

Small Group Discussion: Food for Thought

Purpose:

Based on group members' experience, identify for the Project Management Team the challenges and opportunities associated with implementing a large-scale monitoring program that successfully:

1. tracks restoration targets, and
2. produces usable information in a timely manner.

Background:

The Project participants have developed an Adaptive Management approach--based on restoration targets, monitoring and applied studies/modeling--to provide the information that managers will need for decision-making. The Adaptive Management Summary Table integrates data collection and management, tying them to the Project Objectives. This approach begins with a limited set of quantitative restoration targets for the Project Objectives that allow restoration progress to be tracked. We chose *only* those targets that must be assessed to determine whether or not Project Managers can implement more tidal action and still achieve the Project Objectives, in other words whether the Project can move further along the adaptive management staircase depicted in Figure 1. Thus, any restoration benefits or impacts the Project might produce that would *not* affect the decision to add more tidal habitat are not included. While there are many factors we could monitor, a feasible monitoring program can include only the most critical elements. In Phase 1, Project Managers expect to implement all the monitoring and applied studies listed in the Table. However, parameters will be monitored with different levels of effort, based on management needs; applied studies will be implemented based on management needs and degree of uncertainty. The Adaptive Management Summary Table links the data collection needed for adaptive management with decision-making. Here is a brief summary of the role of each column in the Table:

Category. These are the basic elements of the ecosystem that must be monitored to determine whether the Project Objectives are being met or are likely to be met in the future and, therefore, whether the Project can move forward with more tidal restoration. The applicable Project Objectives are listed with each category.

Restoration Target. Each restoration target is a direct measure of a Category and, to our best ability, each gives quantitative, measurable goals for what the Project should achieve to successfully meet each of the Project Objectives. Typical data sources for developing these targets are the literature, quantitative baseline data (such as that collected by USGS, PRBO or SFBBO), or requirements set by an agency, such as standards for dissolved oxygen levels or for clapper rail recovery. Targets will include both long-term goals (50-year horizon) and intermediate conditions as the ecosystem changes.

Monitoring Parameter. The Project participants chose monitoring parameters they believe are the most effective and efficient way to assess change with respect to the restoration targets. This column gives the variables to measure and basic monitoring approach without detailing methods unless needed to make the approach clear. The parameter, method, spatial scale, and timing of monitoring must be adequate to detect change. For example, the first restoration target under sediment dynamics is no significant decrease in South Bay intertidal and subtidal habitat. This target should be assessed by calculating the areas of restored pond,

outboard mudflat and subtidal shallows and a combination of monitoring methods might be used, such as: 1) bathymetry and LiDAR survey every 5 years; 2) survey of sediment accumulation annually in ponds opened to tidal action; and 3) a limited number of localized bathymetry surveys in certain priority areas. This column lists appropriate monitoring parameters, but cannot fully describe the monitoring regime. Appendix 4 gives more information on the expected monitoring procedures for each parameter. A monitoring plan—giving methods, protocols, timing and responsible parties—will be developed by the Project before or early in Phase 1.

Spatial Scale for Monitoring Results. This column gives the spatial scale at which monitoring should occur to detect results usable by managers.

Expected Time frame for Decision-making. This is the time frame in which we should realistically expect to detect change that could lead to management actions adjusting the restoration approach.

Management Trigger. The management triggers give the point at which technical analysts believe the system may not be performing as expected, i.e., potentially moving away from achieving a restoration target. This is when managers will be advised that the trend could lead to undesirable results and management intervention may be appropriate. This is the point at which the consensus of the Project participants is that managers should evaluate the status of the Project and consider management actions.

Applied Studies. The relevant Applied Studies from Table 2, in the Administrative Draft AMP, are listed for each restoration target.

Potential Management Actions. In the event that a management trigger is tripped, the Project Management Team will need to take action based on the available information. This column lists typical classes of management actions available to Project Managers and some examples of those actions. The exact management action taken will depend on the nature of the potential problem and the appropriate remedies available. Typically, the first management action to be triggered would be to conduct a thorough review of the available information that relates to or can inform management on the trigger. Often, Project Managers will ask experts to analyze the relevant information and provide a range of appropriate management actions, including their risks and costs.

Discussion Topics:

1. What monitoring or other adaptive management issues are typically associated with the biological or physical processes your group is discussing?
2. What monitoring methods have proven effective/efficient for other projects?
3. How can large-scale issues such as global climate change and urbanization be included in an adaptive management program? Other issues to consider include managing large data sets, dealing with externalities, inter-annual variability, temporal-spatial scale and other trade-offs, linking monitoring to models, and population/system level effects.
4. What methods have you found to be effective in synthesizing large amounts of monitoring and research data for timely use by the Project decision-makers?
5. What other logistical challenges have Projects encountered? One particular concern of the PMT is how can the Project ensure rapid management response when it is needed?
6. What methods are effective for including the public in a timely way?
7. Looking to the future, how might monitoring change as the Project progresses?

FIGURE 1. Adaptive Management Staircase: Project Progression through Adaptive Management (MP=percent of managed ponded habitat; ISP=Initial Stewardship Plan)

