

## Endorsement of Issue Paper “Improving Habitats along Delta Levees” and Update on Development of the Delta Levees Investment Strategy

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**Requested Action:** Endorse the issue paper, *Improving Habitats along Delta Levees: A Review of Past Projects and Recommended Next Steps*, which was developed in support of the Delta Levees Investment Strategy (DLIS). Staff has revised the draft version of the paper presented in October 2015 (formerly titled *Levee-Related Habitat Review*) based on Council input and public comment.

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### **Recommendation**

Council staff has prepared a proposed final version of an issue paper about improving habitats along Delta levees and requests that the Council review and endorse the paper. Staff has revised the draft paper presented in October 2015 based on input from the Council, stakeholders, and agency colleagues. If it is endorsed by the Council, the staff will use the paper to provide guidance on improving habitat project siting and ensuring that the effectiveness of habitat projects along Delta levees can be better evaluated in the future.

This report also includes an update, including next steps, on the development of the DLIS, which will inform prioritization of State investments in levee operation, maintenance, and improvements in the Delta in accordance with Water Code section 85306.

### **Background**

Water Code section 85305(a) states that the Delta Plan shall attempt to reduce risks to people, property, and state interests in the Delta by promoting effective emergency preparedness, appropriate land uses, and strategic levee investments. In addition, Water Code section 85306 directs that “the Council, in consultation with the Central Valley Flood Protection Board, shall recommend in the Delta Plan priorities for state investments in levee operation, maintenance, and improvements in the Delta, including both levees that are a part of the State Plan of Flood Control and nonproject levees.”

Council staff and the ARCADIS consulting team have been making progress toward prioritizing State investments in levee operation, maintenance, and improvements in the Delta. This has been the focus of the DLIS, including the development of the draft decision-support tool that was demonstrated for the Council in October.

In addition, in support of the DLIS, Council staff has conducted a review of levee-related habitat improvement projects in the Delta detailing their effectiveness at providing habitat for native species, as well as the costs associated with these types of efforts. Staff presented a draft version of the paper, which had the working title *Levee-Related Habitat Review*, to the Council in October. The draft has been revised based on Council input and public comments received through Nov. 13, 2015.

At the October Council meeting, a question was raised regarding the significance of the recommended next steps in the issue paper and their relationship to the DLIS-related Delta Plan update. This paper is one source of information and suggestions that will be considered when staff develops the proposed Delta Plan amendment. However, because the “Next Steps” are consistent with current policies within the Delta Plan, constructive changes can begin immediately, or in some cases are already underway.

For today’s briefing, staff will: (1) request endorsement of the issue paper, now re-named *Improving Habitats along Delta Levees: A Review of Past Projects and Recommended Next Steps*; and (2) provide an update on the development of the DLIS.

### **Improving Habitats along Delta Levees**

#### **Purpose of the Paper**

The purpose of the issue paper, *Improving Habitats along Delta Levees*, is to explore the question of how to ensure that future State levee investments, which are primarily aimed at flood risk reduction, also contribute to fulfilling two State-level environmental mandates: 1) furthering the coequal goals, particularly with respect to ecosystem restoration; and 2) providing a net benefit for aquatic species in the Delta.

The Council must ensure that the DLIS helps to implement the Delta Reform Act and the Delta Plan. The Delta Reform Act of 2009 established the Council and defined its mission: to further the coequal goals of water supply reliability for California and ecosystem restoration in the Delta, in a manner that protects and enhances the values of the Delta as an evolving place (Water Code section 85054). The Delta Plan includes 14 regulatory policies, including one that calls for levee projects to incorporate habitat benefits where feasible, and another requiring the use of the best available science and adaptive management.

In addition to the Delta Reform Act, other legislative mandates require Delta levee projects to provide habitat improvements. Water Code section 12314(c) instructs the California Department of Fish and Wildlife (DFW) to consider the value of riparian and fisheries habitat along riverine corridors. Water Code sections 12314(d) and 12987(d) require that state-funded Delta Levees Special Flood Control Projects, designed to improve Delta levees, must be consistent with a net long-term habitat improvement program and have a net benefit for aquatic species in the Delta.

*Improving Habitats along Delta Levees* provides a review of past projects, summarizes lessons learned from monitoring reports and through interviews with experts about which habitat designs may provide greater benefits to target native species, and provides guidance to ensure that project effectiveness can be better evaluated in the future. The paper also provides information about the costs of multi-benefit projects that combine levee construction and habitat improvements, the costs of projects that improved habitat along levees but did not involve levee construction, and the cost of habitat mitigation bank credits.

The DLIS team intends to use the paper to inform the development of investment concepts, as a source of cost data related to habitat improvements associated with levee projects, and as a source of recommendations for the Council to consider in its DLIS-related update of the Delta Plan. The Executive Summary has been included as Attachment 1. The full text of the paper is available at <http://deltacouncil.ca.gov/docs/delta-council-meeting-levees-white-paper/improving-habitats-along-delta-levees-review-past>.

### Summary of Analysis

Our review of habitat projects found that the majority of reports used vegetation monitoring as a means of measuring success. Because fish and wildlife monitoring data were not available for most projects and existing data are inconsistent across projects, we were unable to compare the effectiveness of different types of habitat improvement projects. Instead, the paper summarizes lessons learned from monitoring reports and through interviews with experts about which habitat designs may provide greater benefits to target native species.

Similarly, we experienced problems trying to accurately assess the costs of different habitat options associated with multi-benefit levee construction projects. Cost information for the habitat component of levee projects is rarely broken out from the risk reduction component (i.e., levee construction), making it impossible to cleanly parse out and compare costs of different types of habitat improvements. As a result, our analysis presents the total costs of projects (i.e., the cost of not only the habitat component, but also the construction of the flood risk reduction component) broken down broadly into different habitat enhancement project types, such as setback levee projects versus projects involving riparian planting within levee riprap.

Despite our inability to draw firm conclusions regarding the effectiveness of different habitat improvement designs, our review of project monitoring reports did result in some observations regarding effectiveness that can inform the design of future projects. These lessons learned are briefly noted in the Executive Summary and described in greater detail in Appendix 1 of the paper.

### Recommended Next Steps

Based on the findings of the review, we recommend taking several steps to improve project siting and ensure that project effectiveness can be better evaluated in the future:

- 1. Develop appropriate performance measures as part an adaptive management plan.** As required by Delta Plan Policy G P1, habitat improvement projects along levees should have adaptive management plans that include appropriate performance measures, including fish and wildlife response, to assess effectiveness in providing benefits to target species.
- 2. Track the incremental cost of habitat improvements.** The California Department of Water Resources (DWR) has recognized the importance of breaking down the costs of multi-benefit projects into habitat and flood risk

reduction components. The Council supports DWR's proposal to make such a cost breakdown a requirement for receiving grant funding.

3. **Carefully consider the tradeoffs associated with on-site and off-site mitigation.** Destruction of shaded riverine aquatic habitat and emergent vegetation by placement of bank erosion control riprap along key migratory corridors for salmon should be mitigated on-site or at least elsewhere along the same corridor. If habitat is created in areas of the Delta that are not along these corridors, then the mitigation would not be expected to provide the same ecological benefits to salmon. If constraints or other considerations prevent the establishment of habitat mitigation on-site, however, then off-site mitigation may be the best option to mitigate for habitat impacts during levee repairs and rehabilitation, especially if it facilitates the creation of larger and more interconnected habitat patches.
4. **Use landscape-scale planning to guide project location and design.** As landscape-scale restoration planning is conducted in the Delta, as recommended in the Delta Plan, it will provide a framework for siting and designing projects to increase habitat connectivity and function. For example, efforts should be made to link together fragmented patches of habitat to build towards large contiguous habitat corridors.
5. **Measure fish and wildlife response through a standardized regional monitoring program.** By establishing a regional monitoring framework (similar to the DFW-led Interagency Ecological Program Tidal Wetlands Monitoring Project Work Team framework), instead of developing monitoring protocols on a project-by-project basis, it will become easier to compare results across projects and improve understanding of the effectiveness of different habitat improvement options. Regional monitoring also supports program-level adaptive management and a landscape-scale approach, as described above. Additional and long-term funding is needed for this programmatic monitoring.
6. **Use the Delta Levees and Habitat Advisory Committee (DLHAC) to discuss incorporation of effective habitat improvement components into levee projects.** The DLHAC is a regular standing meeting between DWR, CDFW, Delta reclamation districts, and other Delta stakeholders. We envision that the Delta Science Program could become involved with the DLHAC, or a subcommittee thereof, to consult on habitat project siting and design.

None of the recommendations we have made in the paper are novel; in one form or another, they have been previously suggested by other agencies or Delta stakeholders. Implementing them, however, will take leadership, persistence, and adequate long-term funding. Council staff looks forward to working together with our colleagues to address the issues raised in the paper.

#### Changes Made in Response to Comments

We made the following changes to the paper in response to comments received:

- Clarified the Council's position on ensuring that State levee investments contribute to achieving the coequal goals and providing a net benefit for aquatic species in the Delta.
- Changed the title of the paper to make it more descriptive of the contents.
- Provided definitions and illustrations to clarify the differences between setback levees, adjacent levees, and extra-wide levees.
- Upgraded the figures, including better depictions of the vegetation.
- Included a discussion of the U.S. Army Corps of Engineers' vegetation policy, a serious constraint to improving habitats along levees, in the Executive Summary.
- Made numerous minor corrections and clarifications.

### **Delta Levees Investment Strategy Update**

#### **Outreach and Coordination**

On January 13, Council staff and the ARCADIS team had a follow-up meeting with stakeholders to provide an update of recent DLIS activities and to discuss the methodology used by the decision-support tool and expected activities for 2016.

#### **Response to Independent Scientific Review Panel (Panel) Report**

Council staff and the ARCADIS team, along with key partner agencies such as DWR, have been reviewing the recommendations made by the Panel. Our goal is agreement on how best to address the Panel's recommendations using available information and within the time and scope of the project. Recent discussions with DWR have yielded a path forward in finalizing the methodology allowing us to move into the next phases of the DLIS project, as detailed below.

### **Next Steps**

#### **DLIS Development**

In the coming months, Council staff will undertake the following activities:

- Finalize methodology in response to the independent scientific review panel's recommendations
- Demonstrate the decision-support tool to focus groups and the public
- Develop a list of Delta islands/tracts ranked by risk for Council consideration and approval. This list will form the basis for developing alternative levee investment concepts.
- Develop levee improvement investment concepts (e.g., increased height/width improvements, set-back levees and other "green" improvements, etc.), through an interactive process with stakeholder groups (e.g., flood management experts, water users, environmental groups, and others). Information will be used to

assess and rank alternative investment concepts' effectiveness in reducing risks to key Delta assets.

Staff will present alternative investment portfolios, evaluated in part using the decision-support tool, to the Council and stakeholders. These investment portfolios will inform in-depth discussion and deliberations regarding overall risk-reduction, cost-effectiveness and tradeoffs. Results of these discussions and subsequent Council guidance on preferred investment portfolios will inform a draft investment strategy and alternatives, including a preferred alternative, to review in the draft Environmental Impact Report.

A joint DLIS workshop with the Central Valley Flood Protection Board and a detailed DLIS project briefing for the California Water Commission are in the planning process and will occur by mid-2016.

#### Non-Structural Alternatives

Staff continues to follow up with State and local emergency managers to gather information on non-structural flood risk reduction measures, including comparisons of the cost and risk reduction potential of these alternatives with more traditional levee investments. This includes coordinating with county flood management staff who are responsible for National Flood Insurance Program (NFIP) implementation to determine how encouraging nonstructural measures tracked by the NFIP's Community Rating System could reduce flood insurance rates for Delta communities.

#### List of Attachments

Attachment 1: Improving Habitats along Delta Levees; Executive Summary  
Attachment 2: DLIS Project Schedule

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