

## **Habitat Restoration: Getting Restoration Done and Doing It Right**

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**Summary:** The Delta Stewardship Council has responsibility for overseeing the implementation of the Delta Plan, including its provisions for restoring the Delta ecosystem. To begin its oversight activities, the Council will receive the Delta Independent Science Board's report about the scientific research, monitoring, and assessment programs that support adaptive management of habitat restoration in the Delta (Water Code Section 85820(a)(3)). In addition, staff has requested reports from several agencies about their activities to coordinate Delta restoration activities and restore tidal marshes (Water Code Section 85210(h)).

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### **Background**

The Delta Stewardship Council has responsibility for overseeing the implementation of the Delta Plan, including Delta ecosystem restoration, one of the coequal goals. The Delta Plan addresses five elements of ecosystem restoration:

- Create more natural functional Delta flows
- Restore habitat
- Improve water quality to protect the ecosystem
- Prevent introduction of and manage nonnative species impacts
- Improve hatcheries and harvest management.

This report focuses on the second element, habitat restoration.

At this meeting, the Delta Independent Board's (ISB) Dr. John Wiens will present findings of the ISB's recent report on the scientific research, monitoring, and assessment programs that support adaptive management of Delta habitat restoration. Campbell Ingram, Delta Conservancy Executive Officer and Department of Water Resources' Dennis McEwan will describe their efforts to coordinate agency activities to carry out marsh restoration activities in the Delta. Presenters from three other agencies will describe their actions to restore tidal marshes in Suisun Marsh, Cache Slough, and the western Delta. They are: Steve Chappell, Suisun Resource Conservation District, providing an overview of the Suisun Marsh Plan; DWR's Dennis McEwan describing the Prospect Island restoration project, and DWR's Patty Finrock describing the Dutch Slough restoration project. A final panel of the Delta Science Program's Chris Enright and Department of Fish and Wildlife's Carl Wilcox will offer some thoughts about opportunities and challenges in restoring marshes in the Delta.

Throughout the presentation, the Council is invited to question presenters. At the conclusion of the presentations, all panelists will reconvene to answer further questions or offer their own observations.

## The Council's Framework for Habitat Restoration

The Council's framework for evaluating habitat restoration efforts is the Delta Reform Act and the Delta Plan's ecosystem restoration policies, recommendations and performance measures.

The Delta Reform Act defines restoration as "the application of ecological principles to restore a degraded or fragmented ecosystem and return it to a condition in which its biological and structural components achieve a close approximation of its natural potential, taking into consideration the physical changes that have occurred in the past and the future impact of climate change and sea level rise" (Water Code Section 85066). In other words, we can use our understanding of how habitats supported desirable species the past and how conditions are likely to change in the future to guide restoration.

The main Delta Plan recommendation guiding habitat restoration is **ER R2, Prioritize and Implement Projects that Restore Delta Habitat**. This recommendation identifies the "who, what, where and how" of habitat restoration in the Delta and the Suisun Marsh.

- **Who.** The primary state agencies responsible for habitat restoration are Bay Delta Conservation Plan (BDCP) implementers, Department of Fish and Wildlife (DFW), Department of Water Resources (DWR), and the Delta Conservancy. Local agencies, such as the State and Federal Contractors Water Authority, nonprofits such as The Nature Conservancy, and private businesses including mitigation banks may also play a role, usually acting under permits from state and federal agencies.
- **What.** The recommendation includes specific objectives for each of six priority habitat restoration areas. (See Attachment 1)
- **Where.** The locations of the six priority habitat restoration areas are shown in Figure 4-8 of the Delta Plan. (See Attachment 2)
- **How.** Restoration projects should consider a landscape perspective, improve water quality where possible, and use best practices for controlling mosquitoes. To ensure that habitat restoration achieves desired outcomes as well as outputs, the Council adopted the elements of Delta Plan Policy **G P1, Detailed Findings to Establish Consistency with the Delta Plan** that require the use of best available science and adaptive management.

The Delta Plan provides three performance measures for the Council to use to track progress in implementing ER R2. The first two are measures of *outputs*, or the on-the-ground implementation, while the third is a measure of an *outcome*, or a desired response to management actions.

- **Pilot Projects:** "Pilot-scale Delta habitat restoration projects are developed and initiated in the priority areas described in ER R2 by 2015. These projects include tidal brackish and freshwater marsh as well as floodplain restoration and have clear adaptive management plans aimed at improving outcomes and providing

lessons for the development of large-scale restoration projects. Metrics: acres restored by habitat type, and lessons learned.”

- **Acreage Goals:** “Progress, measured in acres of restored or enhanced habitat, is being made toward the biological opinions’ targets of restoring 8,000 acres of tidal marsh and 10,000 to 20,000 acres of floodplain rearing habitat.”
- **Desirable Species:** “Progress toward the documented occurrence and use of protected and restored habitats and migratory corridors by native resident and migratory Delta species....”

The Delta Plan’s approach to ecosystem restoration builds upon the principles and commitments made by other state and federal agencies. For example, **ER P2, Restore Habitats at Appropriate Elevations**, requires habitat restoration projects to be consistent with DFW’s Ecosystem Restoration Program (ERP) Conservation Strategy. The Delta Plan’s priority habitat restoration areas, described in **ER R2**, are based on both the ERP Conservation Strategy and the restoration opportunity areas identified in draft BDCP documents. The habitat acreage goals described above are derived from the biological opinions of the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) regarding operations of the state and federal water projects. The Delta Plan policy to avoid introductions and habitat improvements that enhance survival and abundance of nonnative invasive species (**ER P5**) is also derived from the ERP Conservation Strategy.

Some of the key questions with respect to carrying out these Delta Plan policies are:

- What is the process for identifying sites and securing them? How long does it take to go from identifying to purchasing a site?
- Are sites being acquired and restoration being planned at a pace that is likely to meet the Delta Plan’s performance measure and the biological opinions’ requirements?
- How effective are the processes for coordinating with affected landowners and local governments during project planning and implementation?
- Is the DFW’s draft *Ecosystem Restoration Program (ERP) Conservation Strategy* providing useful guidance for restoration design?
- Is regulatory compliance a significant barrier to meeting the acreage goals of the biological opinions, either because of cost or schedule?
- What other factors impede restoration of acquired sites?
- How soon will pilot scale projects to test restoration approaches be undertaken in each priority area?

### **Getting Restoration Done and Getting It Done Right**

The Delta Plan clearly calls for getting restoration done by meeting acreage targets for different types of habitat. The Delta Plan also calls for getting restoration done right by using adaptive management to set objectives, employing science-based designs, monitoring performance, and adjusting restoration activities as needed to achieve the project objectives. We care about outputs, like acres of tidal marsh habitat, but we also

care about outcomes, like whether native fish and other species we care about are using the habitat.

We want individual projects to be successful, but we also want the projects to fit together into large patches and corridors. As ER R2 states, we want to “ensure connections between areas being restored and existing habitat areas and other elements of the landscape needed for the full life cycle of the species that will benefit from the restoration project.”

There are many steps (some would say hurdles) to getting restoration done and done right at the project level: acquiring land, designing the project, consulting with neighbors and other stakeholders, obtaining funding and permits, conducting baseline monitoring, constructing the project, mitigating for any adverse environmental impacts, monitoring for permit compliance and project effectiveness, and adjusting the project as needed.

Some of the key questions staff has identified with respect to getting projects done right are:

- How much pre-project monitoring is needed to understand site characteristics, restoration opportunities, and establish a baseline for adaptive management?
- Are regulatory monitoring requirements compatible with or an addition to adaptive management monitoring requirements?
- How long will project implementers conduct monitoring after project is built and who will pay for long-term monitoring? Is a project endowment needed, or should each project be required to contribute to a regional monitoring endowment?

Equally significant are the challenges to getting restoration done and done right at the program level: setting guidelines for land acquisition, determining the timing of project implementation to take advantage of economies of scale (i.e., weighing the tradeoffs between doing smaller projects right away and buying and holding land so that a larger area can be restored all at once), and addressing stakeholder concerns at the policy level.

Some key questions for program level restoration are:

- How does site selection reflect landscape-scale understandings and suitability for adaptive management, e.g., whether a site is well suited to investigations that address key uncertainties?
- How can habitat restoration practitioners work together to create a Delta-wide approach to restoration that helps individual projects make the best possible contribution and learn from each other?
- How is the need to obtain mitigation or types of credits for certain habitat types under regulatory programs helping or harming the efficiency and effectiveness of restoration?

Habitat restoration requires wrestling with policy decisions, as well as practical and scientific concerns. With respect to land use, decision makers face both long-standing

and new challenges. Tidal marsh and floodplain restoration at the regional scale has traditionally run into conflict with existing land uses, such as agriculture or urban uses. To add to the complexity, new conflicts between different habitat restoration visions have emerged. For example, in many areas, the same land is being eyed by different agencies to meet the habitat needs of endangered aquatic species, such as delta smelt and salmonids; endangered terrestrial species, such as Swainson's hawk and giant garter snake; and heritage hunting species, such as waterfowl. There is a growing need for a comprehensive approach to restoration at the landscape scale that provides adequate habitat for all desirable species, whether endangered or culturally important.

### **Science Integration**

**Delta Science Plan.** Delta Plan recommendation **G R1** calls on the Delta Science Program, working with others, to develop a Delta Science Plan that creates an overarching plan for organizing and integrating ongoing scientific research, monitoring, analysis, and data management by December 31, 2013. The first draft Delta Science Plan released in June 2013, includes several actions supporting adaptive management of habitat restoration, including development of landscape-scale conceptual models for each priority restoration area, development of a Restoration Framework to guide adaptive management of Delta ecosystem restoration actions and establishing a team of Adaptive Management Liaisons within the Delta Science Program to assist project proponents.

**Delta Independent Science Board's Habitat Restoration Review.** The Delta Independent Science Board (ISB) is required by the Delta Reform Act to provide oversight of the scientific research, monitoring and assessment programs that support adaptive management of the Delta every four years. The Delta ISB's first review of those activities focused on habitat restoration efforts (Attachment 3). Its report identifies findings and observations grouped under a series of criteria for a successful restoration program: Clear restoration goals, geographic context, extended timescale, adaptive management, monitoring, modeling, coordination of planning and implementation, scientific expertise and stakeholder involvement. The Delta ISB developed four overall recommendations:

- Coordinate and integrate planning and implementation of projects
- Consider climate change and environmental uncertainty in project design
- Prioritize restoration projects
- Coordinate and integrate science to inform and guide restoration actions

### **Regional Coordination**

**Delta Restoration Network.** The Delta Conservancy is taking a lead role in the developing a new Delta Restoration Network, which is intended to coordinate habitat restoration activities in the Delta, helping to ensure that they are designed to meet landscape-level and regional ecological goals, as well as specific project objectives. The Delta Restoration Network brings together restoration project managers, consultants

and Delta community representatives to improve coordination and communication about restoration projects in the Delta.

**Fish Restoration Program Agreement.** The Fish Restoration Program Agreement (FRPA) between the Department of Fish and Wildlife and the Department of Water Resources documents the agencies' commitment to implement several requirements of the biological opinions, with funding to be provided by the state water contractors.

**Suisun Marsh Plan.** The Suisun Marsh Habitat Management, Preservation and Restoration Plan (Suisun Marsh Plan, or SMP) is a 30-year comprehensive plan that addresses habitats and ecological processes, public and private land use, levee system integrity, and water quality through tidal restoration and managed wetland activities. The SMP Adaptive Management Plan calls for the formation of an Adaptive Management Advisory Team (AMAT). The Delta Science Program is supporting the AMAT by working with others to develop a landscape-scale conceptual model for the Suisun Marsh, building upon existing resource specific conceptual models developed for the SMP.

### **Next Steps**

Clearly, much work is underway to integrate science into habitat restoration, coordinate restoration at the regional scale, and get projects done and done right. The staff encourages the Council to provide additional direction about steps to follow-up on today's briefing. Possible steps may include:

- Refer issues needing specific attention to the Implementation Committee;
- Request staff to prepare a white paper summarizing reports and suggesting actions/issues needing attention.
- Make specific recommendations to a local, state or federal agency.

### **List of Attachments**

**Attachment 1:** ER R2, Prioritize and Implement Projects that Restore Delta Habitat

**Attachment 2:** Figure 4-8. Recommended Areas for Prioritization and Implementation of Habitat Restoration Areas

**Attachment 3:** ISB Report: Habitat Restoration in the Sacramento-San Joaquin Delta and Suisun Marsh: A Review of Science Programs

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