PANEL REVIEW OF THE DRAFT BAY DELTA CONSERVATION PLAN:

PREPARED FOR THE NATURE CONSERVANCY AND AMERICAN RIVERS

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Preface

The Bay-Delta Conservation Plan is more than 15,000 pages long and covers a wide range of issues ranging from water supply, new facility construction, aquatic and terrestrial ecosystem management, governance and costs. Few outside of the handful of people deeply involved in BDCP actually know what is in the document due to its imposing size. This is particularly true for the various stakeholder groups who lack either the staff or the technical capacity to review the document and to evaluate the complex analyses that underpin it.

With support from the S.D. Bechtel, Jr. Foundation's Water Program, Saracino & Mount, LLC, was asked to assemble a panel of independent experts to review portions of the Plan to help guide decision-making by two non-governmental organizations: The Nature Conservancy and American Rivers. Guided by a narrow set of questions about how the Plan would impact water supply and endangered fishes, the panel reviewed the Plan documents and conducted analyses of data provided by the project consultants. The following document is a summary of our results.

It is important that this analysis not be over-interpreted. We do not endorse or reject the Plan. We only assess effectiveness of various conservation measures, guided by narrowly targeted questions. In addition, we make a handful of modest proposals to improve the performance of the Plan, particularly for issues of concern to the two non-governmental organizations. Thus, the scope of this review is quite limited.

The authors wish to thank the S.D. Bechtel, Jr. Foundation for its generous support. The staff of The Nature Conservancy and American Rivers provided abundant time and energy as we scoped this review. Jennifer Pierre, Armin Munevar, Chandra Chillmakuri, and Laura King-Moon provided voluminous data, answered our many questions and addressed our concerns. Spreck Rosecrans and Drs. Peter Moyle and Jay Lund provided comment on portions of the manuscript, although their comments do not constitute formal peer review. All errors of omission or commission are our own.

Jeff Mount, Panel Chair

Executive Summary

Two non-governmental organizations, The Nature Conservancy (TNC) and American Rivers (AR), are evaluating their options for engagement with the Bay Delta Conservation Plan (BDCP). If approved, the Plan would become a Habitat Conservation Plan (HCP) under the federal Endangered Species Act and a Natural Communities Conservation Plan (NCCP) under California law. The purpose of the Plan is to allow for construction of new water diversion facilities in the Sacramento-San Joaquin Delta while also protecting aquatic and terrestrial species that may be adversely affected by the project and accompanying changes in the State Water Project (SWP) and Central Valley Project (CVP) operations. The Plan also includes habitat restoration and a commitment to assist in the conservation and recovery of species that are listed for protection under the federal and state Endangered Species Acts.

With financial support from the S.D. Bechtel, Jr. Foundation, Saracino and Mount, LLC, convened an independent panel of experts, with technical support from NewFields, Inc., to evaluate portions of the Plan. The panel, working jointly with TNC and AR, developed a series of technical and legal questions about the Plan. This report provides answers to these questions, along with limited recommendations on how to improve BDCP.

To simplify analysis, this review focuses on conditions for federally listed fishes during the Early Long Term (ELT), a decade after a permit would be issued (approximately year 2025). These are described in detail in the BDCP Effects Analysis and accompanying Environmental Impact Statement/Environmental Impact Report. We compared the performance of three different scenarios: a No Action Alternative (NAA) where no new North Delta diversion facility is constructed, a High Outflow Scenario (HOS) where the facilities are operated in a way that allows for occasional high spring and fall outflows, and a Low Outflow Scenario (LOS) with lower spring and fall outflows. The review also emphasizes in-Delta and Sacramento River watershed conditions during the ELT, with less attention to San Joaquin River conditions and fishes.

Although multiple data sources were used in this analysis, most hydrologic data came from CALSIM simulations conducted by BDCP consultants. The Panel strongly cautions about the conclusions drawn from these simulations. Flow simulations have three compounding uncertainties that can lead to significant error: (1) uncertainty in system understanding and future conditions, (2) model uncertainties (particularly the relationships between 1-, 2-, and 3-dimensional models), and (3) behavioral/regulatory uncertainty where the models cannot capture the scope of human behavior in operating the projects under various conditions. These uncertainties, which are not described in BDCP documents well, makes all of our conclusions contingent on the projects *actually being operated as simulated.*

Do Operations Shift Delta Exports from Dry to Wet Years?

The BDCP calls for increasing exports in wet years and reducing them in dry years, taking advantage of the increased operational flexibility provided by two points of diversion. This would reduce stress on Delta ecosystems during drier periods. Our analysis of simulation data suggests that while there is some increase in flexibility, export operations are highly constrained by upstream consumptive uses, regulations that cover reservoir operations, and flow and water quality standards. This greatly limits the anticipated benefit associated with operation of the dual facilities. Despite these limitations, as modeled, there is an increase in exports in wet years. In most dry years there are no substantial changes over NAA conditions. However, significant improvements in outflow and Old and Middle River (OMR) conditions occur in some dry years. We were unable to identify the regulatory or operational requirements that would lead to this.

Are Impacts of the North Delta Facility Fully Assessed and Mitigated?

The Plan identifies multiple near- and far-field effects of the new North Delta facility. Based on our review of the Effects Analysis, the Plan appears to have properly identified the most significant effects and uses standard models to assess them. Outmigrating juvenile winter-run and spring-run Chinook salmon will be most heavily affected, leading, in the absence of mitigation, to significant losses. The Plan identifies multiple mitigation strategies, including pulse flow management, predator control, entrainment reduction, non-physical barriers, real-time operations and development of alternative migration pathways (Yolo Bypass). With the exception of benefits from diverting juveniles onto the Yolo Bypass, all of these mitigation approaches have high uncertainties. Done well and successfully, however, they appear to offset the losses associated with operation of the North Delta facility. The HOS appears most protective of conditions upstream of the Delta and adjacent to the new facility. However, mitigation actions are unlikely to contribute significantly to recovery of these species. Additionally, successful mitigation is likely to occur only if there is a robust adaptive management and real-time operations program. The Plan provides neither.

Are In-Delta Conditions Significantly Improved for Smelt?

We evaluated the modeling results in the Plan and conducted our own modeling to evaluate how changes in conditions would affect delta and longfin smelt. As noted, we are concerned that anomalously positive (or less negative) OMR flows and high Delta outflows that are modeled during some drier years would not actually occur in real operations. However, if these changes were to occur we find modest to significant improvement in in-Delta conditions for smelt, particularly delta smelt. Improvements in OMR flows under HOS and LOS result in substantial decreases in entrainment, leading to significant increases in long-term survival percentages for delta smelt. However, increases in spring and fall outflow under HOS lead to small increases in longfin smelt abundance and modest improvements in delta smelt recruitment.

Will Pelagic Fishes Benefit from Floodplain and Tidal Marsh Restoration?

The Plan properly identifies food limitation as a significant stressor on smelt populations in the Delta. The Plan proposes to address this issue by restoring physical habitat to help subsidize pelagic food webs. Based on simple modeling and comparison with other systems,

we find that restored floodplains and tidal marshes are unlikely to make a significant contribution to smelt rearing habitat conditions. Tidal marshes can be sinks or sources of food, with most appearing to be sinks for zooplankton. The Plan appears to be too optimistic about the benefits of tidal marsh and floodplain restoration. However, there is likely to be benefit where fishes have direct access to productivity, such as in Cache Slough. In addition, although benefits for listed pelagic fishes are low, there are broad benefits of restoration for many aquatic and terrestrial species covered by the Plan.

Does the Plan Provide an Effective Governance Structure?

We reviewed the proposed BDCP governance structure to evaluate its likely effectiveness in meeting the Plan's goals and objectives. Implementation of BDCP would be overseen by an Authorized Entity Group (AEG) comprising the California Department of Water Resources (DWR), the U.S. Bureau of Reclamation (USBR), and the state and federal water contractors if they are issued incidental take permits pursuant to the BDCP. A Permit Oversight Group (POG), consisting of the U.S. Fish and Wildlife Service (USFS), the National Marine Fisheries Service (NMFS), and the California Department of Fish and Wildlife (CDFW), would monitor implementation of the Plan and compliance with the biological objectives and conservation requirements. The draft BDCP includes a 50-year "no surprises" guarantee, as well as other regulatory assurances. We found that, when examined in detail, the draft BDCP blurs the lines between implementation and regulation and grants the permittees unusual decision authority. Additionally, the regulatory assurances in the Plan, especially the "no-surprises" policy, place undue financial responsibilities on the state and federal governments if certain modifications to the Plan become necessary during its 50-year term. Given the complexity of the Delta ecosystem, predicted changes in hydrology, anticipated changes in the Delta not included in the Plan, and significant scientific uncertainties, Plan modifications are likely to be needed in the future.

Is There a Robust Science and Adaptive Management Plan for BDCP?

The Plan is committed to adaptive management in order to address the high uncertainties. Most of the unresolved issues in the Plan are to be resolved at a future date through adaptive management. A "decision tree" approach is proposed to resolve conflicts over starting operations. We found that the governance structure, whereby the AEG may exercise veto authority over changes to the biological objectives and conservation measures, is likely to create disincentives for adaptive management. In addition, a proposed consensus-based Adaptive Management Team made up of POG, AEG, and scientific community members creates conflicting relationships between decision-makers and providers of key information. The limited information available about the science program suggests that BDCP proposes to develop a wholly new science program that is not integrated, but should be, with existing programs. Finally, our review of the "decision tree" process indicates that it is unlikely to achieve the goal of significantly reducing uncertainties before the North Delta facility is constructed and ready for operation.

Recommendations

Based on answers to these six questions, the Panel formulated a list of nine recommendations for improving BDCP.

- All parties need to recognize the model uncertainties in BDCP and factor that into decision-making. It is unlikely that actual operations will follow simulated operations.
- Given the high uncertainty over mitigation for the North Delta facility, all mitigation efforts should be in-place and tested *before* the facility is completed. This includes completion of the Fremont Weir modifications on the Yolo Bypass as well as large scale, significant experiments in real-time flow management, predator control and non-physical barriers.
- The improvements in long-term survival percentages for delta smelt in response to changes in OMR need to be more rigorously evaluated, particularly in light of uncertainties over operations. If further examination supports these findings, operational rules should be developed that insure that the anomalous, significantly improved drier-period OMR and outflow conditions occur.
- The limited benefit derived from changes in outflow under HOS requires a second look at options for significant increases in outflow, including finding sources of water outside the direct control of BDCP.
- Although we find that marsh and floodplain restoration is unlikely to create the benefits for pelagic fishes described in the Plan, this can only be resolved through experimental restoration projects. These projects need to be designed and implemented rapidly to resolve this issue.
- Substantial revision of BDCP's governance structure is needed. This includes giving full regulatory authority to the POG, while limiting their involvement in implementation.
- To address high uncertainties about project performance and future conditions, instead of a 50-year permit, there should be renewable "no surprises" guarantees issued every ten years based on conditions at the time and prior performance.
- An adaptive management program needs to be developed that has the capacity and authority to conduct adaptive management experiments and effectively use outcomes to revise and improve future actions..
- A well-funded BDCP science program needs to be developed that is integrated with existing Delta science programs. The best opportunity for integration lies with the current efforts to update the Delta Science Program.