

**DELTA SCIENCE PROGRAM  
INDEPENDENT SCIENCE REVIEW  
Bay-Delta Conservation Plan Effects Analysis  
Conceptual Foundation and Analytical Framework and Technical  
Appendices**

**SCOPE AND CHARGE TO REVIEWERS**

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**BACKGROUND**

The Bay Delta Conservation Plan (BDCP) is being prepared by the California Department of Water Resources and a group of water agencies, with the cooperation of state and federal agencies, and other interest groups. The BDCP is being developed to satisfy the Federal Endangered Species Act (ESA) and the California Natural Community Conservation Planning Act (NCCPA). When complete, the BDCP will provide the basis for issuing ESA and NCCPA permits for operations of the state and federal water projects. The plan would be implemented over 50 years. The BDCP Planning Agreement has the following planning goals:

- Provide for the conservation and management of Covered Species within the Planning Area;
- Preserve, restore and enhance aquatic, riparian and associated terrestrial natural communities and ecosystems that support Covered Species within the Planning Areas through conservation partnerships;
- Allow for projects to proceed that restore and protect water supply, water quality, and ecosystem health within a stable regulatory framework;
- Provide a means to implement Covered Activities in a manner that complies with applicable State and federal fish and wildlife protection and laws, including CESA and FESA, and other environmental laws, including CEQA and NEPA;
- Provide a basis for permits necessary to lawfully take Covered Species;
- Provide a comprehensive means to coordinate and standardize mitigation and compensation requirements for Covered Activities within the Planning Area;
- Provide a less costly, more efficient project review process which results in greater conservation values than project-by-project, species-by-species review; and
- Provide clear expectations and regulatory assurances regarding Covered Activities occurring within the Planning Area.

The BDCP Working Draft was released November 18, 2010 without a detailed effects analysis. The effects analysis, a critical component for the BDCP, is intended to provide the best scientific assessment of the likely effects of BDCP actions on the species of concern, and ecological processes of the Bay-Delta system. The effects analysis will, out of necessity, rely heavily on the application of models to quantify the likely results of the plan. These will include conceptual, numerical, hydrodynamic, operational, and species models. The BDCP effects analysis is being conducted and documented through a series of technical appendices centered around common stressors or groups of similar effects. The first appendix, Conceptual Foundation and Analytical Framework (Foundation and Framework), describes the high-level vision, purpose, and regulatory foundation for the effects analysis. It also provides an overview of the proposed methods to accomplish the analysis. The next

technical appendices are as follows (the title or specific content of each appendix may change):

- **Entrainment.** A synthesis of the relevant analyses related to entrainment of the covered fish.
- **Flow, Passage, Temperature, and Salinity.** A synthesis of the effects of BDCP actions on flow in the Delta and effects, in turn, on fish passage, salinity, turbidity, dissolved oxygen, and temperature.
- **Toxics.** A synthesis of the effects related to metals and pesticides.
- **Habitat Restoration.** An analysis of the potential effects of the proposed habitat restoration on physical parameters that, in turn, affect covered fish.
- **Ecological Effects.** An assessment of biological factors that affect the ecosystem that are not specific to covered fish, including predation, food supply, and submerged aquatic vegetation.
- **Fish Population Analysis.** A “roll-up” of the effects described in all of the previous appendices to describe the overall effects of BDCP on species and populations.
- **Terrestrial Species.** An assessment of the effects of BDCP action on all of the non-fish covered species and associated natural communities.
- **Analyses Not Used.** A summary of the methods used in earlier versions of the effects analysis or used during the current effort, but not retained in BDCP, and why.

The first phase of the review will cover the Foundation and Framework and the Entrainment Appendix. The second phase of the review will cover the BDCP chapter that summarizes the effects analyses and the remaining technical appendices.

## **INDEPENDENT SCIENCE REVIEW PANEL**

The BDCP participants have requested an initial independent scientific review of 1) the draft Foundation and Framework, and 2) the Entrainment Technical Appendix to assess their scientific soundness. An Independent Science Review Panel (Panel) will initially convene to review the Foundation and Framework to ensure it is of sufficient robustness and scientific quality to serve its intended purposes, and will review the Entrainment Technical Appendix as an example of the application of the conceptual understanding, methods and analyses discussed in the Foundation and Framework.

The BDCP participants also envision that the Panel will reconvene on occasion to evaluate the results of the Foundation and Framework for covered terrestrial and aquatic species. BDCP participants expect that a scientifically sound and feasible Foundation and Framework will enable an assessment of the likely effects of BDCP water management and ecosystem restoration conservation measures. At a subsequent meeting, the Panel will likely assess how well the Foundation and Framework performed in achieving its goals and objectives.

## **CONCEPTUAL FOUNDATION AND ANALYTICAL FRAMEWORK PURPOSE AND SCOPE**

A conceptual foundation is a set of scientific theories, principles, and assumptions that describe how an ecosystem functions. The conceptual foundation determines how information is interpreted, what problems are identified, and as a consequence, the range of appropriate solutions. For the BDCP, the conceptual foundation is the scientific outline of the biological effects analysis that guides how the analysis is organized and displayed. The Analytical Framework describes the general methodology and structure of the analysis of the effects of the BDCP on the covered aquatic species. The purpose of the Analytical Framework is to provide a general scheme and logic for the effects analysis. Major tools and models that are likely to be used in the analysis are discussed; additional tools and detailed methodologies will be discussed in each appendix relating to a stressor category. The intent of the Analytical Framework is to lay out a general approach to the analysis of the effects of BDCP actions.

## **REVIEW MATERIALS**

- Working Draft Conceptual Foundation and Analytical Framework Appendix
- Working Draft Entrainment Technical Appendix

## **SUPPORTING INFORMATION**

- Highlights of the BDCP (December 2010)  
([http://resources.ca.gov/docs/Highlights\\_of\\_the\\_BDCP\\_FINAL\\_12-14-10\\_2361.pdf](http://resources.ca.gov/docs/Highlights_of_the_BDCP_FINAL_12-14-10_2361.pdf))
- BDCP Working Draft (2010)  
([http://baydeltaconservationplan.com/BDCPPlanningProcess/ReadDraftPlan/ReadDraftPlan\\_copy1.aspx](http://baydeltaconservationplan.com/BDCPPlanningProcess/ReadDraftPlan/ReadDraftPlan_copy1.aspx))
- NRC 2011 Panel Report - A Review of the Use of Science and Adaptive Management In California's Draft Bay Delta Conservation Plan  
([http://www.nap.edu/openbook.php?record\\_id=13148&page=33](http://www.nap.edu/openbook.php?record_id=13148&page=33))
- Science Advisors Draft Report on BDCP Goals and Objectives for Covered Fish Species  
([http://baydeltaconservationplan.com/Libraries/2011\\_Working\\_Groups/6-16-11\\_Draft\\_Final\\_BDCP\\_G\\_O\\_Science\\_Advisors\\_Report.sflb.ashx](http://baydeltaconservationplan.com/Libraries/2011_Working_Groups/6-16-11_Draft_Final_BDCP_G_O_Science_Advisors_Report.sflb.ashx))
- Regulatory Framework for the BDCP Effects Analysis Relating to Species and Habitat Covered by the Plan and Incidental Take Permits

## **TIMELINE**

### **October 2011**

The Panel convenes in Sacramento to discuss the Foundation and Framework and Entrainment Technical Appendix and to make initial recommendations.

### **November 2011**

Panel report completed.

### **March 2012**

The Panel reconvenes in Sacramento to discuss both the BDCP chapter that summarizes the effects analysis and the remaining technical appendices.

## REVIEW PANEL CHARGE

The Panel will be charged with assessing the scientific quality of the Foundation and Framework and the Entrainment Appendix. The Panel will make recommendations for how these might be improved with respect to achieving their stated goals. Specific attention will be applied to the following questions:

### *Conceptual Foundation and Analytical Framework*

1. How well are the purpose and scope of the Foundation and Framework defined and described?
2. How well will the Foundation and Framework, as designed, meet its major goals?
3. How effectively does the Foundation and Framework describe the key elements of the ecological context of the BDCP? (details of the ecological context are found in Chapter 2 of the plan)
4. Are the Foundation and Framework internally consistent and scientifically valid?
5. How well does the Foundation and Framework provide an approach for analyzing the effects of BDCP?
6. Does the Foundation and Framework adequately describe how quantitative and conceptual models will be used? Is the approach integrated, reasonable and scientifically defensible?
7. How well is the approach to analyze individual covered activities, including all conservation measures, as well as the cumulative impacts of a comprehensive strategy described?
8. How well does the proposed Framework integrate analysis at various spatial and temporal scales?
9. How well does the Foundation and Framework articulate how best available science will be defined, assembled, summarized and integrated into the analysis?
10. How clearly does the Foundation and Framework identify baseline(s) or other reference points (e.g., goals and objectives) for the effects analysis?
11. How well does the Foundation and Framework describe how uncertainty will be addressed? How could it be improved?
12. How well does the Foundation and Framework describe the link between the adaptive management and the associated monitoring program and the effects analysis?
13. Does the Foundation and Framework describe the appropriate suite of models that should be used?
14. How well does the Foundation and Framework describe how conflicting model results and analyses will be interpreted in the technical appendices?
15. How complete is the Foundation and Framework; how clearly is it described?
16. How well are the methods described to synthesize effects at the species, population, and ecosystem levels? (Note: The description of the “roll-up” methods are still in development and will not be included in the Framework in time for this review. Additional details may be provided during the consultant presentation at the first workshop.)

1. How well are the proposed analytical tools defined, discussed and integrated?
2. How clear and reasonable is the scale of analysis?
3. How well are the models and analyses interpreted and summarized?
4. How well was the vision of the Foundation and Framework applied in the technical appendix/analysis (i.e., the Entrainment Appendix)? How consistently was it applied?
5. How well did the technical appendix evaluate the effects of potential BDCP conservation measures on the specified variable(s)?
6. Were the appropriate models used in the technical appendix? Were model results interpreted correctly? If model results conflicted, were appropriate interpretations made?
7. How rigorous of an analysis did the technical appendix provide for evaluating the effects of potential BDCP conservation measures on the specified variable(s)?
8. Were the conclusions drawn from the results accurate and did these conclusions appropriately consider scientific uncertainty?