

Adaptive Management

Issue Overview

UMRR-EMP continually enhances its restoration techniques through adaptive management, learning from its long term systemic base monitoring, project-specific monitoring, and focused research. Understanding how the ecosystem responds to various restoration approaches/techniques has always been a central theme and a top priority for the program. At its core, adaptive management is an iterative process that includes setting learning objectives, designing and implementing restoration projects, evaluating responses, reevaluating decisions if objectives are not met, and communicating and integrating learned information into future restoration alternatives and hypotheses. Most of the program's adaptive management efforts to date have been focused at the project-scale and on physical and chemical responses — i.e., adjusting project designs based on ecological models, evaluating local effects of individual projects, assessing operation and maintenance activities to achieve project goals, enhancing future restoration efforts through lessons learned from completed projects, and advancing focused research on ecological questions.

Applying adaptive management has significantly enhanced the program's restoration effectiveness and efficiency, by improving project formulation, advancing engineering and design, and decreasing project costs. Implementing adaptive management in more deliberate and explicit ways and increasing focus on measuring biological responses to restoration would further increase partners' abilities to measure project success and restore the UMRS's unique, large, and complex ecosystem. Program partners identified the following purposes for more deliberate and explicit adaptive management:

- a) **Answer broad spatial questions about the UMRS ecosystem and its management, beyond the project-level**
- b) **Identify restoration needs that would be best addressed through “new” restoration techniques**
- c) **Enhance communication and understanding related to project performance and uncertainties in ecosystem management**
- d) **Learn from past and current efforts to inform future restoration**
- e) **Improve the overall effectiveness and efficiency of particular restoration techniques**
- f) **Inform long term UMRS ecosystem management**
- g) **Guide and optimize UMRR-EMP's investment in habitat restoration — e.g., determine at what point there are diminishing returns from investing in certain areas**

Relevant Policy

Section 2039 of the 2007 Water Resources Development Act requires that USACE ecosystem restoration projects include a monitoring plan for assessing project success. Project monitoring costs are considered construction costs and are cost-shared accordingly. Any monitoring that extends beyond 10 years, however, must be fully paid by the non-federal sponsor. **USACE's 2009 implementation guidance for this policy provision (Engineering Regulation 1105-2-100, see pages 83-86) requires an adaptive management component in the monitoring plan that details the nature and cost of any anticipated modifications if the project does not meet its ecosystem objectives.** Whereas prior project performance monitoring focused on physical features, the 2007 authority allows for greater consideration of biological response as part of project performance evaluations.

Partner Recommendation

UMRR-EMP partners support developing more deliberate and explicit approaches to implementing adaptive management.

Specific Action Items

- 1. *Ensure compliance with Section 2039 of the 2007 Water Resources Development Act.*** All definite project reports must include a monitoring plan for assessing performance in achieving the project's restoration objectives. The monitoring plan must also include an adaptive management component that outlines potential modifications if the project does not perform as intended. The FY 2015-19 UMRR-EMP Strategic Plan will create a template for project delivery teams to use in developing project monitoring plans. This will include common metrics for evaluating restoration success, types of data collected, monitoring protocols, etc., so that monitoring data can be compared among habitat projects. The template will also outline the program's approaches to implementing the adaptive management component. [Lead: UMRR-EMP strategic planning team. Completion target: one to two years.]
- 2. *Define priorities for adaptive management analyses.*** Partners will consider the level of investment desired for adaptive management, given all other programmatic priorities, and how best to direct that investment — i.e., what hypotheses should be tested and how? Specific adaptive management topics and studies will be identified and prioritized based on the vision statement, overarching ecological goals, and system-wide objectives for the UMRS that partners adopted in 2009. [Lead: UMRR-EMP strategic planning team. Completion target: one to two years.]
- 3. *Establish a framework for deliberate and explicit adaptive management implementation.*** Partners have agreed to develop a framework to operationalize UMRR-EMP's adaptive management efforts. The framework will address when and how to apply certain adaptive management techniques and how to document, communicate, and integrate the results and conclusions. In addition, the framework will a) identify roles and responsibilities for program partners, b) define key assumptions and adaptive management terms specific to UMRR-EMP, and c) outline programmatic and scientific constraints. [Lead: UMRR-EMP strategic planning team. Completion target: one to two years.]