years, improvements have been made in this area.

C. UMRR is recognized as a premier program in large river restoration

Disagreement

- C. D. E. UMRR HREPs a not well known even within the 5 Upper Midwest states (one of our former fish chiefs called them, "the best kept secret in WI." He went on to say that anyone of the projects elsewhere in the state would be statewide news for years, yet we are constantly working on them. UMRR HREPs would more than meet each of these statements if there was greater awareness regionally, nationally and internationally. My perception is there is greater awareness of the LTRM component than HREPs. Predominantly because of peer reviewed publication of the LTRM research and monitoring and presentations at professional conferences. However, it is much more challenging to get peer review publication of each individual HREPs project performance and/or the science and data that goes into the project design.

Agreement

- UMRR generates examples and lessons learned that can be applied to Great Lakes restoration.
- UMRR is well known and respected as a leader in this work.

D. UMRR serves as a source of guidance on restoration for similar programs nationally

Disagreement

- Unsure that UMRR recognized nationally as leader. Depends by who. Prior to my appointment as NRCS Rep to this project, I knew very little or nothing about UMRR, and I was actively working on another big river immediately adjacent.

Agreement

- I agree that the UMRR is a source for guidance nationally and internationally (this is happening now for the LMR), but I also think we could do more to look outward at other sources to adapt or modify our programs.
- Attendance at national meetings detailing UMRR activities
- Agree that UMRR provides an example for other restoration programs, but UMRR has many unique features that don't apply elsewhere.
- HREPS are so unique they offer a great deal of "lessons learned to other restoration activities locally, nationally, and internationally.

E. UMRR serves as a source of guidance on restoration for similar programs internationally

Disagreement

- I think we could work to bring more attention to our projects nationally and internationally. I see very few presentations at AFS about projects on the Mississippi River.

Agreement

- Attendance at international meetings detailing UMRR activities

Goal 1 Priority Actions:

A. Hold a programmatic discussion on adaptive management to define, operationalize, and implement adaptive management

No- to low-priority

- This is a low priority for several reasons. First and foremost, one concept of adaptive management has traditionally been applied to first time projects on a system. Therefore, the term/approach does not fit UMRR due to it being a 35-year-old program. Is there a need for better monitoring and accessible lessons learned and performance reports? Yes. The strategic plan lays out many initiatives that would promote and sustain greater integration of the monitoring, research and restoration. All of which is at the heart of one definition of adaptive management. Another this is low is because there are so many different definitions of adaptive management. Some focus on the research component, but others simply focus on maybe fixing a project if objective metrics are not met (COE definition of adaptive management). We have been doing adaptive management since EMP was authorized. HREPs are implemented based on lessons learned from previous projects and many DPRs include specific reference to lessons learned. What is lacking for more use of LTRM findings is historically the findings didn't necessarily crossover to HREPs. I'm very optimistic many findings from the past several years of science planning will provide information useful for successful consideration in HREP planning. Perhaps what is missing is documentation on what the HREP practitioners have learned about achieving (or not) habitat/biotic objectives.

Priority, high priority, or highest priority

- Operationalizing adaptive management is the highest priority in my opinion. As the program nears its 4th decade, initial HREPS are degrading and adaptive solutions are not being addressed/implemented because of a lack of adaptive management implementation.
- AM is an important, sometimes misunderstood element to ER. It needs to be understood by all.

B. Define appropriate temporal and spatial scales for determining physical and biotic response of habitat project objectives

Priority, high priority, or highest priority

- Defining appropriate scales for response will equip us to answer questions about project success and AM needs. We currently have a disconnect between claiming success at project scales and measuring success at a systemic scale. Currently, we would be hard-pressed to detect a signal at the systemic scale, even if we knew what we were looking for (that's part of the issue -- we need to better define and quantify what desired our systemic future looks like).
- A better understanding of the scale at which projects can be expected to affect the ecosystem would inform how their impact/success is assessed and communicated within and among agencies. In the absence of this information, such assessments are difficult at best.
- We need to understand the impact of our projects.

C. Establish consistent and standardized HREP monitoring

No- to low-priority

- For questions about standardizing HREPs - site needs are so varying and different; some elements, if standardized, would not be used.
- Let's be flexible in our monitoring (see D).

Priority, high priority, or highest priority

- Pre and post monitoring of HREPs could be improved with standardized monitoring. As it currently stands, I'm not sure we truly evaluate the effectiveness of HREPs towards enhancing the river.
- The benefits of standardizing monitoring have been discussed frequently. But making it happen will require a person or people charged with making it happen. Doing so would substantially increase the value of the data collected and would make compiling and serving the data much easier.
- Evaluating projects and providing summary reports in a timely fashion pre- and post-construction allows us to make any necessary informed design modifications and/or implement adaptive management strategies in a timely fashion. Further, it helps to inform the development of future projects based on what has been successful and lessons learned.
- Would like to see more of a focus on evaluating current HREP success, impact on all flora and fauna within the entire UMRS, and utilizing current data from this to drive future HREP design and HREP operation. It is concerning that there little focus on completing monitoring within these high dollar projects.
- A central location of data would be nice for project planning. Let's use our past projects to improve our future projects.

D. Where appropriate, use LTRM's sampling design and protocols for monitoring HREPs

No- to low-priority

- LTRM methods may too simple to properly evaluate the projects.
- LTRM monitoring typically is not directly suitable for HREP scale of impact; mimicking LTRM sampling at final spatial scales would seemingly be necessary, or else design HREPs for larger scale impacts
- Some LTRM sampling design and protocols may not be appropriate for project scale monitoring. Also, there may not be protocols for some of the objectives (i.e. mussels and forestry). It would be very beneficial to DEVELOP appropriate standardized HREP performance monitoring criteria and document how it relates to trend results LTRM protocols are designed to detect.
- Monitoring should be flexible to capture site specific information. One size does not fit all. But if LTRM data collection is valid - sure, use it.

Priority, high priority, or highest priority

- We all understand the value that LTRM brings to understanding the river through standardized monitoring, therefore it should not be a stretch to understand why it's imperative that we adopt standardized approaches to HREP monitoring using LTRM methods (or a statistically compatible modification of those methods). Development will enhance our ability to answer questions we receive about responses to HREPs (success, failure, uncertain), and will provide valuable insights for adaptive management.
- "Where appropriate" is important in this sentence. If the same parameters LTRM measures are measured in assessing an HREP, it makes sense to use the same methods to facilitate not only comparisons with LTRM data, but also with data from other HREPs.

E. Centralize HREP data and collect and digitize historic data currently stored in computers and file cabinets

No- to low-priority

- I marked low priority on digitizing records because I think there are higher uses of time unless that effort is required to complete a higher priority need.
- It's unclear that the yield of undertaking this would be worth the amount of effort involved. Standardizing methods and centralizing the data from current and future projects seems more important. If/when that is accomplished, then this could be addressed.

F. Complete HREP project evaluation reports (PERs) across districts

No- to low-priority

- I marked unsure on PERs because I don't think there is a lot of value in those recently. They are not a true assessment of the functionality of HREPs as they were intended.
- Without improvements to implementing adaptive management, publishing PERs is a waste of time except for understanding the true O&M costs of design features.

Priority, high priority, or highest priority

- PER needs to be improved to actually provide meaningful data in a useful timeframe to inform future project development. Data sharing can be difficult, especially if data templates are inconsistent. Different districts and states have different procedures for monitoring, evaluating, and reporting, some of which seem to be too relaxed. If reporting happened faster, it could help PDTs working on similar projects develop improved alternatives or have better data about habitat units for CEICA.
- PERs are an important document usually with very low priority. We need to document project performance.

G. Craft narrative around how new HREPs will collectively address the needs of the river

No- to low-priority

- Maybe I don't understand all the implications of this, but I think we already have a lot of narrative that describes how HREPs will address the needs of the river.
- A partnership developed narrative on how individual and cumulative HREPs address needs for the river is needed BUT first we need partnership derived habitat and biotic objectives. We do not have this, especially as it relates to tying resilience drivers to biotic communities and sub-systems. The need for this is in the HNA II documents need section. If a narrative is done, it MUST include all HREPs not just the new ones.

Priority, high priority, or highest priority

- Important to document success, important to maintain standardized sampling, very important to describe our efforts and success to public.
- We need to document the project local value as well as river wide or migration/flyway value.

H. Create and certify additional Habitat Suitability Index (HSI) models (e.g., diving duck, gray squirrel)

No to low priority

- IBID. We can recertify models as they age, but no more are needed.
- We have plenty of adequate habitat models. No more are needed!

- Generic plans to "certify additional models" are not useful. What information is needed? Is an additional model the best way to get it? How will the model be used? Unless/until those are specified, this can't be made a priority. Once such specifications are made, this may be a high priority.
- HSI models were designed to "assess" ecological success for a suite of fauna through one generalist species. They do not assess the negative impacts that an HREP will have. For everything we do in natural resource management, we will likely have a positive impact on a suite of species, but we will also have a negative impact on another. We do not assess that negative impact enough to thoroughly have an understanding at the systemic level.

Priority, high priority, or highest priority

- We also need to update our certified models so that they fit the projects we want to work on.
- Habitat models need to be revised as better data comes in, but the process to revise or recertify seems to be prohibitive from cost and schedule perspectives. None of the projects or models seem to have a component dedicated to habitat for mussels or fluvial nongame fishes, but these are important and declining riverine faunal groups.

I. Create additional ecosystem models (e.g., floodplain forest succession)

No- to low-priority

- Just not a priority. We have many other basic needs to better tie LTRM to HREP and the predictive models may not be the best approach.

Priority, high priority, or highest priority

- We need new models to assess the benefits of projects. Our current approach is a joke and the models used provide no real assessment. There are several others that I marked as priority and above but I think may vary based on projects and impacts and what exactly is done to meet that statement. Some projects may do well in some of those categories already and some may not depending on the caliber of the project, PDT and project manager, which can make a huge difference on some of these categories unfortunately.
- Placing a priority on developing ecosystem models will not only inform future scenarios (alternatives with/without project), but the results can be applied to development or refinement of the HSI models. We need to better tie the HSI models to our desired outcomes.

J. Conduct a programmatic evaluation of specific restoration techniques

No- to low-priority

- We will be much further ahead if we focus on the habitat/biotic objective vs. trying to learn about every nuance of a tool. Ecosystem restoration requires a diverse mix of tools appropriate for the desired objectives of a project at a given location on the river. A better approach would be to prepare a UMRR handbook similar to the HREP design handbook, but have its focus be on the various HREP objectives and describe how different projects implemented features to achieve the physical and chemical criteria of an objective.
- Programmatic evaluations end up on a shelf and not looked at. Waste of time.

Priority, high priority, or highest priority

- We need to pass on the history/success of projects (techniques/data/monitoring/reports) to the upcoming biologists that are coming to the table as our experienced biologists/hydrologists/managers retire.

K. Evaluate where better guidance would help restoration practitioners optimize and appropriately utilize the LTRM data

Priority, high priority, or highest priority

- This is frequently discussed and often as a result a webinar is given or some other band aid is attempted. A long term solution to this is to develop a person (or people) within the restoration practitioners of the UMRR that is well-familiar with the LTRM data and it use. That person would then be able to assist in this transfer of information.

L. Conduct initial HREP project evaluation report five years post-construction

No- to low-priority

- From the context of performance monitoring a better target would be 10 years (item J). The 5 year performance could document initial physical response (i.e. DO, Vel), but 5 years very likely is not enough for many biotic objectives which HREP PERs should focus on more in the future. What really is missing is a timely completion of HREP as-builts, documentation of any changes done between feasibility and final constructed feature and lessons learned section. An example of change between feasibility and construction is Pool 9 Island. The feasibility report included features for centrarchid over-wintering. However, value engineering resulted in necessary features not being built to save cost, which was documented in the VE proposal. Problem is the VE is an appendix to the feasibility report and no change in project objectives were made to the main report.

Priority, high priority, or highest priority

- Again, PERS are very valuable. they need to be done every 5 years. This should be an O&M Sponsor responsibility to lead these efforts.

M. Conduct final HREP project evaluation report ten years post-construction

No- to low-priority

- Unsure if 10-year post construction report should be final. Much changes after 10 years and the success of the HREP is determined long-term.
- The HREPs are being studied post-project.

Priority, high priority, or highest priority

- I'd like to see PERs every 5 years for 25 years, not 10. How can you assess forest impacts after only 10 years?

N. Conduct outreach to potential candidate nonprofit organizations to inform them of the potential to cost share and solicit input

Priority, high priority, or highest priority

- I would like to see more collaboration with NGO's that are interested and/or engaged this work.

O. Improve the reporting of operation and maintenance costs and activities within individual HREP project evaluation reports

P. Develop and maintain a habitat project status summary that includes reference to critical decision points for project development

No- to low-priority

- Project status summary - PDT leads don't need another thing to fill out and update and maintain; we need to dedicate time to the project itself.
- The PDT should be documenting their decision making process now - it should be a SOP now rather than just starting it.

Q. Design HREP project features that minimize both operation and maintenance and first construction costs

No- to low-priority

- Unclear how you would minimize two things simultaneously. By minimizing the total cost of both? But one (O&M) is uncertain and would need to be estimated over the 50 year project life."
- This is an extremely low priority. This has been done and the result was Pool 9 Islands – an all rock "island" because it was the cheapest alternative to break up wind fetch for improving environmental conditions for aquatic vegetation. It certainly is low maintenance and low cost, but does not provide a lot of variety in ecosystem benefits.
- I think minimizing costs should be secondary to meeting the project objectives and addressing ecosystem needs.
- It isn't always possible to implement low cost and low O&M restoration features.
- Operation and maintenance costs are a primary concern of the Sponsor and may be considered lower in priority to other partners.
- In my opinion the HREP should use the maximum available funding on projects themselves and build as many as possible as there are plenty of needs throughout the UMR. Studies or planning events that take money away from shoveling dirt should be minimized. The projects completed have been highly successful and well regarded in our agency. Just want more of them.
- I have a concern that many new HREP projects are designed and pushed in order to execute an appropriated budget. More focus and funding should be placed on fixing/rehabing existing HREPS. HREP focus is primarily on waterfowl and sometimes fisheries (focus of sponsoring agencies). This at times is a conflict with existing high quality habitat and contributes further to habitat loss and degradation. Failing HREPS due to sedimentation require site managers to hold more water in order to provide waterfowl habitat and duck hunting capabilities, which further degrades terrestrial habitat. Lets fix what we got before we focus on new projects.
- Reporting O&M costs is not a priority for me (biologist).

Priority, high priority, or highest priority

- We do not know how to do this or how to fund it.

Goal 2: Advance knowledge for restoring and maintaining a healthier and more resilient UMR ecosystem

Raw results of open-ended survey questions on success criteria and priority actions were categorized by the item to which they predominantly pertain:

Goal 2 Success Criteria:

A. Research and monitoring inform restoration and management efforts

Disagreement

- In my opinion, we do not use LTRM currently to inform projects or where we should focus projects even after HNA-II. We are still taking a spread the peanut butter approach to make all partners happy and are limited to where we can construct projects based on PPA limitations.
- While LTRM coverages may be used for project planning (LIDAR/Bathymetry), it is project specific data collection (fish/veg/wq/mussels) by partner agencies and COE hydraulic models that have had greater role in informing restoration and management efforts when it gets to planning and implementation. One reason is that for project design site specific data is needed and that does not exist in non-LTRM pools. Agency policies/management priorities/data and Inter-agency project development team dynamics historically and currently have much greater influence on restoration and management efforts than LTRM data and research. Also, how to use systemic resilience indicators are poorly understood by management community and the relationships to habitat/biotic objectives has not been developed.
- If done appropriately, research and monitoring can be beneficial. Accurate knowledge and understanding of historic conditions and disturbances are probably a more important than future research/monitoring.

Agreement

- Research can inform restoration if practitioners use it.
- There is a lot more data and science going into current projects than some people would like to project.
- LTRM monitoring, and especially landcover/bathymetry data, are fundamental to the planning and design of HREPS, but importantly also provide an ongoing description of the basic condition of the river, the understanding of which is central to selecting/planning future HREPs
- Decisions and identifying priorities should be science and data driven.

B. UMRR effectively detects the status and trends of the Upper Mississippi River as related to indicators of ecosystem health and resilience

Disagreement

- While the indicator work done to date is commendable, there are elements that are missing. Examples include: velocity, fetch, flow distribution. Great start, but more are needed so that the combination of indicators can be used to start including indicators for quality of habitats.

C. UMRR effectively detects the status and trends of the Upper Mississippi River as related to the restoration and management of the river

Disagreement

- I struggle with "effectively detects...the restoration and management of the river." This is likely true for certain pools and/or certain components. I'm not saying we do a poor job monitoring the status and trends, but with the scope of watershed influences etc., are we able to effectively detect status and trends directly related to management actions? I don't know that we can without additional monitoring in key tributaries.
- This is all a matter of scale. All of the indicators need have an analysis of what is the minimum scale it can detect a change. Another element that has to be considered is incorporation of project level features. For example, it does not appear that physical features of many HREPs are not included because the as-built elements (i.e. dredge cuts or emergent marsh) are not updated in the bathymetry and LIDAR.

Agreement

- This is what LTRM was designed to do and it does it well.
- Management should be data driven. Follow-up monitoring needs to occur to determine project success. The status and trends reports effectively gives managers a good assessment based upon the data available (need more data on HREPs!!!)

D. UMRR effectively communicates the status and trends of the Upper Mississippi River as related to indicators of ecosystem health and resilience

Disagreement

- We don't do a very good job telling the story about status and trends. Hopefully the ST3 rollout strategy will correct that. We still have some disconnect between the indicators of Eco Health and Resilience, and the Restoration and Management of the river. Have we adequately defined (as a partnership) the desired outcomes (future condition or "when are we done?") and are we measuring all the correct indicators of those outcomes? The HNA II helped move us that direction, but I'm not certain that we are expressing a collective future and measuring all the right pieces to say that we're making progress with certainty at all scales -- at some scales we can, but not all
- Listed as unsure and too early to assess since this will be the first status and trends it is used in.
- There is a large disconnect between UMESC and land managers, especially the further south the program extends.

Agreement

- LTRM data and results are continuously communicated through various means (fact sheets, presentations at various partnership venues, publications, conversations among UMRR partners, etc). Communicating across all of the agencies, organizations and people interested in the UMRS, will likely always be a challenge, and improvements can always be made. The forthcoming 3rd status and trends report will be an important component of communications in the near future.
- Research and monitoring results included in fact sheets for new projects

E. UMRR effectively communicates the status and trends of the Upper Mississippi River as related to the restoration and management of the river

Disagreement

- I would like to see increased communication in this area with the public, local communities and NGO's working in this space.
- S&T indicators are not the same as HNA indicators. LTRM monitoring does not usually detect HREP impacts (except P8). S&T indicators communicate the health of the UMRS

F. UMRR is recognized as a premier program in large river monitoring and science

Agreement

- The LTRM element is a great model for other national and international modeling programs.
- Consistent funding by congress indicates success
- Publications and presentations frequently produced or given
- The UMRR is one of the premier programs in the country.

G. UMRR serves as a source of guidance on monitoring and science for similar programs nationally

Disagreement

- Not all programs nationally have funding for extensive monitoring like UMRR.

Agreement

- UMRR monitoring and science can provide examples and lessons learned for Great Lakes programs.
- LTRM personnel are frequently invited to present the results of our monitoring in regional, national and international venues. LTRM personnel are also consulted by others working to start or modify river monitoring programs. Multiple exchanges with scientists in China are the clearest example of the international aspect of this.

H. UMRR serves as a source of guidance on monitoring and science for similar programs internationally

Disagreement

- I don't feel UMRR is that internationally relevant.
- E. - H. All of these specifically relate to the HREP component with regards to my observations. I have worked on many inter-state groups. The restoration work we do is almost always news to them. Therefore, if they are not even aware of the projects, then it shows we have much more to do with regards to communication. The main way is to have the biologists and managers talk about the program so other on the ground practitioners are aware of how integral the managers/biologists are to successful projects and that it is not just a COE program. What impresses folks the most is the partnership the projects are implemented in and it's longevity. Also, to make it pertinent is a challenge. For example, even within the 5 UMR states, what we do on the river is hard for folks to fathom being done inland.

Agreement

- We have been recognized nationally and internationally in the past, but I don't know how much we have been recognized of late. We need to make attendance at scientific and restoration conferences a program priority.

Goal 2 Priority Actions:

A. Connect resilience concepts with ongoing and future restoration work

No to low priority

- This also needs to include a finer resolution step of finer resolution that includes what specific combination of resiliency concepts/drivers are needed to achieve habitat for species/ guilds/major resources so that the engineers can cross-walk HREP design criteria to the resilience controlling variables.

Priority, high priority, or highest priority

- Resilience is key with regards to a changing system...we are in a constant flux regardless of what we would like to believe. Climate change is only exacerbating that issue and furthering the need to focus on resilience.
- Resilience research dictates next generation projects
- UMRR mission statement says we are working to increase health and resilience of the UMRS. This is required to do that.
- During the time of climate change and constant changes to the dynamic environment, we need to be thinking of long term resiliency of these resources.
- While these are priorities and provide insightful information, there remains some lack of clarity around resilience and how to integrate resiliency concepts into on-the-ground restoration and resource management within the authority of the UMRR Program.
- There is a need for a structured somewhat mechanistic way to incorporate resilience concepts into project selection. The recent FWWG effort to select projects was done pretty much the same way it was done 20 or 30 years ago.
- There is little to no monitoring occurring assessing HREP success or resiliency.

B. Review integrity, archiving, and accessibility of data from science in support of restoration projects

No to low priority

- Also need to include non-ltrm data from COE and partner agencies with appropriate documentation on their methods and data integrity.
- Accessibility and integrity of Science in Support projects seems to be covered well by the USGS review process. I am uncertain though about projects that never go through that process. My answer may be "priority" for data and work that don't eventually end up in the USGS process.

Priority, high priority, or highest priority

- The issue is less the integrity than the accessibility and archiving of data from these projects. This needs to be addressed.

C. Describe connections between outputs from the Status and Trends Report, Habitat Needs Assessment-II (HNA-II), and Ecological Resilience Assessment

No to low priority

- Unclear to what end this would be undertaken. If that is clarified, this might be a priority.
- This is marked as "UNSURE" because of HNA II. A lot a great analysis and layers were developed for HNA II. However, other than developing a metric for their condition, we also need to test for scale sensitivity and to complete several of the future needs item to better link the resilience to habitat for what.

Priority, high priority, or highest priority

- We need to show connections among our outputs to garner support from public, agencies, legislators
- Highest priority should be placed on connecting outputs from ST3, HNA, and Resilience so that we can have an informed discussion around desired future conditions.

D. Provide learning sessions regarding accessibility and usability of the LTRM data

No to low priority

- This has not proven to be an effective method for facilitating the use of LTRM data. Perhaps a canned presentation can be recorded and accessed whenever such a need is perceived to arise.
- Analyzing and interpreting the LTRM data is not easy task. While some tools have been developed, there still is a need to have more tools developed to standardize analysis pertinent to HREPs and Resiliency. For example, comparison of the different LC/LU layers across years is confounded by difference in minimum mapping unit, WSEL, discharge, and area interpreted (i.e. the footprints of the different coverages do not match. Additionally, perspective is the management community is approaching data overload, which at times may result in folks basing decisions on a discipline or policy vs. the data. I don't have any answer for how to best promote cross-disciplinary learning and data usage but perhaps sessions specifically set up to show how trade-offs can result or how single guild/species management may impact ecosystem resilience would be beneficial.

Priority, high priority, or highest priority

- Showing partners how to gain access to data shows we are unbiased in our research and open to others utilizing data

Goal 3: Engage and collaborate with other organizations and individuals to help accomplish the UMRR vision

Raw results of open-ended survey questions on priority actions were categorized by the item to which they predominantly pertain:

Goal 3 Priority Actions:

A. Conduct targeted outreach to inform watershed restoration practitioners (e.g., USDA-NRCS) of recently identified HREPs

No to low priority

- I marked unsure regarding the first question surrounding watershed practitioners because I don't know what the intended purpose of the effort would be. I don't understand enough about the need to inform congress and the public. I feel like if we are doing our jobs and showing improvement in the system that should speak for itself. I think more context in those questions are necessary to really provide a proper answer. My default is to do things because they are needed and not because we want a pat on the back. I assume that is related to continued funding for the program but it seems that is already clearly understood in congress. Perhaps I am missing the need and the point there.
- Several thoughts in this one. First, any outreach must include information on all HREPs not just those recently identified. The ones that are completed will be best examples of progress made and lessons learned, plus provides examples of where what we learned may be of importance to them. Second, UMRR is focusing on resiliency that goes way beyond a single HREP. Therefore the message/outreach should be about the program and it's 2 main components. If we want to promote UMRR as an integrated program, the message should also be integrated.

Priority, high priority, or highest priority

- Need to engage NRCS in watershed protection efforts
- Should also include the river management community as part of the target audience

B. Distribute information on program impact by congressional district more broadly

C. Modify conceptual models for public facing communication purposes

No to low priority

- For communication efforts, some of this is already being completed currently so I marked as not a priority. Simplifying things for the public is important but I don't think pushing conceptual models in public communications is useful.

Priority, high priority, or highest priority

- Development of the conceptual models should include partner subject matter experts outside of LTRM personnel and inter-disciplinary input for more holistic subsystem models incorporating multiple major resources.
- Preparation of the message needs to be broader than just the A-team and LTRM specialists. Must include the partnership management community. This would be a much more useful and productive product if Subsystem and Major resource goals, objectives and criteria were developed by the partnership. Presently, the partnership only has a qualitative assessment of individual resiliency

metrics and indices primarily based on processes or physical attributes. The partnership does not have resiliency based habitat/biotic goals and objectives for the subsystems or major resources.

D. Simplify concepts of ecological resilience and HNA-II indicators for use in communication materials

E. Target outreach to connect watershed groups with LTRM data to help track progress from watershed restoration efforts

No to low priority

- Tracking progress likely will require data from pool that is receiving water for the watershed tributary. There are several watersheds where the nearest downstream LTRM data is out of state, and several other additional tributaries inputs away. While some practitioners may see an opportunity, it may be challenging to craft a message local citizens can understand the linkage.

Priority, high priority, or highest priority

- If there are watershed groups doing actual watershed restoration, LTRM should be aware of them and share data from the most pertinent pool(s) to see if their actions have a measurable impact on the Mississippi. Communication and branding are critical to continued success, especially if NESP gets construction authorization or if UMRR wants to begin restoring the watershed outside of the mainstem. Messaging needs to continue to include metrics that average folks can comprehend and appreciate, not just scientific measures or habitat unit increase, like increased angler/hunter usage and harvest, O&M (or any other public-born cost) cost savings resulting from the project, jobs supported/local revenue during construction and from increased usage.

F. Finalize the UMRR communications and outreach plan to focus and enhance external communication

G. Develop a two-pager to explain the history and establishment of UMRR

No to low priority

- do we not already have a "2-pager" to summarize UMRR history? if not, maybe this should be higher priority
- Unclear how this would differ from the several existing fact sheets. A new fact sheet that covers recent advances is probably needed, but I wouldn't chose this topic as the focus.

H. Develop a pool-scale pilot engagement strategy to address watershed influences

No to low priority

- This sounds like it is outside of the UMRR authorization regarding taking the lead on.

I. Assemble a one- to two-page scope of work to capture intended efforts under Goal 3

J. Assess reach of science and monitoring information nationally

No to low priority

- While it is a good talking point, I don't think it's necessary to expend effort on understanding assessing the reach of our science and monitoring. We have enough to do already.

K. Assess reach of science and monitoring information internationally

L. Add a "if you only have a minute" section to the UMRR website

No to low priority

- Unsure what this question is asking.

M. Link together habitat restoration projects with existing watershed projects and upstream contributors

No to low priority

- May need to be cautious on how you secure, interpret and utilize non-UMRR projects and data, and how you connect to UMRR.
- If you desire outside participation and support, may need to secure upfront participation in development of scope and plan.

Priority, high priority, or highest priority

- Connecting, enhancing, and working mutually with watershed efforts in any way should be a priority. Strengthening or influencing restoration efforts in the watershed will improve what is flowing to us (the mainstem UMR).
- Watershed efforts are a high priority

N. Evaluate the use of LTRM data in nutrient reduction assessments

O. Share internally (within the program) about upcoming public engagement opportunities

P. Develop messages that convey the value of integrating both program elements (HREP and LTRM)

Priority, high priority, or highest priority

- Messages that convey the value of an integrated program will be beneficial in future discussions related to continuance of LTRM in an era with NESP funding.

Q. Develop messages that convey the program's national significance

Priority, high priority, or highest priority

- The challenge is not conveying the success of UMRR. The challenge is being aware of what the target audience views as a successful project. In may experience, folks want to know how we did/do it. How do they build a partnership that at one time only dreamed of what is UMRR? How does the partnership strike a balance between agency missions/policy and science driven management decisions? How did the partnership succeed in getting authorization and funding? While UMRR has the monitoring and restoration expertise we are still struggling internally with integration of the two elements. The forums I participate in oh and ah over the mapping products, but what they usually have the most questions about is the restoration component. It is a very small subset (usually academia) that are interested in how the LTRM and HREPs are integrated or even question me about the sampling. The reality is, if a survey of the general public or a broad segment of the

resource management profession were done, my experience is they would overwhelmingly have greatest interest in the projects, how we did them (engineering/funding) and how well they responded.

R. Develop messages that convey the program's international significance

No to low priority

- We should focus on efforts that make the program visible on a national scale. international recognition will follow if we adequately address national recognition.

S. Collaborate with other large aquatic ecosystem/water resources programs to share knowledge and enhance program implementation

Goal 4: Utilize a strong, integrated partnership to accomplish the UMRR vision

Raw results of open-ended survey questions on success criteria and priority actions were categorized by the item to which they predominantly pertain:

Goal 4 Success Criteria:

A. UMRR has a highly engaged regional partnership

Disagreement

- There seems to be a lot of apathy in the partnership currently. All partners aren't treated equally, this creates an a level of apathy.
- Has UMRR taken a strong look at what regional partnership should or could entail and whether it has what is needed to achieve desired results/outputs.

Agreement

- I selected "Agree" but will add the caveat that we need deeper engagement from partners in discussions. While there is desire to be engaged, too often people are forced to attend meetings not fully prepared due to workload demands. We need to message that to agency leadership to gain support for staffing, and we need to figure out how to transfer federal funds routinely to the states in support of the program. With increased appropriations, we will exceed our capabilities without additional capacity funding to the states.
- UMRR has exceptional engagement from its stakeholders compared to similar programs in other basins.
- I think some of the agencies routinely make the calls and meetings. Other agencies are noticeably absent.

B. The partnership is supportive of the program and its output

Disagreement

- This is a tough one perhaps due to projects currently in planning. The new planning process leaves little time for collection and understanding of new data. Perception is there is a trend for more single goal/objective projects or even tool driven projects vs. ecosystem based projects. On the LTRM side, many great advances have occurred since the last RTC. Foremost has been the efforts to reach out to the management community.

Agreement

- Most of the Partnership is supportive, seems like some in USACOE are not especially in regards to LTRM
- Partners support the program, but the Corps is hesitant on providing some info, such as economic assessment and some details of NESP.
- UMR is full of folks who are passionate and collaborative towards to end goal of preserving and enhancing the system.
- Opportunities to strengthen the partnership and support of the program exist, particularly through updates to the project sponsorship agreements to increase partnership ability to serve as project sponsors.

Goal 4 Priority Actions:

A. Maintain an annual narrative of accomplishments made in alignment with the strategic plan

B. Undergo programmatic strategic planning to address increased UMRR funding authorization

Priority, high priority, or highest priority

- Are undergoing LTRM Implementation planning tied to increase in funding. Unsure of HREP plans for addressing
- Annual reporting and strategic planning are important to ensure continued or strengthened funding, but shouldn't get in the way of actual program delivery.
- Need to be able to present what is being done with the funds that the public entrusts us with.

C. Create a directory of UMRR program partners

D. Establish a UMRR brown bag webinar series

No to low priority

- In the spirit of work/life balance, not supportive of taking away what should be personal time.
- Brown bag seminars would be valuable, but I feel that they may not pay the dividends sought. Investing in face-to-face interactions between HREP and LTRM practitioners will provide more valuable benefit in the form of expanded networks and hands-on learning at HREP visits or science discussion.

Priority, high priority, or highest priority

- Brown bag seminars are hugely beneficial to partners and public!

E. Develop a reference list of UMRS-related habitat plans and strategies (e.g., Landscape Conservation Cooperatives, State Wildlife Action Plans)

No to low priority

- We need to develop partnership goals and objectives for the subsystems and major resources that focus on the Rivers. These other plans provide some overview for river management, but what is missing is a partnership plan for the river that includes habitats and biotic communities.

F. Evaluate how HREPs contribute to local economies

No to low priority

- Economy and economics should not play into our decision making. We should restore habitats unrelated to the economic or recreational value.

Priority, high priority, or highest priority

- Evaluating the economics of HREPs and how much they really contribute the local economy is needed. Popular HREPs (e.g. Stoddard, Lake Onalaska) have likely paid for themselves many times

over. The program needs to poll the public regarding the types of projects they would like to see more often.

- Determining HREP contributions to local economies will build support for the program
- Data on impacts of HREP projects to local economies will help outreach and continued program success. We should also consider evaluating economic impact of field stations and UMESC to local economies.

G. Update existing information on economic value of UMRR to the region

Priority, high priority, or highest priority

- F - J. All good stuff. Will make the outreach and integration efforts much easier.
- Better economic data about what UMRR contributes to the region and what HREPs generate locally would likely improve outreach and public support.

H. Create a narrative around missed restoration opportunities because of existing policies

Priority, high priority, or highest priority

- There is a large number of potential HREPs that could be completed if the current policies (ex. WRDA language, feasibility cost share, etc) were more NFS friendly. It seems that HREPs are sometimes chosen based upon the ease of sponsor signature rather than which HREPs provide the greatest benefit to the system.
- Existing policies and requirements that prevent us from following through with HREPs that fit the restoration needs should be addressed as soon as possible. PPA requirements create major barriers but also Corps real estate requirements create barriers as well.
- Any opportunities missed because of a policy should be reported in a specific section annually, along with projected economic and environmental lost benefits.

I. Coordinate LTRM visits to various HREPs

Priority, high priority, or highest priority

- LTRM sampling at HREPs could be valuable, like Iowa DNR sampling in Pool 12, but there are better uses of time and funding than running full-blown LTRM protocols for each HREP. I think monitoring should be planned by each PDT, but I do think that periodic "large-scale" HREPs like Pool 12 overwintering would be great and would benefit from LTRM protocols.

J. Facilitate more frequent exchanges between UMRR partners and various coordinating entities, including restoration practitioners, scientists, the A-Team, and District river teams

No to low priority

- UMRR entities meet quite often, so I do not think we need to increase meetings. Communication between entities possibly?? As far as I know, only UMRR-CC and LTRM A-Team posts their meeting minutes
- I don't know how many more meetings the partnership could possibly support. It's great to see everyone, but there are people with job titles that should say "meeting-goer for [agency]" because the actual practitioners cannot possibly do their job and attend a majority of meetings.

- Exchanges already exist between UMRR and coordinating entities. Part of why this program is so strong.

Priority, high priority, or highest priority

- To be integrated, partners need frequent communication across different platforms
- The Program is only as successful as the partnership; therefore, it is critical to maintain and build-up relationships, including recognizing what each Agency contributes to the overall process and partnership. A clear understanding of the Program and internal coordination is critical to maintaining participation and understanding, especially with staff turn-over, policy changes, etc.

Additional Comments

Please suggest any other items that should be discussed during the review of the strategic and operational plan.

- Split of authorized funding between HREP and LTRM elements. LTRM has been at the $5-6M range for base since the beginning of the Program. Would like to upper USACE appreciate LTRM more and give better support. Would like to see LTRM and "Science in Support" as one item again and not split in USACE budget as currently. I understand the why of this; but it is unfortunate
- How to begin addressing/adapting to climate influences.
- How to resolve competing agency priorities and disparate missions.
- A more holistic view of the UMRB may be worth considering (historic conditions, disturbances, and influences; identification of bigger/powerful drivers [e.g. desertification, economy, what 3rd world has/is experiencing]; existing players in the UMRB ecosystem; identification, knowledge and understanding of additional potential partners in the uplands and upper watershed;...). Identification and development of relationships with additional potential partners, and how to best establish and maintain effective communication, and if UMRR has the resources to carry this out for the long term. Consideration of a monthly electronic newsletter (and/or other communication tools) to help strengthen communications between partners, and to encourage and accelerate understanding of UMRR, goals, projects, results, needs,..._UMR seems to currently have rather significant and unified State-level support, and it may be worth strategizing how best to maintain this and how to positively use this to get shared desired end results.
- If there is a means to expand the scope of support and funding available to tributaries and watersheds, it would increase the environmental benefits realized by this program.
- We need to continue to strive towards improving our coordination and efficiency within and between projects to expedite projects while address project partner concerns (i.e. utilize after action reports to inform future project planning).

Please provide any additional comments you may have.

- I am very pleased with the positive strides the UMRR program has made since 2015. I feel that we all (all agencies, the program itself) are operating on a "higher level" than we were 10 years ago. The learning opportunities (via HREP monitoring and regular LTRM component sampling) have been identified and acted upon much more strongly than in the previous decade. In short - this program

and all of its elements, agencies, and staff are headed in the right direction and the UMR and the public will reap the benefits of our work!

- There are lots of great ideas provided in these questions, many of which need a bit more detail on the scale and scope for me to assign priority/agreement. I'm interested on the broader partnership's perspective on these questions.
- Public desires and expectations of projects and project features need to be accounted for. They can't be expected to pay the bill for something they have limited input into.
- Stay relevant and create products that folks can use.
- I answered 'unsure' when I did not understand the question or the intent of the question
- Thank you for allowing me to provide feedback. Have a great week!