July 29, 2014

BDCP Comments
Ryan Wulff, NMFS
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

RE: Bay Delta Conservation Plan Comments – The Nature Conservancy

Dear Mr. Wulff,

As both a conservation organization and a Delta land owner, The Nature Conservancy (TNC) has been actively engaged in the Delta for many years to advance the recovery of endangered species, restore and preserve multiple types of habitat, and seeking to apply sound science and practical solutions that work for nature and people. As a conservation organization, our comments focus on the ability to achieve the conservation and recovery goals outlined in the Bay Delta Conservation Plan (BDCP).

As a starting-point, we do believe that a BDCP could contribute to a larger Delta and Sacramento-San Joaquin River conservation and sustainable water management effort. However, if the project is implemented as proposed in the current BDCP, we have serious concerns that the BDCP will fail in meeting its defined conservation goals and objectives, and could undermine existing conservation values and legal responsibilities we hold as the land owner of Staten Island.

Our comments are based on scientific analysis that we have been directly involved in, our own conservation efforts in the Delta, and wider dialogues in the Delta and its tributaries about how to achieve sustainable water management and recovery of threatened and endangered species. Additionally, as a member of the Migratory Bird Conservation Partnership, TNC has also commented on particular aspects of the BDCP that may impact migratory birds, and those comments are referenced here. In particular, we believe that BDCP should improve habitat conditions for migratory birds and enhance predictable deliveries of water to California refuges. Overall, our analysis points to significant scientific uncertainty about how to achieve the BDCP conservation goals, and the need for conservation strategies and programs that are flexibly designed to better meet the challenges of climate change.

The Sacramento-San Joaquin River Delta is the hub of the California water system. We support the dual goals of restoring the Delta estuary and upstream habitats while reducing reliance on the Delta as the source of California’s water supply needs. However, the current plan raises significant concerns about the adequacy and ability of BDCP to provide necessary flows for habitat, responsibilities for implementation of conservation measures, and we encourage you to consider the following in implementing changes that would enhance likelihood of success:
• **Effective Adaptive Management:** It is going to take at least 10 years for the project to be built, and even longer to determine the effectiveness of many of the proposed conservation measures. Given the level of scientific uncertainty about the effectiveness of conservation measures, the success or failure of the BDCP will be determined on the basis of effective adaptive management. This approach will be essential to build the information base, reduce uncertainty, and increase confidence and support that restoration actions will lead to recovery of threatened and endangered species in the Delta. Direct experimentation with proposed restoration activities and flow modifications should begin early in order to ensure that long-term investments in habitat can be measured in relation to the recovery of threatened and endangered species in the Delta.

• **Habitat Restoration Alone is Not Enough:** Creating a mosaic of restored habitats in the Delta will not alone be sufficient to achieve intended recovery objectives. Measures of success also should be based on restoring ecosystem functionality, and will require sufficient dedicated flows to ensure positive outcomes for multiple species and habitat types, and contribute to the recovery of affected species consistent with the Natural Community Conservation Planning (NCCP) Act. The application of scientific platforms such as TNC’s Ecological Flow Tool (EFT) will be essential in driving experimentation, monitoring, and modifying conservation strategies that can help recover multiple affected species.

• **Need to Assure Adequate Flows:** Water flows must begin at a sufficient baseline level to achieve conservation outcomes and have enough flexibility to meet the needs of the environment and appropriate levels of export. The BDCP lacks sufficient information to determine whether and how adequate flows will be provided within proposed project operations. From an adaptive management perspective, even beginning at the high outflow scenario (HOS) may not be sufficient to meet recovery objectives, and there are significant questions about the ability to increase necessary outflows, and the corresponding responsibility that water contractors have to achieve those flows. If the BDCP and the Implementing Agreement require reopening the permitting process for any future adjustments to flows, it could be a fatal flaw of the plan. Ultimately, the system needs to be operated in a way that reduces exports in dry years, compensating by increases in exports in wet years, and ensuring more variability in flows critical to the diverse needs of the system.

• **Commitment to Implement Conservation Measures:** The roles and responsibilities for actually implementing habitat programs and projects beyond CM1 are not clearly defined, so there is really no guarantee that conservation actions will occur on a timely basis. The lack of clarity in implementing conservation measures creates potentially open-ended obligations among parties beyond the water contractors, and it is necessary to clearly define responsibility for implementation of conservation measures. While we recognize that the BDCP alone isn’t going to recover all listed species, a successful BDCP has to assign a proportionate and fair responsibility for recovery to the state and federal water contractors that are exporting water from the Delta.

• **Tunnel Siting, Construction and Operation Impacts on Staten Island Must Be Addressed:** We agree that some new conveyance mechanism should ultimately be part of a holistic conservation approach to restoring the Delta. However, among other considerations, the current BDCP tunnels would bisect Staten Island, which is important for the preservation of Greater Sandhill Cranes on the Pacific coast. TNC has led integrated conservation efforts in wildlife-friendly farming practices on the island for more than a decade, and the minimal habitat enhancement measures proposed in the EIR/EIS as mitigation on
Staten Island are potentially insufficient to offset severe and potentially long-term effects of construction activities, and other land disturbance on the island. The only way to ensure no net loss of important habitat function for cranes and other migratory birds on Staten Island would be to relocate all BDCP conveyance and construction activities away from the island.

All Californians have a stake in the health of the Delta. The Nature Conservancy endorses wider statewide integration of water management such as the Governor’s Water Action Plan for the long-term benefit of people, agriculture and wildlife. In that context, the BDCP, operated with clear prioritization of conservation actions consistent with California’s NCCP Act could provide an important element of a sustainable statewide water management strategy.

It is our hope that comments prepared by TNC and many other parties on the BDCP can inform new approaches to project operations, integrated conservation efforts, adaptive management, and more directly link the BDCP with sustainable water management strategies. We must make decisions now to ensure we have enough water for future generations. And it all starts in the Delta.

Sincerely,

Mike Sweeney
Executive Director
The Nature Conservancy, California

Attachments

The attached set of comments explains each of these issues and the science behind it in more detail. If you have questions about these comments, please contact Jay Ziegler at The Nature Conservancy at 916-449-2857 or jay_ziegler@tnc.org.
The Nature Conservancy

Comments on the Draft Bay Delta Conservation Plan and Accompanying Draft EIR/EIS

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Section I - Broad and Overarching Concerns with BDCP

A. Introduction

The Nature Conservancy (TNC) has been actively engaged in the Bay Delta Conservation Plan (BDCP or Plan) process for the past eight years. TNC is both a conservation organization and a landowner with an active portfolio of conservation programs encompassing multiple Delta and upstream habitat types. As a conservation organization we are alarmed by the continuing collapse of the Delta ecosystem amid multiple threats and what this will mean for the diversity and resiliency of the Delta. These threats include insufficient and radically altered flows, climate change, declining water quality, and a continual loss of the meager remains of marsh, riparian and wetland habitat. In addition, as a Delta landowner we recognize the complexity of habitat restoration in the context of multiple and sometimes competing objectives.

Without a plan in place that is operationally integrated, ecosystem-wide, that incorporates as truly robust and flexible “adaptive management” framework designed to achieve recovery of listed species, we believe a slow, but continuous deterioration of the Delta ecosystem and its native biodiversity, is inevitable. Recognizing that the collapse of the Delta ecosystem will have detrimental impacts to California’s economy, the overall resilience of the Delta, and even current agricultural, recreation and habitat values, TNC strongly endorses the expressed goals of the Bay Delta Conservation Plan to find a sustainable balance between water supply reliability and a functioning ecosystem.

However, for the Bay Delta Conservation Plan to succeed, the framework of the existing conservation plan must be substantially modified in the following ways:

1. A significant portion of the habitats lost over the past 150 years must be restored, but targets and measures of success should be approached on the basis of restoring ecosystem functionality – not only acreage targets;

2. There must be a concurrent effort to restore more natural water flows into the Delta to support that habitat;
3. The BDCP must incorporate an effective governance structure that is informed by transparent science, well-funded and directed by an independent governing body, that is functionally able to implement modified habitat and flow measures as new knowledge is gained through implementation; and

4. The BDCP must define clear and proportional responsibility that ultimately meets the recovery standard of the Natural Communities Conservation Program (NCCP) Act, the BDCP must be integrated into comprehensive Sacramento-San Joaquin Rivers and Delta conservation programs\(^1\) including the recently released Central Valley Recovery Plan (National Marine Fisheries Service and Department of Fish & Wildlife).

A fundamental reality that must be recognized in the BDCP is that due the continued sharp decline of multiple aquatic species in the Delta, the proposed new conveyance (e.g. twin tunnels project) is likely to be operated to meet the existing “avoidance of jeopardy” standard for the foreseeable future. However, to satisfy NCCP requirements, to qualify public investment consistent with current legal requirements, and to mobilize support for long-term conservation actions, the BDCP must plausibly result in recovery of species as required under the NCCP. The BDCP must also result in much improved ecosystem function of the Delta consistent with the coequal goals of the Delta Reform Act (2009). A BDCP which never escapes the edge of jeopardy rulings as a long term strategy is unacceptable and should be rejected. Unfortunately, it is our assessment that the current BDCP proposals are not likely to escape a scenario of continued of jeopardy rulings and amid degradation of Delta ecosystem function.

It is also important to recognize that conservation actions of the scale proposed in the BDCP may take decades to have measurable impacts and actually result in recovery of the species. We acknowledge this – even by a standard that recognizes the BDCP and associated actions by

the project proponents (e.g., the State and federal water contractors) bear a proportional burden of the recovery effort (Mount et al. 2013).

B. The Once-Vibrant Delta is on the Brink of Collapse

Historically, the Delta estuary as a whole has been a highly productive ecosystem, producing millions of metric tons of fish and shellfish, with its vast food web supporting a rich variety of marine and freshwater wildlife. At one time, the four runs of salmon that pass through the Delta alone numbered in the millions annually. The water quality of the Delta is naturally influenced by inflows of fresh water and tidally-driven mixing of seawater from the west with freshwater inflows. This mingling of fresh and salt water in the Delta creates an ecosystem unique for its size and diversity of species — roughly 738,000 acres support more than 750 species of plants and animals, some of which, like the Delta smelt, are unique only to the Delta. Over 50 different species of fish and 380 animal species, mostly birds, call the Delta home.

In addition to still being the gateway for hundreds of thousands of salmon and steelhead that spawn in the streams of the Central Valley and Sierra, the Delta is a critical link in the Pacific Flyway for migratory birds (Herbold and Moyle 1989). It should be noted that physical changes in the Delta, the availability of water and agricultural practices have attracted some wildlife in greater abundance today, underscoring the importance of wildlife-friendly farming practices as part of the Delta’s future. This also underscores the importance of enhancing freshwater marsh habitat around the Delta as part of the BDCP strategy to preserve and expand habitat for migratory birds.

Today’s radically altered Delta ecosystem has just a fraction of wetland and river habitat, converted to farmland and housing developments, and what remains is compromised by reduced connectivity, water supply operations, invasive species and pollution. In particular, the

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2 The State and federal water contractors are referred to collectively as the “water contractors.”
systematic ‘de-linking’ of land and water in the Delta, converting marsh habitat into a series of islands separated by well-channelized waterways has fundamentally altered the natural landscape of the Delta. With these factors in mind, many scientists have warned that a catastrophic crash of the Delta’s food web is likely and may already be occurring (Lund et al. 2007).

Over the decades, water quality in the Delta has been heavily influenced by human activity well above the Delta. Managing flows for multiple purposes while meeting water quality standards and export pumping needs has significantly altered Delta salinity patterns. The Delta is a naturally dynamic ecosystem, with natural daily and seasonal shifts in salinity that are important for maintaining its native diversity. However, direct exports and upstream diversions have significantly altered these patterns so that at times, waters of the western Delta are either fresher or more saline than they would be under more natural conditions. In addition, the operation of the massive State Water Project and Central Valley Project pumps in the south Delta routinely alter the natural flow pattern through the Delta. Water quality in the Delta will continue to be influenced by these factors, and also change substantially with sea level rise, permanent island failures, and changes in water and land management.

Pressures on the Delta associated with sea level rise, climate change, earthquakes, land subsidence, and flooding will ultimately make water exports from the Delta impractical, if not impossible with the current physical configuration of the Delta. The California Department of Water Resources (DWR) has estimated that a disruption of water exports from the Delta caused by flooding due to major levee failures could amount to a $30-to-$40 billion loss to the state’s economy (DWR 2009). A study and report released by the Public Policy Institute of California (PPIC) in 2007, and since updated, has concluded that an isolated conveyance system offers the best potential for meeting the co-equal objectives of Delta ecosystem recovery and water supply reliability (Lund et al. 2007).

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5 http://www.water.ca.gov/floodsafe/fessro/levees/drms/phase1_information.cfm#
C. TNC’s Engagement in the Bay Delta Conservation Plan and Our Objectives for Successful Ecological Restoration in the Delta

It is in this context that TNC has supported the concept of the BDCP, with its proposed alternate conveyance facility combined with extensive ecosystem restoration. While the siting of any large infrastructure project is complex with many issues to consider, our comments are directly focused on the ecological goals that have been articulated for the BDCP.

TNC is a strong advocate for large-scale restoration of unique habitat conditions in the Delta necessary for ecological functionality, while ensuring reliable water supplies for people. We have invested significant resources in the BDCP because it is our view that in this moment, the BDCP or an equivalent Plan is an essential component for reversing a steady decline in the Delta ecosystem, and reconciling ecosystem recovery and statewide water resources management.

In addition to working in the Delta as a conservation organization, TNC also is an active landowner of Delta islands. TNC owns McCormack-Williamson Tract and Staten Island, both of which are managed to achieve ecological objectives, and TNC has been protecting and implementing restoration of riparian habitats on the Cosumnes River Preserve on the eastern edge of the Delta for decades. At McCormack-Williamson Tract, TNC has led efforts to restore riparian and intertidal wetland habitat in collaboration with multiple partners, including the Department of Fish and Wildlife, the Department of Water Resources, UC Davis, and the San Francisco Estuary Institute. At Staten Island, for more than 20 years TNC has led integrated conservation efforts in wildlife-friendly farming practices essential for the preservation of sandhill cranes - about 15% of the Central Valley Greater Sandhill Crane subspecies winter there. TNC thus is well versed in the challenges and complexity of attempting – much less achieving – comprehensive ecosystem restoration efforts in the Delta. TNC’s dual role in the Delta gives us a unique perspective in the management, science, and integrated resource planning necessary for Delta restoration efforts to succeed.

TNC’s wider vision and aspirations for Delta restoration efforts within the scope of BDCP are founded on the following priorities:
1. Achieving Delta flows that mimic natural flow characteristics, including increased freshwater flows (from both the Sacramento and San Joaquin Rivers) into and through the Delta, and which deliver more natural seasonal and inter-annual variability;
2. Rebuilding natural diversity and resilience of the Delta ecosystem;
3. Expanding floodplain connectivity and functionality throughout the eastern, southern, and northern Delta;
4. Restoring natural intertidal and wetland function in Suisun Marsh;
5. Augmenting seasonal and managed wetlands habitat for a diversity of migratory birds in and around the Delta;
6. Restoring freshwater tidal wetlands in a manner that ensures no net loss of freshwater wetland habitat, an increasingly important element of Pacific Flyway viability in California;
7. Expanding implementation of wildlife-friendly agricultural management practices on existing croplands;
8. Improving central and south Delta floodplain habitat and/or bypass facilities;
9. Reducing impacts of urban and commercial development;
10. Improving Delta flows through integration of new operations and facilities, including a peripheral tunnel designed and operated to reduce stress on the Delta ecosystem;
11. Supporting a comprehensive science program that informs adaptive management actions; and
12. Establishing an independent and competent governance structure that can effectively implement actions required to recover species and enhance the function of the Delta ecosystem.

These objectives have guided our long-term engagement in the Delta and our approach in evaluating the BDCP. To put our Delta engagement in context, TNC has consistently observed and operated from the perspective that the status quo approach to water management and ecosystem improvements is a slowly unwinding ecological disaster in the Delta. As both water management actions and restoration programs in the Delta are now effectively administered by
the courts, we see the status quo in the Delta today as simply a series of actions aimed at avoidance of the declaration of “jeopardy” with the likely result of continued declines of threatened and endangered species in the Delta to the point where these species face an irreversible path to extinction (Mount et al. 2013). Additionally, we note that the recently published Independent Science Panel Report on the Delta affirms many of the critical perspectives of the Delta ecosystem, and the importance of sound adaptive management practices in achieving the goals of the BDCP.

D. Recommended Modifications to Enhance Likelihood of Success in the BDCP

While the BDCP, as currently designed, is not likely to achieve its intended goals, TNC believes there are some feasible modifications that can be made which will enhance the likelihood of success. These modifications include:

1. Ensuring adequate flows to complement and ensure success of habitat restoration, recognizing that ‘adaptive management’ in the Delta will require flexibility in managing both habitat conditions as well as necessary flows;
2. Focusing restoration activities as much on habitat viability as on specific numbers of acres; and
3. Designing governance of export operations in a manner that is capable of modifying and delivering necessary flows through the Delta to meet multiple Delta ecological considerations.

TNC also recommends policy actions to provide the necessary conditions for BDCP to succeed.

1. Ensure Adequate Outflows to Complement and Ensure Success of Ecosystem Restoration Across the Differing Needs of Multiple Species

Based upon considerations in meeting multiple species needs, the BDCP needs to assure sufficient outflow in all seasons and in all water year types (particularly dry and critically dry conditions).
years) to maintain healthy populations. Currently, minimal flows are prescribed by existing legal settlements such as D-1641 and the biological opinions on system operations (OCAP)\textsuperscript{7}

Figure 1 (below) demonstrates the complexity of flow conditions aligned with the needs of particular species, demonstrating complex spatial and temporal components of flow regimes that vary across different species.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{flow_matrix.png}
\caption{Matrix of fish species responses to a variety of flow-related parameters (Fish Agency Scenarios for BDCP Initial Operations Development, May 2012). Note that the Importance to species ranges from high to critical in this figure therefore all of the flow components listed here are important to at least one species.}
\end{figure}

\textsuperscript{7} On December 15, 2008, the Fish & Wildlife Service issued a biological opinion (BO) on the Long-Term Operational Criteria and Plan (OCAP) for coordination of the Central Valley Project and State Water Project.
2. **Prioritize and Focus on Near-Term Restoration Actions That Are Likely to Achieve Ecosystem Function and Habitat Viability Objectives**

Restoring a targeted number of acres in the Delta will be an important component of recovering the health and functioning of the Delta ecosystems. However, acres should not be the sole measure of success since it is unknown exactly how many acres of different type and condition will be needed. In addition, uncertainty about the impacts of climate change and how the system will respond to changed infrastructure operations, and the inability to address stressors outside the scope of export operations all serve to add additional uncertainty around critical BDCP assumptions. In particular, current acreage targets for habitat restoration were selected based on restoration potential given existing land uses and other constraints (mostly abiotic factors) within the various restoration opportunity areas. However, how exactly populations of covered species and the ecosystem will respond to restoration at the proposed scale of BDCP remains uncertain, especially in the context of climate change. Whether or not the proposed restoration actions and other complementary efforts in the Delta translate into population increases for the covered species is an untested hypothesis.

For these reasons, BDCP should focus immediately on testing restoration of high quality habitat in areas with high potential for success and areas that will prove to be instructive in implementing conservation projects over time in an integrated fashion. This approach can help inform adaptive management and result in conservation programs that are of greatest benefit to the species based on the new information that is generated, rather than assuming implementation of the prescribed fixed acreage targets will achieve the recovery objectives of BDCP. We recommend that early experiments be conducted that will partially fulfill the proposed Conservation Measures, but also explicitly be used to test assumptions and quantify impacts in ways that improve future Conservation Measures. Restoration actions judged to be of potentially high impact and that need to be tested include:

1. **Yolo Bypass** - In the Yolo Bypass there are ranges of habitat modifications that can be undertaken in a relatively near-term basis that can improve floodplain functionality and deliver other habitat benefits. It will be important to better understand the relationship
between habitat improvements and the timing, frequency and inundation periods, and corresponding benefits to species recovery, especially among salmonids.

2. Tidal Wetlands Restoration - Under Conservation Measure 4, there are a number of restoration projects that if tested at smaller scales initially can help inform the design of restoration over time that will improve the chances of success. We recommend that BDCP include using existing projects that are being proposed outside of BDCP, as well as early implementation of BDCP Conservation Measures as learning laboratories. This could include the McCormack-Williamson Tract project (a TNC project) which will provide important information about new intertidal habitat at the confluence of the Mokelumne and Sacramento Rivers. This project is being designed to improve habitat for the benefit of salmonids and tidal marsh dependent species. The project will also provide important information about what design features and affected ecological processes contribute to or hinder invasive aquatic species in this part of the Delta.

3. Nontidal Marsh Restoration - Conservation Measure 10 is also an important early stage restoration effort as it is important to avoid net loss of freshwater marsh habitat in the Delta as part of wider restoration objectives. Increasingly – and especially in drought years – the wetland habitat in the Delta for sandhill cranes, waterfowl, and shorebirds are critically important for migratory birds. Additionally, as a practical matter it is important to demonstrate that habitat to benefit some species in the BDCP does not come at the expense of other habitat values in the Delta. We recommend that early implementation and experimentation be carried out to improve designs and quantify response of species that may be impacted loss, changes to, or restoration of non-tidal freshwater wetlands. For example, creation of new habitat for sandhill cranes to compensate for impacts to habitat will require some certainty that sandhill cranes are able to locate and begin using these new habitats successfully. This should be tested soon, rather than assume that if BDCP builds it they will come.

Based on early stage restoration efforts, subsequent restoration actions must be shaped, evaluated, and redesigned based upon a robust science program capable of measuring
ecosystem and species response. Scientific information will continue to evolve and should be used to make adjustments to restoration programs and projects as well as and acreage targets. This strategy must necessarily be implemented with substantial flexibility over multiple decades in order to have a chance to achieve recovery of affected species.

3. **Export Operations Must Be Governed to Meet Multiple Delta Ecological Flow Needs**

In order to achieve recovery objectives across multiple species, the Ecological Flow Tool and other scientific studies (Mount et al. 2013) demonstrate that flows will need to be managed in ways that increase both seasonal and inter-annual hydrologic variability that help suppress invasive species and promote natives. Whatever permit is issued must incorporate the needed range of total flows and require flexibility in magnitude, timing and duration. This flexibility needs to be coupled with species-level monitoring to allow for better understanding of the relationship between flow and population abundance and inform appropriate changes through adaptive management as conservation strategies incorporate evolving conditions and we learn more about how integrated conservation actions perform.

Exports directly impact outflow and the position of the X2 salinity isocline that are critical for the biological health of the Delta. Therefore export operations are an important component of meeting ecological flow needs and one of the few variables that can be managed adaptively in the system. Under the proposed BDCP scenarios run to date, exports range from 4.5 MAF (CS5), to 5.4 MAF (S6) to 5.9 MAF (Alt 1a/PP). Only CS5 reduces exports from current baseline yet exports would still remain higher than 57% of the years since 1951.

The scientific consensus is that reducing exports and allowing more variable flows will have the greatest impact on restoring the Delta ecosystem (Hanak et al. 2013). Reducing exports in dry years is of particular importance, as already reflected in one of the BDCP objectives. The BDCP and associated operations should be implemented in ways that allow export volumes and timing to be changed adaptively throughout the term of the permit, especially given the proposed 50-year permit term, and the high level of uncertainty about how species health evolves in response to conservation actions. Consequently, any approved export allocation and
commensurate operations plan should include criteria that is informative about when flows will be taken from the new north Delta diversion point, and when exports will be accommodated by south Delta pumping to better understand potential entrainment and other impacts on covered species. Additionally, the BDCP should include operational criteria for all alternatives that are adequately documented. TNC is generally agnostic on the sizing of an alternate conveyance facility as we have consistently maintained that it is how the facilities are operated that will be determinative whether the BDCP will meet defined biological objectives. Additionally, as a practical matter, project operations should be subject to approval and oversight of the wildlife agencies, consistent with other NCCP governance practices.

4. Additional Policy Actions Required to Provide Conditions for BDCP to Succeed

While the BDCP is a “stand alone” permit, in order to succeed, it must also align with other critical water management reforms, including sustainable management of the State’s groundwater resources. Consistent with California’s ‘dual goals’ adopted as part of the State’s 2009 water reforms, the BDCP must result in reduced reliance on the Delta as a water supply source, along with an active restoration program in the Delta. As a starting-point, the following measures should be undertaken in parallel fashion with the BDCP and BDCP permits linked to adherence to and progress on these critical actions:

1. Continued enforcement of California’s constitutional prohibition against non-beneficial, unreasonable, and wasteful water use.
2. Protection of values recognized under the public trust doctrine including adequacy of flows in navigable waterways and tributaries.
3. Integration of sustainable groundwater management into California state water policy and local water district and individual water user actions.
4. Demonstrably increased statewide focus on water conservation (including improved efficiency and productivity of use).
5. Projects designed to reconcile overall water demand that serve to reduce pressure on the Delta.
TNC also recognizes that even the most effective BDCP cannot in itself result in successful restoration of the Delta. TNC’s efforts to analyze the BDCP include review of BDCP documents; coordinating and helping to fund independent scientific analysis; and joining in different complimentary dialogues and processes aimed at ecological restoration in the Delta as well as participating in specific multi-party groups focused on such issues as implementation of the near-term biological opinions. Our conclusion based on all of these engagements and our own conservation and water management work across the region and State is that restoration of ecological values and water supply reliability in the Delta will depend on an integrated Plan, such as the Governor’s Water Action Plan that successfully implements comprehensive water management reforms across the entire connected system.

D. Future Water Reliability Should be Achieved through Water Optimization and Not through Increased Delta Supplies

To meet ecological objectives, exports from the Delta will need to be reduced most dramatically in dry years and may also need to be reduced in all but wet years (Hanak et al. 2013, Mount et al. 2013). Reductions in exports at critical times to maintain Delta outflows will be partially compensated for by increasing exports in wet years. However, optimizing management of the system to increase the health and resiliency of the Delta ecosystem, while also achieving greater water supply reliability, will also require water conservation, efficiency, and water management reforms related to groundwater, transfers and storage. Additionally, there must be a reconciliation of total available water resources within and outside the Delta to manage water on a sustainable basis. In support of this principle, The National Research Council (2012) acknowledges that while most surface flows in California have been fully allocated or over-allocated, this does not mean the state is “running out of water.” The committee recommends that the state undertake “a comprehensive review of its water planning and management”.

Whether or not the BDCP goes forward, TNC believes that it is imperative that conservation actions in the Delta must be integrated in larger integration of water management efforts. Such an approach is fully consistent with Governor Brown’s Water Action Plan which outlines a
series of actions designed to achieve sustainable use of water resources for the long-term benefit of people, agriculture and wildlife.

Section II– Specific Concerns with the BDCP

A. Project Operations Must Be More Flexibly Designed to Achieve Flows Required to Meet Multiple Species Needs

The preponderance of scientific data point to the conclusion that increased average outflow, along with more variable outflows are required to achieve the desired conservation outcomes in contributing the recovery of threatened and endangered aquatic species (Mount et al. 2012, Moyle et al. 2011, National Research Council 2012, Hanak et al. 2013). Dual conveyance conceptually could provide the operational flexibility that would allow for increasing Delta outflows at critical times and creating the kind of seasonal variation in flows that benefit native species and discourage invasive species. However, regardless of operational flexibility, flow regimes will need to be adaptively managed to meet the differing needs of multiple species. We are skeptical that the operations as proposed and modeled (including those we evaluated independently), reflect what actual future operations will be. As proposed and modeled in the BDCP the resulting flows contain inconsistencies with independent analysis of the flows resulted from the proposed scenarios (Mount et al. 2013) and may result in either equivocal benefits to target species or trade-offs among target species that are difficult to reconcile (Alexander et al. 2014). This only adds to the already abundant uncertainty in the ability of the BDCP to achieve its intended goal of restoring a healthy Delta ecosystem.
1. **BDCP Models Show that Proposed Flow Scenarios Will Provide Limited Benefits to the Covered Species**

Based on our evaluation of the BDCP models and impacts on flow, the operations and resulting flows are predicted to have potentially significant beneficial effects for Delta smelt; however, results for longfin smelt and other covered fish species are ambiguous (Mount et al. 2013, Alexander et al. 2014). Differences in high outflow versus low outflow scenarios have varying impacts, both beneficial and adverse, for different species – calling out the need for an effective and well-coordinated adaptive management program. For example, the Mount Report effects analysis of proposed operations predicts the following outcomes with respect to the low outflow scenario (LOS) and high outflow scenario (HOS):

1. Modest improvements overall under LOS and HOS scenarios;
2. Both LOS and HOS scenarios decrease incidence and magnitude of negative flows, suggesting potential reduction in direct impacts of pumping through entrainment. HOS provides most benefit;
3. Outflows during periods of vulnerability for adult smelt (Dec-Mar) and juvenile smelt (Apr-Jun) increase under LOS and HOS over the No Action Alternative; however, flows in Old Middle River remain negative in all but the wettest years and outflow under the LOS is lowest among alternatives during wet years;
4. Small positive effect on San Joaquin River Outflow that may benefit migrating salmon;
5. In intermediate years, north Delta diversions seem to just augment south Delta exports rather than replacing them;
6. Despite predicted, but marginal improvements in flows, independent models suggest that there will be no significant increase in smelt abundance under any of the proposed scenarios.

Several of the modeled outcomes suggest potentially negative impacts, including:

1. Continued reverse flows in the Old and Middle Rivers in all but the wettest years;
2. The potential that all predicted benefits will be overwhelmed by inter-annual variation due to natural factors and carry-over effects of storage across years;
3. Potential benefits of the proposed alternative operations for covered species are almost entirely for Delta smelt with little benefit accruing to longfin smelt and salmonids with potentially negative impacts on longfin smelt of the LOS compared to NAA;

4. While implementation of the BDCP as proposed will increase floodplain habitat on the Yolo Bypass, benefiting listed salmon, the timing of outmigration and difficulty of diverting fish onto the bypass will limit the benefits (Mount et al. 2013);

5. The modeling also shows that the North Delta diversion facility will have direct and indirect adverse impacts on covered fish species and it is uncertain whether the measures proposed under Conservation Measure 2, Yolo Bypass Fisheries Enhancement, will fully mitigate for these impacts on salmonid entrainment, let alone lead to net improvements in population of covered species;

6. To further complicate matters, north Delta diversions must meet flow bypass requirements in intermediate and drier years and thus are intended to augment south Delta exports rather than replacing them.

2. TNC’s Independent Modeling, Using the Ecological Flows Tool, Also Shows Mixed Benefits to the Covered Species From the Various Flow Scenarios

TNC used the EFT (Alexander et al. 2014) to model the target species outcomes of the proposed BDCP scenarios in order to better understand the potential impacts of the proposed conservation actions and the correspondent, and potentially unintended, outcomes on multiple species and habitat types. The EFT analysis of BDCP scenarios generally supports our conclusion that there are potentially substantial benefits to covered species, but those benefits are uneven, and it is difficult to project any particular flow regime that has universal benefits for all aquatic habitat conditions – and species dependent on those habitats – from implementation of either the LOS or HOS options (Alexander, Robinson, and Poulsen 2014). EFT results more importantly illustrate significant limitations to the proposed alternatives due to the limited set
of options being considered and the varying effects on different life-history stages of each species.

In particular, the EFT analyses of the BDCP alternatives show that overall, the Low Outflow Scenario (LOS) BDCP alternative is preferable for species completing life-history stages in the Sacramento River (especially fall-run Chinook, late fall-run Chinook and spring-run Chinook) while the High Outflow Scenario (HOS) BDCP alternative is preferable for San Joaquin-Delta species (especially longfin smelt and, to a lesser degree, Delta smelt). Fall-run Chinook, late fall-run Chinook and splittail do better under all BDCP alternatives considered ("winners"), while green sturgeon, deterrence of invasives, and brackish wetland habitats are expected to experience deteriorating conditions under the HOS alternative. Spring-run Chinook are expected to do the most poorly under ESO and HOS alternatives in terms of spawning habitat, egg-to-fry survival, and redd dewatering. In general, juvenile stranding losses increase, particularly for winter-run Chinook. Delta temperature stress on winter-run Chinook also increases over all Early Long Term (ELT) alternatives. Likewise, Delta temperature stress is also elevated for all ELT alternatives for steelhead. The EFT results suggest the HOS is more likely to benefit Delta smelt and the LOS is predicted to be detrimental to longfin smelt.

3. **TNC’s Independent Modeling Demonstrates That Climate Change Will Likely Have a Greater Impact on Operations than Anticipated in the BDCP**

Analyses of BDCP scenarios using the EFT, which includes changes in future climate and sea level, highlight the need for greater focus on efforts to mitigate for the direct impacts of climate change as a singular force in the Bay-Delta ecosystem and its tributaries. EFT results predict that climate change impacts may overwhelm some of the benefits gained through changes in operations (Alexander et al. 2014). The latter challenge illustrates the need to have climate change mitigation and adaptation strategies more explicitly built into operational scenarios in BDCP and that they be included and evaluated in any adaptive management program for BDCP.

With a few exceptions, the climate change signal and effects in the BDCP study generally dwarfed the operational alternatives considered in the scope of the BDCP, especially in the Late
Long Term period (LLT) (Alexander et al. 2014). The BDCP proposed alternatives could have the potential to provide some offsetting benefits to help compensate for climate change effects. In particular, spawning habitat is improved by the conveyance and operations in BDCP alternatives for fall-run Chinook and spring-run Chinook (LOS alternative only). Delta rearing conditions may improve by notching of the Fremont Weir associated with the Expected Starting Operations (ESO), LOS and HOS BDCP alternatives, offsetting losses that are otherwise expected for late fall-run, winter-run and, to a lesser degree, spring-run Chinook. Spring-run Chinook may also receive compensatory offsets of otherwise detrimental climate change effects from the LOS scenario, in terms of reductions to redd dewatering losses and improved Sacramento River rearing conditions. Unfortunately, it is unknown whether these benefits will be sufficient to compensate for the remaining impacts predicted by EFT for other portions of these species life-history.

4. “No Action Alternative” Baseline Demonstrates the Significant BDCP Challenge in Meeting Recovery Standard

The magnitude of predicted climate effects illustrates the inadequacy of evaluating alternatives relative to a No Action Alternative, which represents a progressively deteriorating baseline. Based on that standard, the preferred alternative could be selected based on slowing the rate of loss relative to doing nothing but allowing the covered species to continue declining. Studies that ignore such changes to the baseline divert attention from the cumulative total change in ecological conditions and can mask what can often be striking differences between historic operations and those proposed. Use of a historical reference case was recommended by the Delta Science Panel in its review of BDCP, even though the approach is unwelcome by some who feel that use of a historical record is a flawed reference with numerous shifts in operational standards and climate. The counterpoint to this critique is that the use of a historical reference case better enables the evaluation of alternatives relative to whether they are capable of recovering populations to some level of stability, as opposed to which alternative is most effective in slowing the degradation of the Delta ecosystem – or recovering any particular species. Analysis of alternatives should be compared to historical conditions to
provide a more informed assessment of the systemic impacts of climate — whether the LOS or HOS alternatives — and, it is imperative to evaluate BDCP and its proposed conservation strategies 2-22 in the context of whether those conservation measures are likely to increase ecosystem resilience amid other values in the Delta.

B. The Uncertainties Surrounding the Anticipated Ecosystem Benefits of the BDCP Make Independent, Effective, Accountable and Adaptable Governance Essential

As illustrated in our concerns above, there are many uncertainties regarding how species will respond to the proposed operational scenarios as well as any other yet to be evaluated scenarios. In addition, the BDCP as currently designed is overly optimistic about the benefits that will result from habitat restoration in the Delta, which are also fairly uncertain. As a result, any assessment of how the BDCP is likely to perform in improving species viability is likely to be speculative and, for this reason, an effective BDCP will require a comprehensive, well-funded, and clearly defined adaptive management strategy within capable decision making authorities and within permit terms that allow flexibility in magnitude, timing and duration of water flows. The assurances offered State and federal water contractors must incorporate greater flexibility in managing water flows.

While “adaptive management” processes can be established and funds expended, there is no example in this nation of substantial change in operations of a large project occurring as the result of "adaptive management" standing apart from permit conditions and effective decision-making authority. A notable example of the challenge is provided by Glen Canyon Dam, where experimental adaptive management high flow releases of large pulses of water demonstrated important sediment distribution advantages to downstream Colorado River ecosystems, but operating rules over flows have not been changed.8 Existing operating rules are supported by

8 For recent environmental documents showing how the high flow experiments are conducted within parameters of the original ROD, see: http://www.usbr.gov/uc/envdocs/ea/gc/HFEProtocol/index.html. For an academic analysis of agency/science/stakeholder relationships, see: http://www.columbiaenvironmentallaw.org/assets/pdfs/35.1/Susskind_35.1.pdf. Additional examples of challenges to large scale adaptive management efforts include Northwest forestry management, the Everglades and the Chesapeake Bay watershed.
significant users and the high flow experiments have been undertaken within water flow parameters of adopted operating rules. To change operating rules requires expensive and politically challenging environmental review processes. A similar challenge would confront parties seeking to change the adaptive management framework proposed within the BDCP. After Plan adoption, significant change in BDCP water operations would require environmental review processes equivalent to those required for permitting and project completion now.

The central principles of effective adaptive management are scientifically robust monitoring and, at times, experimentation, using new information to adjust practices and policies (in this instance water management operations and habitat restoration designs) to achieve the ecological objectives (National Research Council 2004, Williams 2011). Unfortunately, while BDCP provides extended discussion of an adaptive management program, much less attention is given to changing behaviors and operations and a decision-making framework that will result in the practice of actual adaptation.

The BDCP proposes an adaptive management strategy as part of its science program to guide and adapt operations over time and appropriately acknowledges the significant uncertainties around function of the Delta ecosystem and its response to BDCP implementation. However, the proposed strategy is inadequate to ensure that either biological objectives, implementation of actual conservation measures (beyond Conservation Measure (CM) 1), or a framework that can predictably lead to adaptive management actions can be achieved. Even Conservation Measure 2, Yolo Bypass Fisheries Enhancement, is not clearly defined, especially regarding magnitude, timing, and duration of flows. In addition, private ownership of land in the Delta, conflicting uses, and regulations all are practical realities that will need to be addressed as part of the restoration efforts.

1. Adaptive Management Must Inform, Support and Constrain Decisions

The discussion of adaptability in BDCP documents is complex, spread among several locations and difficult to comprehend in total. Figure 2 presents the variety of possible adaptive actions in a reasonably coherent whole. An important inference from Figure 2 is that BDCP identifies only three areas for adaptive management, regarding possible changes in (1) biological
objectives, (2) conservation measures and (3) six of the nine changed circumstances. These could be useful roles, but are limited to techniques to complete an activity and possibly providing information upon which resources are shifted among conservation measures. In sum, the authorities for adaptive management are narrowly and prescriptively defined in a manner that is likely to inhibit the actual practice of adaptive management.
<table>
<thead>
<tr>
<th>Feature of BDCP</th>
<th>Scope of change possible</th>
<th>Specified processes available/required or specific decision maker required</th>
<th>Final decision by</th>
<th>&quot;Full&quot; requirements, incl. plan, EIR/EIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Adaptive Mgmt IA: 10.3.4 and PD: 3.6.3.5.3.</td>
<td>Review of disputes IA: 15.8</td>
<td>Specified decision maker</td>
</tr>
<tr>
<td>Conservation strategy</td>
<td>No change anticipated</td>
<td>No</td>
<td>To change, Yes</td>
<td></td>
</tr>
<tr>
<td>Biological goals</td>
<td>No change anticipated</td>
<td>No</td>
<td>To change, Yes</td>
<td></td>
</tr>
<tr>
<td>Biological objectives</td>
<td>Within biological goals</td>
<td>Yes (or formal amendment)</td>
<td>Yes</td>
<td>Yes: execs, fish agencies</td>
</tr>
<tr>
<td>Conservation measures</td>
<td>Within biological goals and objectives</td>
<td>Yes (or formal amendment)</td>
<td>Yes</td>
<td>If done as a Formal Amendment (Sec 23.3)</td>
</tr>
<tr>
<td>Changed circumstances</td>
<td>Planned responses specified for a list of nine circumstances</td>
<td>Six include use of AM; three specify actions</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Unforeseen circumstances</td>
<td>As acceptable to Permittees</td>
<td>No</td>
<td>No</td>
<td>Fish agencies &quot;prove&quot; existence</td>
</tr>
<tr>
<td>Decision tree</td>
<td>Reduce outflows</td>
<td>Special process</td>
<td>Fish agencies</td>
<td></td>
</tr>
<tr>
<td>Annual water ops plan</td>
<td>Within permit terms</td>
<td></td>
<td>DWR/Bureau; POG concurrence</td>
<td></td>
</tr>
<tr>
<td>Real time operations</td>
<td>Within annual water ops plan</td>
<td>No</td>
<td>No</td>
<td>If dispute, yes: execs, fish agencies</td>
</tr>
<tr>
<td>Routine or admin matters</td>
<td>Consistent with conservation measures</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Permit suspension</td>
<td>Special provisions for jeopardy: Sec 22.6</td>
<td>No</td>
<td>Yes, after section 22.5</td>
<td>Yes: execs, fish agencies</td>
</tr>
<tr>
<td>Permit revocation</td>
<td>Special provisions for jeopardy: Sec 22.6</td>
<td>No</td>
<td>Yes, after section 22.5</td>
<td>Yes: execs, fish agencies</td>
</tr>
</tbody>
</table>
2. The consensus-driven adaptive management structure as currently defined in the BDCP impedes timely adaptive management actions

The proposed Adaptive Management Team (AMT) consists of a broad array of staff from agencies, contractors, and science programs that will be chaired by the BDCP Science Manager. The Science Manager is selected by the Program Manager who, in turn, answers to the Authorized Entities Group (AEG). The AMT is tasked with initiating any proposed changes to conservation measures and biological objectives based on new research and monitoring. The AMT as proposed will be consensus driven with any unresolved decisions taken to the AEG and Permit Oversight Group (POG) for resolution. For minor modifications, the POG will make the final decision. For formal amendments and changes in biological objectives or conservation measures adopted through the adaptive management process, the Fish and Wildlife Agency official with jurisdiction will make the final decision.

However, achieving consensus among such diverse stakeholders within the AEG and POG has the potential to be extraordinarily time-consuming, and this creates a structure in which one party may delay or obstruct implementation of adaptive management actions. Also, the proposed structure of the AMT, with regulated entities retaining a large role, directly and indirectly through the Science Manager, in deciding how adaptive management is used and what changes to operations are proposed presents a significant conflict of interest.

Finally, even if consensus is attained on a timely basis, any formal amendments to the BDCP, including changes to conservation measures or biological objectives, must follow the same process that has been followed for the initial approval of the BDCP. This apparently would include full NEPA/CEQA analysis, public review and comment, including publication in the Federal Register, and section 7 consultation. All of this portends a very time-consuming and contentious process that reduces the likelihood that such changes will be adopted in a timely or effective manner, further hindering the ability to effectively adaptively manage the system.
3. The Adaptive Management Strategy Must Include an Experimental Approach

The uncertainties surrounding the proposed conservation measures to achieve the desired ecosystem benefits are well established. Experimental restoration projects are necessary to determine whether the proposed restoration actions will achieve their intended outcomes. For example, there is strong evidence that smelt are food limited, especially from spring through fall each year (Miller et al. 2012). But BDCP overestimates the effects of increased plankton production and export from restored marshes and floodplains. Based on calculations prepared on behalf of TNC and American Rivers (Mount et al. 2013), even assuming highly favorable assumptions about production and export of plankton, restored tidal marshes and floodplains will likely make at most a modest contribution to increasing food availability for smelt and Longfin smelt don’t use tidal marshes frequently. Delta smelt may benefit given their frequent use of shallow water and areas like Cache Slough, but the magnitude of the effect is impossible to predict. Nevertheless, many other species, other than smelt, are likely to benefit from restoration, but here too it is difficult to know by how much. The high level of uncertainty about outcomes points to the need for experimental restoration projects early in the implementation of the BDCP to determine whether large-scale, expensive restoration will achieve the assumed food-production and habitat provision goals, using science and adaptive management to improve implementation over time to design optimal restoration programs.

Lessons learned from tidal marsh restoration will play out over a long timeframe. Therefore, it becomes critically important to initiate restoration projects now to start the learning process and develop relevant knowledge that can be applied and guide restoration over the next 10–30 years. The BDCP must acknowledge and plan for the fact that it is highly unlikely that any habitat solutions and flow regimes will benefit all species. There will always be tradeoffs, winners and losers, and science can only provide alternatives for decisions to manage tradeoffs. A strong decision making process must be in place address this challenge.

Water project operations designed to increase Delta outflows and increase the frequency and duration of flooding on the Yolo bypass represent primary strategies in BDCP that can be
adaptively managed on temporal scales that allow early and regular adjustments to operations based on new understanding.

Overall, the BDCP science program needs to provide clear measurable goals and objectives in a manner by which BDCP implementation and performance can be measured, improved upon and adjusted to reflect changing scientific understanding and changing environmental conditions. All major elements of the science program should be peer reviewed on a periodic basis by the Delta Independent Science Board. The BDCP should actively apply an integrated scientific process and reliable scientific tools - such as the Ecological Flows Tool - to inform the adaptive management conducted under the Plan. The science developed under the Adaptive Management Plan should more explicitly inform a rigorous and transparent decision-making process. Given the scientific uncertainty and variables to success that surround the BDCP, an effective adaptive management regime will in all likelihood define the success or failure of the BDCP. Incorporating such analyses and information as the core of the BDCP can provide an ongoing evaluation of the successes and failures of the BDCP to chart progress in attaining biological goals and objectives. The structure of advisory committees under BDCP, lack of specific funding commitments, absence of an “experiment-based” approach to restoration, and the lack of accountability to modify habitat and flow strategies in a practical sense all represent significant impediments to the viability of the existing adaptation and ‘decision tree’ approach in the BDCP.

4. **Independent Science Review and Coordination with Existing Science Programs is Critical**

The AMT is required to seek independent science review of research and monitoring results or proposed changes to operations only as the AMT determines appropriate. Given the proposed structure of the AMT and its consensus-driven approach, we believe this discretion is unlikely to lead to a meaningful level of independent review by subject experts, significantly hampering the ability to appropriately change operations based on the best available science. Lack of independence will bias use of information and again serve to likely stall any real use of adaptive management.
The BDCP proposes that the research and monitoring program of BDCP and the AMT will be well-coordinated with existing science programs in the Delta (e.g. Delta Science Program). A more detailed and specific commitment to full integration of science across entities and programs in the Delta is recommended to effectively coordinate research and monitoring, achieve the economies of scale needed to implement the massive effort this will require, and to ensure the best available science is truly applied to adaptive management of the BDCP. Without this level of detail, the potential for a lack of integration with other science programs could result in redundancy or, at worst, conflicts.

5. The Adaptive Management Program Must be Adequately Funded

The adaptive management program and its coordination with other efforts will require significant financial resources and no specifics on funding or commitments to funding are provided in the BDCP. The BDCP proposes a commitment to funding, but no details are provided on how that funding will be administered.

As noted above, numerous scientific, operational, and conservation assumptions create significant uncertainties regarding whether the BDCP can achieve its intended objectives. This is precisely why a well-funded, coordinated, and effective adaptive management framework will be essential if BDCP is ultimately to succeed in rebalancing Delta ecology.

6. The Real Time Operations Lack Critical Details that Will Undermine Ability for Future Adjustment

One component of the proposed adaptive management program for BDCP is application of an annual process of Real Time Operational adjustments (see Implementing Agreement, Section 10.2.2). The proposed objective is to annually evaluate the impacts of operations and the resulting flows on Delta and longfin smelt, and use this information to make operational adjustments in the following year. We applaud the idea in concept given the uncertainties that exist around how changes in flows will ultimately impact these populations. We believe this

9 Subsequent references to the Implementing Agreement are cited as “IA § x.x.x.”
could be a useful approach and important part of adaptive management strategy and suggest that this annual approach be well coordinated as part of the larger science efforts in the Delta – through the Delta Science Program and, if implemented, continued for the life of BDCP.

However, we are concerned that there are no details about how real time operations would be implemented, structured, and used to make actual project operations decisions. Under the proposed BDCP, decisions regarding real time operations are to be made by a Real Time Operations team, composed of designees from the Fish and Wildlife Agencies, DWR and the USBR, and non-voting representatives of the water contractors. However, if the agency directors are unable to reach agreement about real time operations, no adjustments will be made. As a practical matter, this “default scenario” weighs heavily towards status quo operations, presumably based upon best case scenarios in the plan about the availability of water for export. Unless decisions related to real-time operations are part of a well-funded and coordinated effort across stakeholders, it is unlikely that this approach will resolve operations issues within the 10 years before operations with new conveyance go into effect. If this presumption is correct, it raises questions as to what decision would be made regarding which export operations criteria will be put into effect to start with, having not resolved some of these key uncertainties regarding impacts of flows. An example is seen in discussions of adaptive management in the Public Draft which emphasize “water-neutral” adjustments, meaning “no net annual water supply impact.”

7. Decision Tree Framework Must Include an Option that Allows for the Possibility that Initial Outflows May Not Be Sufficient to Achieve the Biological Objectives

Another problematic component of the adaptive management process is the proposed Decision Tree approach to manage Delta outflows until the alternate conveyance facility becomes operational. Implementing the decision tree framework to achieve both water supply and desired ecological outcomes will require resources of scientists and fish and wildlife agency

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10 See BDCP Public Draft, Section 3.4.23.1, page 3.4-355.
decision makers, competing with other demands on their energies, budgets and political capital.

However, the BDCP lacks critical details about how the Decision Tree process will be implemented. Intense political pressure and conflict can be expected to be part of any decision tree procedure and this tension should be incorporated in the design. As a starting-point, the decision tree options should be symmetrical, e.g., allow for increased as well as decreased Delta outflow, as dictated by the science. The current decision tree framework is weighted towards supply considerations. However, new science and understanding could result in the conclusion that even proposed high outflows are too low to achieve intended biological goals and objectives.

Among ambiguities in the BDCP is whether the high outflow scenario (HOS) is a potential baseline permit condition, or whether the low-outflow scenario (LOS) provides the baseline for the permit. Starting at the high outflow values would be a traditional way to address the uncertainties and risk to species identified in BDCP. We note also that a permit which starts at the low outflow levels would require very high effort – and intense political conflict - to reestablish high flow parameters.

The decision tree framework should include the following elements:

1. Clearly establish "best readily available science" as the only decision rule when considering changes in outflow and explicitly remove reference to the narrower decision criteria now included at Table 304-1-1, pages 3.4.18 through 3.4.20, in particular under "spring outflow" at page 3.4.19 and "fall outflow" at page 3.4.20;
2. Explicitly list the decisions for which the dispute process of section 7.1.7 is available;
3. Require permit applicants to adequately fund the science process up front, and establish an independent entity such as the Delta Science Program as the “home” of the science process;
Effective design of implementation processes, scientific review and public engagement are essential to the success of the decision tree process (e.g., use of external peer review panels as appropriate, establish a calendar of activities and structured decision points).

8. **Rough Proportionality Mechanisms Are Not Clearly Expressed, Likely Reducing Effective Accountability**

As a Natural Community Conservation Plan, the BDCP must implement mitigation and conservation measures on a schedule that is “roughly proportional in time and extent to the impact [of an action] on habitat or covered species.” (California Fish & Game Code, section 2820, subd. (b).)

“Rough proportionality” among water supply and ecosystem conservation actions is required, but the proposed linkages are not clearly defined and not effective until years in the future. In particular, the construction of CM 1 will effectively lock-in water flows for all elements of the BDCP.

In addition, the *Implementing Agreement* states: "The Implementation Office will ensure that the Conservation Measures are implemented substantially in accordance with the Implementation Schedule, Exhibit D."11 The Implementing Agreement goes on to state that “[i]f the Conservation Measures are implemented in accordance with the Implementation Schedule [Exhibit D] and procedure as detailed in Chapter 6.1.2 and Tables 6-1 and 6-2 of the Plan, Rough Proportionality will be considered by CDFW to be maintained in accordance with the NCCPA.”12

While Tables 6-1 and 6-2 are described as implementation schedules, they are not sufficient to provide any effective basis on which to make a determination of rough proportionality as they fail to specify any "triggers" by which lack of progress would be measured to demonstrate compliance with the “rough proportionality” requirement. Exhibit D may provide the necessary level of detail and will control over Tables 6-1 and 6-2. However, Exhibit D was not released

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11 See IA § 11.1, page 40.
12 See IA § 11.1.1, page 40.
with the *Implementing Agreement* and, as of the filing of these comments, was not publicly available. Until Exhibit D can be reviewed, it is not possible to evaluate whether the implementation schedule satisfies the “rough proportionality” requirement.

As noted above, a critical factor in both the ability to achieve the biological goals and objectives of the BDCP, and the functionality of adaptive management will depend upon clearly defining the water contractors’ responsibility under the BDCP to meet adequate flows that enhance habitat functionality necessary for recovery of covered species. In particular, under terms of the Implementing Agreement and Chapters 3, 7 and 10 of the BDCP Public Draft, it appears that the water contractors’ responsibility for flows is limited to the low outflow scenario (LOS). This condition seems inadequate and contrary to effective adaptive management – which should first seek to assure adequacy of conservation measures – as a prudent operating principle.

While we understand the interest of the water contractors in defining their obligations for flows in the Delta, the lack of “Exhibit D”, and the uncertainty of how threatened and endangered species will respond to conservation actions requires a more prudent response in determining what kinds of flows are necessary to avoid a “jeopardy” determination of species viability, let alone necessary flow regimes to promote recovery of listed species. As proposed, the decision tree framework appears asymmetrical, assuming initial permit conditions require "high outflows" apparently defined as those currently required (under Biological Opinions and other measures) and scientific work under the decision tree process allows one or both spring and fall outflow requirements to change to "low outflows," allowing for increased exports. No provision is made for increasing flow requirements above the BDCP proposed high outflow scenario.  

9. **Governance Features Should Be Realigned to Support Implementation of the Plan**

Numerous scientific, operational, and conservation assumptions pose difficult questions in assuming or projecting that BDCP can achieve its intended objectives.

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13 BDCP Public Draft, Chapter 3, section 3.4.1.4.3
With respect to governance, our concerns center primarily around the role of the Implementation Office and the adequacy of financial resources provided, both discussed below.

10. **The Implementation Office Lacks the Necessary Capacity and Authority to Implement Conservation Measures 2 through 22**

The role of the Implementation Office, headed by the Program Manager and governed by the Authorized Entities Group, is to “ensure that the commitments in the BDCP are carried out in a timely and efficient manner.” Unfortunately, the Implementation Office proposed in BDCP is not designed for implementation. Section 15.0 of the Implementing Agreement describes an organization with no legal status, no full time staff, and no independent budget. The Implementation Office is excluded from involvement with construction or operations of SWP and/or CVP facilities except for assembling information on activities and does not administer the Adaptive Management and Monitoring Program.

While the Implementation Office is tasked with coordinating funding, developing budgets, work plans and schedules, writing reports, and promoting public awareness, the Office has no authority to make even the most minor of decisions or to compel any specific action. Any action ultimately is the responsibility of others.

The Implementing Agreement states that the Program Manager fulfills "the staffing needs of the Implementation Office by drawing from existing personnel at DWR, Reclamation State and Federal Water Contractors Agency (SFWCA), and from other sources." However, it is unclear whether “borrowed” staff are assigned full-time to the Implementation Office, or the duration of their assignment. The size of the Implementation Office staff is left to the Program Manager. Neither the BDCP nor the Implementing Agreement provides any specificity as to the requisite skills for each position – or necessary staffing capacity. Thus, there is no enforceable assurance to guarantee the Implementation Office staff will have both sufficient time and sufficient professional competencies to adequately implement Conservation Measures 2 through 22.

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14 BDCP Public Draft, § 7.1.1.3.
15 See IA § 15.2.4.3, page 58.
The Implementation Office also is charged with ensuring that future public policy decisions do not conflict with BDCP permit terms, a role elaborated on at length in the BDCP Public Draft.\textsuperscript{16} Those permit terms will include critical water operations decisions. Future regulations – starting with Delta flow criteria – and possible future projects – such as expanding Shasta Reservoir – are expected to conform, or align with BDCP objectives after it is permitted.\textsuperscript{17} The skills required for tracking projects which could affect BDCP permits and then for resolving conflicts are quite different than those required to implement a conservation measure. These activities will compete for money and time with the responsibility to complete conservation measures.

The functions of the Implementation Office are likely to require more funding than the projected $336.4 million over the 50 year permit term. These costs are said to be based on a staffing plan developed for BDCP, but no information is provided to justify the 41 to 57 FTE or specific skills identified for the positions.\textsuperscript{18} This sum represents 7.1 percent of the total costs of Conservation Measures 2-11, just one component of the work of the Implementation Office. By comparison, an analysis of grants from the ERP program for seven identified restoration projects in the Delta found that the category of "planning" represented 21.3 percent of total expenditures.\textsuperscript{19}

Section 15.2 of the Implementing Agreement assigns coordination, information gathering and report writing responsibilities to the Implementation Office but no decision making authority to act on information gathered is given to the Implementation Office. Monitoring of performance

\textsuperscript{16} The Implementation Office is charged with representing the permit terms in relationships with other agencies in the BDCP Public Draft, Chapter 6, sections 6.3, 6.4 and 6.5, plus in Chapter 7 sections 7.2, 7.3 and 7.4.
\textsuperscript{17} See BDCP Public Draft, Chapter 6, section 6.4.4: “... new state and federal regulatory requirements are likely to be adopted that affect the Delta, such as new Delta flow criteria issued by the State Water Resources Control Board, or additional water quality criteria issued by EPA... if ESA or CESA compliance is required of a project, an assessment will need to be conducted regarding its consistency with the BDCP. The Implementation Office will work closely with project proponents or regulatory agencies to ensure that the project or new regulatory requirements are consistent with the BDCP.” The extended discussion in this section is more specific than the list of other permits likely to be required found in Chapter 7 at Section 7.1.8.
\textsuperscript{18} See BDCP Public Draft, Chapter 8, section 8.2.4, page 8-52, lines 17-22 and Section 8A.2.1, page 8.A-82, lines 8-10.
\textsuperscript{19} Author’s calculations of costs for grants identified as going to projects in: McCormack-Williams, Suisun Marsh, Liberty Island, Dutch Slough, Yolo Bypass, Staten Island, and the Cosumnes/lower Mokelumne/Grizzly Island complex.
is of little value unless resulting information is used in decision making. As noted earlier, staffing the Implementation Office with no "permanent" employees compromises capacity to implement conservation measures, especially Conservation Measures 2 – 11, which require specific professional competencies. As noted above, neither the BDCP nor the Implementing Agreement specifies the skills required of any position in the Implementation Office. This staffing plan also reduces capacity for effective oversight of progress on those same conservation measures.

Rather than an arbitrary designation or creation of a new Implementation Office, a better and more accountable vesting of authority of an “Implementation Office” would be the establishment of such an office/authority within the Department of Fish & Wildlife (DFW). Such vesting of authority to achieve conservation outcomes within the BDCP would be consistent with the role and responsibility of the Department in implementing other Natural Community Conservation Plans (NCCPs).

Section III - Funding Structure and Cost Analysis

A. Funding Concerns Render Implementation of Conservation Measures 2 through 22 Problematic

BDCP is an ambitious project of multiple components which will be costly to implement. With any project of this scale, uncertainty surrounds estimates of future costs. However, project applicants under NCCP are responsible for accurate projections of the costs of proposed conservation measures and for identifying funding sources. It is important that financing and implementation roles and specific responsibilities of the project proponents and the State of California and the federal government are clearly defined within the BDCP. This is particularly true with regard to the financing of conservation actions included in the plan and the available information raises questions that inadequate financing is available to successfully implement the habitat conservation measures (2-11) proposed in BDCP. From our analysis, three problems are evident:
1. The current cost projections are likely to prove to be too low;
2. Sources of revenues to cover current projected costs are tenuous; and
3. Restoration cost estimates should be based on range of potential costs not prescriptive amounts for conservation measures
4. Cost shares appropriately borne by water contractors may be shifted to public sources unless funding responsibilities are more explicitly defined.

It is particularly important that expectations and roles for long term conservation funding are well-defined within the scope of the BDCP. We underscore this point as it will be important to ensure that the water contractors/Permittees pay their fair share of conservation plan elements, and recognizing that, over time, proposed conservation measures will be modified, some may be abandoned as infeasible, and other measures may be advanced as part of the wider conservation strategies. Additionally, measures within the BDCP may ‘crowd out’ other conservation purposes, adding competition for funds with other public purposes.

B. The Current Cost Projections are Likely to Be Too Low

There is a very high probability that costs estimates provided in BDCP for conservation measures other than Conservation Measure 1, Water Facilities and Operations, are too low and the costs for Conservation Measures 2 - 11 could be significantly higher than those costs projected in the Public Draft. The BDCP cost estimate is inconsistent with other ecosystem restoration efforts in the Delta; inappropriately assigns a fixed value to the cost instead of a more conservative range of anticipated costs; and does not include an appropriate contingency adjustment, considering the high degree of uncertainty surrounding the expected ability of the proposed ecosystem restoration measures to achieve their objectives.

1. Cost Estimates Likely to Prove Too Low: BDCP Proposes Spending Less on Habitat Conservation Measures Than is Currently Spent on Ecosystem Restoration

BDCP proposes to spend $4.4 billion on Conservation Measures 2 through 11 over the 50 year term of the permit, which comes to $88 million annually. However, to put this in perspective,
average annual ecosystem restoration expenditures of $131 million are shown in the last three years (2010-11 through 2012-13) of the "Cross Cut Budget" established under CalFed to track state and federal expenditures on Delta projects. Another way of looking at this is that BDCP proposes to spend about 72% of what is currently being spent annually on habitat projects in and around the Delta. While the recent ecosystem restoration expenditures appear to be higher than historic patterns through CalFed, only limited progress has been made on ecosystem restoration in the Delta. No rationale is offered in BDCP as to how the proposed funding will result in more ecosystem protection and restoration than has been achieved under CalFed and the Ecological Restoration Program administered by the California Department of Fish and Wildlife.

2. **Methodology for Cost Estimates of Restoration Are Ambiguous and Do Not Adequately Incorporate Actual Experiences from Past Delta Restoration Efforts**

Significantly, for Conservation Measures 2 through 11, BDCP proposes activities, anticipated costs and time schedules, without analysis of past efforts in the Delta. Without a baseline analysis of what has been accomplished in the past decades of work in the Delta, with some measures of habitat protected or restored, time required and costs actually incurred, it is hard to project an informed judgment of the potential costs of BDCP proposals. Because of the high stakes in terms of Delta ecosystem function, species survival or recovery, and potential costs to other parties, a proper baseline analysis of past ecosystem restoration efforts in the Delta is essential to informing anticipated costs and schedules under the BDCP.

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20 CalFed ERP reports do not provide a clear accounting of spending on ecosystem restoration, with the most recent *End of Stage 1 Executive Summary* (2010) showing expenditures of $629 million (Table 1, page 3). file:///C:/Users/John/Downloads/End_of_Stage_1_Rpt_Exec_Smry.pdf. However, an earlier analysis by the Department of Finance identified ecosystem restoration expenditures of $907 million through FY 2004. Table 7, page 9. http://www.calwater.ca.gov/content/Documents/CBDA_Fiscal-Review_Final%20.pdf The DOF included expenditures 1996-2000 pre-ROD ($238 million) but also found larger expenditures FY 2000 through 2004 than cited in the CalFed ERP report said to include an additional four fiscal years ($669 million vs. $629 million). The DOF is more authoritative and that number is increased to $1 billion, estimating an additional $93 million over six fiscal years and approximately $88 million annually on "Delta" ecosystem projects over the available history.
The cost estimates characterized in the BDCP are the result of substantial work based on cost models of "other large, complex regional HCPs and NCCPs." Upon examination, however, only two applications of such comparative analyses were found, while others appear to have been made in an ad hoc manner. A few examples illustrate this point:

1. Cost estimates of Conservation Measure 4, Tidal Natural Communities Restoration, used information from completed or recently permitted projects in the entire estuary (e.g., Petaluma Marsh, or South Bay Salt Ponds). The costs for Conservation Measure 4 are projected to be $1,909,700,000 over the 50 year project period.

2. Cost estimates of Conservation Measure 11, Natural Communities Enhancement and Management relied on comparison to other habitat projects. The costs for Conservation Measure 11 are projected to be $217,883,356 over the 50 year project period.

3. The cost factors used for land acquisition (fee simple title or easement) and habitat establishment are particularly risky as they form a large portion of projected total costs. As the projected land acquisition cost estimates for CM2-11 total $998.52 million, an underestimate or overestimate has significant potential consequences.

Cost estimates for the "construction and planting" components of CM10 are attributed to a single personal communication of "comparable restoration projects occurring in and around the Delta (Gause pers. comm.)" by an individual working on mitigation banks. An average cost of $6,625/acre for restoration and revegetation is used with no analysis presented of costs attributed to identified restoration projects to show this is a plausible valuation.

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21 See Draft BDCP, Chapter 8, section 8.2.2, page 8-3, lines 28-31.
23 See Draft BDCP, Chapter 8, section 8.2.3.10, page 8-23, lines 7-9. Publicly available information shows that the firm with which this individual is associated has completed a single mitigation bank of direct relevance, the Cosumnes Floodplain Mitigation Bank of 472 acres for riparian, perennial, and seasonal wetlands for flood mitigation. http://www.wesmitigation.com/pdf/wes-soq.pdf.
No structured analysis of implementation processes identifying lessons from large ecosystem restoration projects appears to have been undertaken in BDCP documents. Some local examples are illustrative of the challenges associated with ecosystem restoration in the Delta.\(^{24}\)

The first stage Ecosystem Restoration Project (ERP) under CalFed made little progress on effective ecosystem restoration of aquatic habitats. The Ecosystem Restoration Program End of Stage 1 report (2010) counts acquisition of Liberty Island and passive restoration of over 1000 acres of tidal perennial habitat as the most notable success, joined with acquisition of Dutch Slough properties with a potential for nearly 400 acres of tidal marsh habitat. The ERP also contributed to restoration and protection of wetlands in San Pablo Bay and Suisun Bay. However, funding from CalFed focused mostly on structural ecosystem remediation projects, such as fish screens or fish passage.\(^{25}\)

Under the “Fish Restoration Program Agreement” (2010) associated with current exports from the Delta, the state and federal water contractors are obligated to create or restore a minimum of 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh, among other actions. The Fish Restoration Annual Report (2012-2013) lists the constraints and impediments encountered in implementing the Program. These constraints and impediments, “all of which are present in the Delta,” (FRPA 2010) include:\(^{26}\)

1. Staff Resources
2. Conflicting Land Use Priorities
3. Land Acquisition
4. Potential Impacts to Neighboring Lands
5. Permitting

\(^{24}\) Planned restorations of large scale estuaries similar to the Delta are rare. Possible analogs in the United States include the Chesapeake Bay, the South Florida (Everglades) Ecosystem, and the Louisiana Coastal Wetlands. All have encountered significant delays, conflicts over goals, strategies and measures of success and cost increases beyond original projections.


\(^{26}\) Ibid., page 13.
6. Scientific Uncertainty

7. Hydrologic and Numerical Modeling

Limited progress has been made on the Fish Restoration Program. $20 million has been spent to date, with in-Delta spending mostly focused on Prospect Island, Suisun Marsh and Cache Slough. However, the largest share of funds, $12 million, has been spent outside of the Delta at Battle Creek, a pattern which also occurred under CalFed.

A total of $205 million is projected to be necessary over 10 years to implement the Fish Restoration Program, which calculates to $25,625/per acre restored, inclusive of land acquisition and all other identified costs. By comparison, the BDCP cost per acre is calculated to be only $14,674/acre.

3. The BDCP Cost Estimates Should Be Based on a Range of Potential Costs, Not a Fixed Amount

Ecosystem restoration efforts in the Delta have rarely reached "completion" at which costs incurred or results are known. Considered within the framework advanced by AACE International (association of professional cost estimators which establishes best practice guidelines and certifies cost estimators) used in BDCP, the uncertainty risks of ecosystem restoration must be recognized as very high, as seen in these guidelines.

Expected Accuracy Range

The accuracy range of an estimate is dependent on risk. A number of characteristics of the estimate input information and the estimating process

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28 The BDCP does not summarize costs into a total per acre. The average cost per acre was calculated as follows: fee title land acquisition from Table 8.2 ($4367), increased by 10% for transaction costs (to $4804/acre), to which restoration costs of $6625 an acre are added, then adjusted by 20% for contingencies (reaching $13,714/acre) to which the projected Implementation Office costs (7% of all restoration costs) are added, to reach $14,674/acre.

29 See: http://www.aacei.org/

are systemic risks. The extent and the maturity of the input information is a
highly important determinant of accuracy of cost projections. There are also
systemic risk factors besides the available input information that also greatly
affect estimate accuracy measures. Primary among these are the state of
technology in the project and the quality of reference cost estimating data.

*State of technology*—technology varies considerably between industries,
and thus affects estimate accuracy. The state of technology used here refers
primarily to the programmatic or technical uniqueness and complexity of the
project. Procedurally, having “full extent and maturity” in the estimate basis
deliverables is deceptive if the deliverables are based upon assumptions
regarding uncertain technology. For a “first-of-a-kind” project – and the
BDCP may well fit this category - there is a lower level of confidence that the
execution of the project – especially at the scale of restoration proposed
within the BDCP - along with all necessary mitigation will be successful

*Quality of reference cost estimating data*—accuracy is also dependent on
the quality of reference cost data and history. It is possible to have a project
with “common practice” in technology, but with little cost history available
concerning projects using that technology. In addition, the estimating
process typically employs a number of factors to adjust for market
conditions, project location, environmental considerations, and other
estimate-specific conditions that are often uncertain and difficult to assess.
The accuracy of the estimate will be better when verified empirical data and
statistics are employed as a basis for the estimating process, rather than
assumptions applied thus far.

Instead of projecting a range of costs reflecting uncertainty and risk, BDCP assumes a fixed cost
for various categories of activities, commonly allocated into one or more of three time periods
over 50 years.31 The methodology for determining cost projections is unclear in the BDCP as
Conservation Measures 2 through 11 are displayed in Excel spreadsheet calculations, but the
underlying basis for various values provided are not defined. The implied precision by
presenting the cost estimate in this manner is seductive, but raises significant questions about
the underlying cost basis and analysis from which these numbers are derived.

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31 See Chapter 8, "Implementation Costs and Funding Sources," Table 8-6 through Table 8-16, corresponding to
CM2-CM11, pages 8-17 through 8-35.
4. The BDCP Cost Estimate Does Not Allow a Sufficient Contingency Adjustment – and May Create Potential for Cost Shifting for Habitat Measures

The 20 percent contingency adjustment applied to most of the BDCP habitat related conservation measures is too low given the uncertainties of ecosystem restoration. The conveyance facilities cost estimate is characterized as a Class 3 estimate and a 35.9 percent contingency is included for construction costs in the BDCP cost estimates. The five point scale is applied to reflect “certainty” calibration with the Class 3 cost estimate at the midpoint in the scale; Class 1 estimates are deemed very accurate and Class 5 estimates are the least accurate, requiring provision of larger contingencies in cost estimates. Given multiple uncertainties about actual restoration costs and outcomes – and the importance of providing for the experimental application of adaptive management strategies -- a more prudent approach would be to apply the Class 5 cost estimate basis until more Delta restoration projects are completed, and more is learned about both effective technologies and costs, including long-term habitat stewardship. Plainly, while the existing worksheet of estimated costs for restoration provides some basis for comparison of different projects, the risks of significantly inaccurate cost estimates are substantial. Standard cost estimates for restoration projects including projections applied by AACE International suggests variances in the range of +100/-50% or even wider.

This analysis suggests that costs projected in the BDCP Public Draft are almost certainly conservative with respect to long range costs of restoration, probably by tens of millions of dollars, and potentially underestimated by billions of dollars. Estimating costs for ecosystem restoration at the scale proposed in the BDCP is challenging as there is little successful experience in the Delta or elsewhere that approaches the complexity, variety and scale.

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32 See Draft BDCP, Chapter 8, section 8.2.2.2, page 8-4.
However, how these cost estimates were developed falls short of standards for open analysis of conservation costs and responsibilities – and lacks a substantive basis to clearly allocate costs and responsibilities to project Permitees and transparently indicate how much responsibility will be absorbed by state and federal agencies.

B. The Assurances Offered in the Implementing Agreement Create Potential for Open-Ended Liability

A critical discussion of costs and funding responsibilities is found at section 13.0 of the Implementing Agreement, where a series of statements attests to the reasonableness of the cost projections and the likelihood that the combination of specified contractor funding, combined with expected state and federal funding is sufficient to provide a basis on which permits can be issued. Provisions in the BDCP may shield contractors from financial risks if the ecosystem restoration conservation measures cost more than projected amounts or fail to achieve projected benefits. Funding responsibilities of contractors are narrowly specified by purpose; amounts to be paid by contractors for other than Conservation Measure 1 are set as absolute limits in several locations in the Implementing Agreement, including sections 13.1.1, 13.1.3, 13.2, 14.0, 14.1, 14.2, and 14.3.3. Similar provisions are in the Public Draft. Those provisions may effectively cap contractor obligations and also serve as an inducement to underestimate costs in the Plan.

The BDCP Public Draft provides an inadequate analysis of sources of revenues to cover projected costs for Conservation Measures 2 - 11, (which as noted above are likely to increase significantly). It is known that many activities undertaken under CalFed and the Ecosystem Restoration Program were funded from bonds where remaining balances are low, and prospects for additional funding in the near term are at best uncertain.35

Recognizing that habitat restoration will be an on-going action under the BDCP, long-term funding including funding from bonds will likely occur on an intermittent basis. It is also likely

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35 According to the LAO, only about 10% of the water bonds approved by voters since 2000 remain unobligated and while proposed bond bills are pending in the legislature, they have not been enacted and require voter approval. See: http://www.lao.ca.gov/reports/2014/budget/resources/resources-environmental-protection-022114.aspx
that other sources including General Fund expenditures will be necessary to meet relatively near-term restoration obligations under the Plan. In order to build public confidence and support for various funding mechanisms, it is necessary to define and provide more explicit assurances about restoration funding obligations that will be absorbed by the water contractors. The cost projections provided raise significant questions with regard to regulatory assurances limiting additional financial obligations of the water contractors.

The water contractors’ funding obligations for all measures, other than CM1, appear to be capped at $903 million. Included within the other conservation measures are actions for which the water contractors would be fully responsible even in the absence of the BDCP. It appears, however, that any cost overruns would become the obligation of the public, resulting in a potential shift of funding responsibility from the water contractors to the public. A full accounting of current obligations from existing Biological Opinions and other measures that are carried forward into BDCP is an absolutely necessary first step in understanding any shifts in payer responsibilities from contractors to the public.36

The state and federal water contractors' obligation for "All mitigation costs associated with the permanent and temporary impacts of construction and operations of the facility (CM1)" is acknowledged.37 However, no listing of those mitigation obligations is provided in the chapter on costs and funding sources. A total cost of $903.3 million (undiscounted 2012 $) is provided for mitigation measures, mostly associated with facility construction. These costs are not identified in the available projection of CM 1 costs although the BDCP states there is some "overlap" with current obligations under BiOps, and also notes that any additional costs associated with mitigation identified in the EIR/EIS or mitigation costs associated with other

36 The water contractors’ obligation to restore 8,000 acres of tidal marshlands as required by the US Fish and Wildlife Service OCAP BiOp offers an example of possible cost-shifting. This action is included under CM4, which anticipates restoration of 65,000 acres of tidal wetlands. Table 8-37 of the BDCP lists the water contractors’ obligations for CM2, CM4-10, CM12, and CM22 collectively at $269 million. Table 8-41 lists the water contractors’ obligation for CM4 as $240.6 million, representing 12.6% of the total cost for CM4, based on a calculation showing that 8,000 acres represents approximately 12.6% of 65,000 acres. If the BDCP truly caps the water contractors’ obligation, any cost overruns that exceed the water contractors’ $240.6 million obligation will be shifted to the public.

37 See BDCP Public Draft, Chapter 8, section 8.3.4.1, SWP and CVP Funding Responsibilities, page 8-73, lines 16-17.
laws or regulations are not included in the $903.3 million.\textsuperscript{38} The text in the "rationale" column of Table 8-41, "BDCP funding provided by participating state and federal water contractors," includes discussion of allocation of some mitigation costs, but not intelligibly.\textsuperscript{39} An accurate identification of mitigation obligations and currently estimated costs is an absolute requirement in identifying total BDCP costs and assigning the uncapped obligation for those mitigation costs to state and federal water project contractors.

Section IV – EIR/EIS

TNC offers the following comments on the impacts of the BDCP on Staten Island and the McCormack Williamson Tract, and the proposed mitigation measures. As set forth in detail below, the impacts are significant, in particular with respect to the Greater Sandhill Crane and other migratory species that use Staten Island. The Draft BDCP and BDCP Draft EIR/EIS do not adequately address impacts to these resources, the farming operations, levees, structures, and residents on Staten Island, or the levees and improvements on the McCormack Williamson Tract.

In addition to TNC ‘s comments below, TNC incorporates by reference the comment letter submitted by Gilbert Labrie, the District Engineer for Reclamation District 38, a copy of which is submitted with these comments.

A. Impacts to Greater Sandhill Crane and Other Species on Staten Island

The BDCP and the Draft EIR/EIS acknowledge both substantial impacts to the Greater Sandhill Crane and other species using Staten Island as habitat, and the high degree of uncertainty surrounding the response of these species to the significant construction impacts expected to occur from locating the tunnels under Staten Island. Given the uncertainties, we feel a more conservative approach needs to be taken (using the precautionary principle) by assuming the worst – that cranes may abandon sites or the island permanently – and appropriate mitigation is essential to avoid this outcome. With this in mind, the most feasible means of avoiding the

\textsuperscript{38} See Chapter 8.3.4.1.2, page 8-77, including footnote 55.
\textsuperscript{39} At pages 8-74 through 8-76.
significant impacts is to realign the tunnels away from Staten Island. However, in the event that Alternative 4 is approved and permitted, and recognizing that construction of CM1 is not likely to occur for several years, we strongly recommend that experimental measures begin as soon as possible to determine whether the proposed mitigation measures will achieve the intended benefit.

1. Background of TNC’s Involvement at Staten Island

Staten Island is owned by TNC and managed by Conservation Farms and Ranches (a non-profit affiliate of TNC) as a diversified agricultural property with a specific focus on testing and implementing wildlife-friendly agricultural practices. Specifically, Staten is one of the most important sites in California for wintering Greater Sandhill Cranes (Ivey and Herziger 2003) and management at Staten is focused on improving habitat conditions for this species. In addition, the island is managed to provide valuable habitat for waterfowl, shorebirds, and other wildlife (Shuford et al. 2013, May and Associates 2003).

TNC acquired fee title to Staten Island in 2001 with two grants of funding provided by the State of California. The California Natural Resources Agency granted California Proposition 204 funds to TNC because the Agency determined that the protection of Staten Island would implement the CALFED Ecosystem Restoration Program by (1) protecting critical agricultural wetlands for continued use by significant numbers of migratory birds; and (2) allowing development and refinement of economically viable wildlife-friendly agricultural practices. DWR granted California Proposition 13 funds to TNC because DWR determined that the protection, management and use of Staten Island for wildlife-friendly agricultural purposes would (1) preserve agricultural land; (2) protect wildlife habitat; and (3) protect the floodplain area from inappropriate or incompatible development.

The land use at Staten Island is restricted by a Conservation Easement Deed granted by TNC to DWR in 2001. Allowing the siting of the tunnels, or any of the related improvements, on Staten Island, as proposed by DWR, would violate the terms of the Conservation Easement, which TNC cannot legally do under the terms of the Conservation Easement. California law specifies that conservation easements are permanent (California Civil Code, § 815 et. seq.). In order to
proceed with its proposed tunnel project, DWR would have to condemn the easement it holds on Staten Island. In an eminent domain proceeding to condemn property that is already in public use, DWR would have to establish that the proposed new use is more necessary than the existing public use (California Code of Civil Procedure, § 1240.60 et. seq.). Ironically, the Department would find itself in the position of having to defend the conservation easement that it is attempting to condemn.

2. **BCDP and the Draft EIR/EIS Do Not Adequately Address Impacts of the BDCP on Greater Sandhill Crane**

The Greater Sandhill Crane is listed as threatened under the California Endangered Species Act (California Department of Fish and Wildlife 2013). Staten Island has a long history of supporting a large and dense population of both foraging and roosting sandhill cranes. Approximately 1,500 Greater Sandhill Cranes use Staten, which is a significant portion of the population that uses the Pacific Flyway, and represents at least 15% of the entire Central Valley Population of Greater Sandhill Cranes (Ivey and Herziger 2003). During the core wintering period from November to January, Staten has been reported to hold over half of foraging cranes using the North Delta region and consistently supports high numbers of feeding cranes through the winter (TNC 2014 *unpublished data*, Ivey and Herziger 2003).

Human disturbances can influence crane selection of roost sites (i.e. Armbruster and Farmer 1981, Norling et al. 1990, Norling et al. 1992, Sparling and Krapu 1994). Highly variable impacts due to additional human disturbance factors, such as noise and lighting, will occur as a result of various construction activities, and these factors were not fully considered in the Draft EIR/EIS in estimating total habitat loss. The Draft EIR/EIS acknowledges the many limitations to our understanding of how cranes will respond to the numerous types of disturbances and habitat modifications that will result from construction activities and post-construction operations and maintenance as a result of implementing the BDCP. As stated in the BDCP “[T]he construction of the conveyance facility will require a substantial amount of heavy equipment over prolonged periods, and is expected to generate noise, require nighttime lighting, and create visual
disturbance” (BDCP Public Draft, Nov. 2013, pg. 5J.D-1). In addition, there will be disturbances from pumping plants to discharge water from dewatering wells.

Given that sandhill cranes are highly sensitive to disturbance (particularly new forms of disturbance to which they have not become acclimated), are highly site faithful, and that there is relatively little information on how they will respond to such prolonged construction activities as anticipated by the BDCP, the precautionary principle dictates that existing roost and foraging sites on Staten may be entirely or largely abandoned. Mitigation for this potential impact needs to be addressed explicitly and include some experimentation to test the effectiveness of the mitigation well before construction begins.

In addition, the loss of habitat needs to be considered as part of the cumulative effects that include the loss of habitat already resulting from land conversion to unsuitable foraging crops that are affecting the forage availability and carrying capacity of the Delta overall for Greater Sandhill Cranes (Ivey 2014). Given the large proportion of Greater Sandhill Cranes that habitually return to Staten Island, the impacts on the island need to be considered in this context, accounting for the cumulative impacts across the Delta. For example, forced movement of sandhill cranes off Staten to increasingly limited areas for roosting and foraging habitat off the Island not only create challenges for ensuring the cranes identify and utilize new habitat management sites, but it also may result in increased competition between geese and cranes when they concentrate where suitable habitat remains undisturbed. The dynamics of interspecific competition from displacement of suitable habitat due to BDCP have not been accounted for.

The combination of these activities over such a large footprint through the densest and most traditional use areas of the sandhill crane in the Delta has the potential to significantly impact the population wintering in the region.

\[ a. \quad \textit{Construction Activities Will Result in Significant Loss of Habitat} \]

Despite the claim that a majority of the habitat loss on Staten would be temporary, the activities, impacts, and footprint described may be significant enough to affect the population
using Staten over the long-term, since there is insufficient evidence in the Draft EIR/EIS that the impacts to cranes have been fully mitigated.

Under Alternative 4 (the BDCP preferred alternative), construction activities would result in significant disturbances, loss of habitat, and alteration of habitat on much of Staten Island. Out of 8,815 acres of modeled crane habitat on Staten, the Draft EIR/EIS estimates that 1,283 acres of permanent foraging habitat and 132 acres of temporary habitat will be directly lost. This represents 47% of the total permanent losses of foraging habitat for the entire project (BDCP Public Draft, Nov. 2013, pg. 5.6-42). The habitat that would be lost has very high value to Greater Sandhill Cranes (Ivey et al. 2011), because of the high forage value of the crops themselves and their location as keystone features in the traditional crane use landscape of the Delta (Ivey and Herziger 2003). The BDCP effects analysis claims that there will be no loss of permanent roosting habitat as a result of BCDP (BDCP Public Draft, Nov. 2013, pg. 5.6-40); however, this does not effectively account for the impact of construction activities planned immediately adjacent to multiple permanent roosting areas on Staten. Furthermore, the Draft EIR/EIS provides no assessment of the habitat impact of building settling/holding ponds and discharging water from dewatering wells, which would severely impair the irrigation capacity for providing forage crops and creating roosting habitat.

Even if construction activities are restricted to the daytime, the disturbance likely would eliminate suitable foraging areas. Loss of this foraging habitat could affect crane use of roost sites (Parrish et al. 2001, Sidle et al. 1993). Data from radio-tagged cranes in the Delta also indicate that cranes sometimes spend diurnal time on their night roosts (Ivey et al. 2011), therefore daytime construction activity could deter them from using the area.

The Draft EIR/EIS also does not adequately address the larger habitat effects resulting from impacts to the viability of Staten Island’s farming operation and irrigation practices, essential for providing suitable crane foraging and roosting habitat on the entire island.
b. Construction Activities Will Result in Fragmented Habitat

The plan does not effectively account for the effects of fragmentation on the integrally connected foraging/roosting habitat network of the Staten landscape and the surrounding area. Many factors influence the distribution of crane roosting sites, including landscape factors such as the amount and suitability of nearby foraging habitat (Parrish et al. 2001, Sidle et al. 1993) and nearby disturbances. This could greatly impact the suitability of roosts for Greater Sandhill Cranes, which prefer to forage close to their roosting sites (Ivey et al. 2011). Habitat changes occurring within the daily flight radius of crane roosting sites may affect crane presence or abundance at roosts, even if local conditions at roosts remain suitable (Shaskey 2012, Ivey 2014).

c. Impacts from Transmission Lines are Not Adequately Addressed

The BDCP and the Draft EIR/EIS fail to adequately consider the impacts of transmission line bisecting crane roosting areas on the northern portion of Staten Island, including the impacts of road construction, road traffic, transmission line construction, and ongoing required maintenance.

Under the preferred alternative, the proposed “temporary” transmission lines on Staten either bisect or are close to permanent crane roosting areas. These lines will be well within the flight altitude of cranes (BDCP Public Draft, Nov. 2013, pg. 5.6-45). These lines would not be removed until after construction is complete (BDCP Public Draft, Nov. 2013, pg. 5.6-45). Cranes could be exposed to further increased risks of striking these new lines if they are boosted from their roosting sites due to nearby construction or maintenance related activities. Pogson and Lindstedt (1988) suggest that deaths due to powerline collisions near roost sites were related to birds’ lack of familiarity with the location of lines. Although the Performance Standard is that there be “no net increase in bird strike hazard to Greater Sandhill Crane populations in the Plan Area” (BDCP Public Draft, Nov. 2013, pg. 3.C-54; emphasis added), there still could be significant increases to the bird strike hazard on Staten Island. The proposed mitigation

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40 In addition to causing increased crane mortality, the lines could also result in increased mortality of other bird species that use Staten habitats.
measure of placing bird strike diverters is not adequate as they are only partially effective in
decreasing mortality (Brown and Drewien 1995), particularly under foggy conditions. New
transmission lines should be placed in lower bird-strike risk zones. While this option is
suggested in the avoidance and minimization measures, the actual plan specifications indicate
lines will be placed in high bird strike risk zones. This conflict needs to be addressed.

Also unknown is how birds will respond to attempts to shift the location of their long-term
traditional roosting sites that are near new transmission lines. Greater Sandhill Cranes have
strong philopatry to traditional use areas, with some individual color-marked birds known to
have used the same local wintering areas for at least 18 years (Ivey and Herziger 2003). Even if
water is moved to encourage roosting in other areas, cranes have habitual flight patterns in the
areas the new lines are proposed.

d. Location of Reusable Tunnel Material Will Interfere with Habitat

The maps illustrating the preferred alternative do not indicate any attempts to minimize the
footprint of reusable tunnel material (RTM) storage areas in crane foraging habitat, even
though Avoidance and Minimization Measure 6 specifically requires that the area used for RTM
storage be minimized in crane foraging habitat and that these areas completely avoid crane
roost sites (BDCP Public Draft, Nov. 2013, pg. 5.6-42). The preferred alternative shows a
significant RTM footprint on Staten Island, in areas with high crane foraging activity that are
nestled between core permanent roosting sites on the island. Furthermore, “there is no
assurance that the material will eventually be moved” (BDCP Public Draft, Nov. 2013, pg. 5.6-42).

e. Some Construction Activities May Occur during the Highly Sensitive
   Wintering Season

It is unclear what construction activities will actually occur within the fall/winter time period of
crane activity, leaving great uncertainty about how severe project impacts will be on the
population. Minimization measures generally state that “construction will be minimized during
the sandhill crane wintering season to the extent practicable in light of project schedule and
cost and logistical considerations” (BDCP Public Draft, Nov. 2013, pg. 3-C-54). This is extremely vague, with no guarantees for what will actually occur during the crane wintering period, especially given the likelihood that cost and logistics will be given high priority. We strongly recommend no project activities occur during the crane wintering period from September through March, as suggested by Ivey and Herziger (2003). Because of the high degree of uncertainty around how cranes may respond, the proposed minimization measure that “construction that cannot be completed prior to the commencement of the wintering season will be started before September 15 or after March 15” (BDCP Public Draft, Nov. 2013, pg. 3.C-54) may not be sufficient. If migrating cranes arrive to new habitat alterations and disturbances on Staten in September, they could respond by avoiding using much of the island.

**f. Impacts from Nighttime Lighting Have Not Been Adequately Addressed**

Many construction activities would need to occur day and night, and “evening and nighttime construction activities would require the use of bright lights” (BDCP Public Draft, Nov. 2013, pg. 5J.D-12). As the BDCP acknowledges, nighttime lighting could boost cranes off their roosting sites and/or significantly affect their quality of nocturnal rest and sense of photoperiod, increasing the risk of transmission line collisions, may affect timing of foraging, and may “interfere with breading and migration (Navara et al. 2007, Titulaer et al. 2012, Santos et al. 2010, Hill 1992)” (see BDCP Public Draft, Nov. 2013, pg. 5.J.D-12). Given the significance of the potential impacts, the proposed use of light barriers to minimize the impact of lighting is not adequate. Mitigation must be based on the assumption that cranes will respond by abandoning these sites.

**g. Impacts from Noise Have Not Been Adequately Addressed**

Construction noise could also cause cranes to abandon foraging and roosting habitat. Construction noise of greater than 50 dBA is expected to extend 500 to 5,250 feet from the edge of construction activity (BDCP Public Draft, Nov. 2013, pg. 5J.D-7). Although artificial noise barriers may be installed to decrease noise levels at foraging habitats, “the visual effects of noise barriers on sandhill cranes are unknown” (BDCP Public Draft, Nov. 2013, pg. 3-C-56). It is
also unclear if there would be combined auditory impacts of pile driving with other construction activities occurring simultaneously.

The Draft EIR/EIS acknowledges an absence of data on the effects of noise on cranes, and “it is not possible at this stage to draw definitive conclusions regarding the sandhill crane response to the increased noise environment expected to be caused by this project” (BDCP Public Draft, Nov. 2013, pg. 5.J.D-10), leaving great uncertainty regarding the scope of the effects and any benefits of the proposed minimization and mitigation measures. Unless work is conducted completely outside of the crane wintering period from September to March, the minimization measures described may be insufficient to mitigate for the negative effects. The combined area of affected habitats constitute most of the island, rendering it virtually impossible to avoid noise impacts to crane habitat on Staten. Because of the potentially significant impacts, we believe that a very conservative approach is needed and mitigation must assume the possibility that cranes will simply abandon the island.

h. Impacts of Long-Term Operations and Maintenance

The effects of long-term operation and maintenance of permanent facilities were also not effectively addressed. “Maintenance of the aboveground water conveyance facilities could result in ongoing but periodic post-construction noise and visual disturbances that could affect Greater Sandhill Crane use of surrounding habitat” (BDCP Public Draft, Nov. 2013, pg. 5.6-44). Avoidance and minimization measures did not directly address long-term impacts of facilities operation and maintenance on the island. The exact timeline and type of effects on Temporary Surface Impact areas were also not explained, as well as any potential long-term impacts on these areas. It is also unclear how long the Safe Haven Work Area will be in use and what long-term footprint it could have. This area is located in the center of Staten Island, immediately adjacent to the core permanent crane roosting area on the island. Also, the proposed tunnel location goes right under some permanent roosting areas. The Draft EIR/EIS does not address what measures will be taken if the underground equipment breaks and digging from the surface is required for repairs at the location of an active crane roost site.
3. Alternative Habitat May Not Be Effective Mitigation

It is also unknown whether the creation of supplemental foraging and roosting habitat would be effective in mitigating disturbance and destruction of habitat during construction, as no evidence was provided on the effectiveness of this approach. The establishment of 700 acres of “supercharged” roosting and foraging habitat will also only occur during the construction period. Greater Sandhill Cranes are very loyal to their wintering sites and less adaptable to change (Ivey et al. 2011) and they have very small winter home ranges, with average flights from roost sites to foraging areas less than 1 mile (Ivey et al. 2011). Thus, there is no guarantee that the cranes will select new roosting sites created just prior to construction. Alternative sites would need to be close enough to existing traditional use areas, near sufficient amounts of suitable foraging habitat, and not affected by significant disturbance in their roosting/foraging landscape. We are also concerned that habitat enhancement on small areas in compensation for larger areas of noise disturbance (0.1 acre of foraging habitat per acre of foraging habitat within the 50 dba noise contour), will be insufficient. For instance, Wang (2011) reported that red-crowned crane movement to a less disturbed area did not mitigate impacts of disturbance, as the concentration of birds in less disturbed areas resulted in continued high levels of vigilance due to intraspecies competition, and thus continued lost foraging time. We recommend that acres of foraging habitat impacted by noise be mitigated at a 1:1 ratio.

The proposed project impact footprint on Staten is so extensive that it could significantly disrupt traditional crane activity patterns on the island. Any mitigation must include early experimentation with creating and testing response to supercharged habitats to test whether birds can be attracted to them. This will allow for critical adjustments to mitigation before construction begins and before significant adverse impacts are realized.

4. Impacts to Other Species

In addition to loss of crane habitat, the proposed BDCP would result in significant loss of habitat on Staten for burrowing owls, Swainson’s hawks, tricolored blackbirds, western pond turtles, and white-tailed kites, as well as other species that use the island (May and Associates 2003, Shuford et al. 2013). In particular, the plan’s preferred alternative has significant permanent
impacts to many acres of burrowing owl habitat, including being immediately adjacent to or burying some recently and regularly active burrowing owl nest sites on Staten. The project footprint has a significant effect on existing interior dirt levees, some of which are actively used by burrowing owls. The construction activities would remove occupied habitat, displace nesting and wintering owls, and/or fragment occupied habitat. Long-term maintenance and operation of conveyance facilities, with associated rodent abatement programs around conveyance facilities, could also have deleterious impacts to burrowing owls. The Draft EIR/EIS erroneously claims that no burrowing owls have been found on Delta islands. On the contrary, over many years Conservation Farms and Ranches personnel have regularly observed burrowing owls nesting on levees within Staten Island. Additionally, the proposed project plan would cause permanent and temporary loss of Swainson’s Hawk foraging habitat and increased impacts of disturbance on their foraging and nesting areas. Proposed powerlines and construction activities bisect known foraging and nesting areas for Swainson’s Hawks on Staten Island.

B. Impacts to the Staten Island Farm Operation

The proposed BDCP design will also severely impair the larger farming operation on Staten Island and the viability of the majority of the island to be farmed in the future. These effects have not been properly accounted for. It would be impossible to continue a viable agricultural operation on the island with the proposed project footprint and associated activities. This would significantly impact the ability of the farm to provide wildlife habitat — including for crane foraging and roosting habitat — on the island as a whole. Some of the major issues and impacts of the proposed BDCP on the Staten Island farm operation are summarized below.

1. Flooding and Irrigation

There is no explanation of how flooding and irrigation capacity will be maintained during and after project activities, however at least 19 miles of irrigation and canal ditches on Staten would be affected by the proposed project. Water delivery to fields would be impaired, as well as the movement of high water away from crops. Avoidance and minimization measures say to “stage CM1 activities on Staten Island such that they do not disrupt flooding and irrigation to the extent that Greater Sandhill Crane
habitat will be reduced during the crane wintering season” (BDCP Public Draft, Nov. 2013, pg. 3.C-59). However, flooding and irrigation capacity for the island would also need to be maintained outside of the crane wintering season in order to grow the crops that provide crane habitat. The project would require farm fields to be re-leveled and the irrigation system would need to be redeveloped for the whole island in order for the farming operation to continue. This would be an extremely high cost.

2. Pumping Structure and Dewatering

There is no indication on how the pumping structure of the island would work under modified conditions, and how dewatering would effectively be accomplished during tunnel construction. Pumping would be required 24 hours/7 days a week due to the high water table. The impacts of dewatering the island were not addressed, and methods for irrigating crops and providing habitat while dewatering were not presented. There was no explanation of the size, location, and magnitude of dewatering and leeching ponds, their associated impact on habitat and farming capacity. There was also no assessment of the potentially significant impact that dewatering could have on the organic peat soils and further subsidence. In addition, access to residential well water for the many residents on the island would be impaired, and it is unclear how this would be remedied.

3. Impacts from storing Reusable Tunnel Materials

It is unknown what, if any, areas can effectively be restored to preconstruction conditions and whether RTM can eventually be removed. Assuming that viable soil for farming could even be returned to the high RTM areas in the future, it may be impossible to effectively irrigate those high plateaus. The Draft EIR/EIS does not analyze whether, if the RTM can be eventually removed, there may be any permanent impact on the storage area. Significant compaction of peat is likely. The Draft EIR should consider the feasibility of bringing in organic peat suitable for farming from other areas to the island.
4. Other Construction Impacts

The proposed location of the conveyor belt through Staten Island would impede a majority of the agricultural operations on the island. The impacts of the associated structures and required maintenance of the conveyor have not been addressed. The impact of increased road traffic, new road construction, and transmission line construction on the operation and activities occurring at the grain silos and dryer have not been addressed. The proposed alternative shows these construction activities occurring adjacent to these essential farming facilities, which could have severe impacts to the farming operation. The Draft EIR/EIS does not address the potential risk of bentonite leaking to the surface as a result of the proposed subsurface tunneling project. This has been observed with other subsurface tunneling work in the area (i.e. McCormack Williamson Tract). Bentonite leakage could contaminate the soil and render the ground unsuitable for farming.

5. Impacts from Increased Salinity

The effect of increased salinity of irrigation water on the continued viability of the farm operation on Staten has not been addressed. Salinity levels are expected to increase throughout the Delta and salinity will move inland as a result of new North Delta diversions. This will compound with sea level rise and decreased upstream runoff already occurring due to climate change, causing the low salinity zone in the Delta to migrate even further east and upstream. The State is required to assure that water quality is adequate to fully protect existing agricultural uses in the Delta; however, further salinity impacts are highly likely with climate change and sea level rise.

C. Impact on Levee Integrity and Flood Risk to Staten Island

The EIR/EIS does not analyze the effects that the large subterranean tunnels and their construction could have on the integrity of the perimeter levee that protects Staten Island. Any compromising of levee integrity would cause significant risks to island residents, the viability of the farming operation, and the maintenance of suitable habitat for sandhill cranes and other wildlife on the island. There are also numerous features proposed to be constructed on or
adjacent to Staten levees (i.e. shaft, roads, temporary transmission lines, temporary surface impacts, and a barge unloading facility), however the impact of these features on levee integrity and continued levee maintenance has not been evaluated. Also, the BDCP does not address how much additional agricultural land could be lost due to levee strengthening and maintenance activities that would be necessary due to the project.

Changes in the groundwater table could affect levee foundations, particularly where there is underlying peat. All alternatives involving tunneling under Staten could impact levees in the southern end of the island, which are the most vulnerable.

D. Impact to Staten Island Residents

With such intense multi-year construction activities occurring on Staten, the effect of emissions and construction dust on the health of both people and wildlife living on the island have not been addressed. There are many families with children living on the island, and nearly all of them are long-term island residents. According to the project footprint, three homes on Staten Island would have to be removed. Several additional houses are located immediately adjacent to areas where several types of heavy construction activities are proposed. These activities would cause severe disruptions, increased health and safety concerns, and significant reductions in the quality of life for those island residents. Also, what other risks would be posed to the houses located adjacent or near construction activities?

Overall, the preferred alternative (Alternative 4) would have significant negative impacts to the wildlife habitat, farming operation, and residents of Staten Island.

E. McCormack-Williamson Tract (MWT) Potential Impacts of Concern Related to the BDCP

McCormack-Williamson Tract (MWT) is an approximately 1,600-acre “island” in the North Delta. TNC purchased MWT in 1999 using federal funds granted from the US Fish and Wildlife Service to TNC through the CALFED Bay Delta Program. When TNC purchased MWT it also became the sole landowner in Reclamation District (RD) 2110.
MWT is protected by approximately 8.8 miles of non-project levees and has flooded several times over the last few decades. Due to its location, geography, and ecological history, MWT has been viewed as a prime site for restoration of fresh water tidal marsh, seasonal wetlands and riparian forest.

TNC and RD 2110 are collaborating with DWR to complete planning and permitting for the MWT Levee Modification and Habitat Development Project (LMHDP). LMHDP objectives include improving flood control in the North Delta and benefiting aquatic and terrestrial habitats, species and ecological processes. DWR has executed a Project Funding Agreement with RD 2110 to complete LMHDP planning, design, and permitting.

The LMHDP design includes removing portions of the MWT levee system (see North Delta Flood Control and Ecosystem Restoration Project FEIR Alternative 1-A) to tidally inundate the interior. BDCP Alternative 4 includes a tunnel alignment, safe haven work area, and temporary access road through the MWT interior (see Draft EIR/EIS Chapter 03, Figure M3-4: Sheet 5 of 15). The Draft EIR/EIS has not adequately addressed the potential conflicts between these two projects.

1. Inundation Following Construction of LMHDP

An analysis of MWT topography and tidal influence indicates that most of the MWT interior would be inundated at the mean tide level following levee removal. The area inundated will include the area proposed for the tunnel alignment, safe haven work area, and temporary access road indicated in BDCP Alternative 4 for the MWT interior. Assuming LMHDP construction proceeds in advance of any potential work on the BDCP tunnels, DWR needs to address the apparent conflict between the proposed BDCP Alternative 4 features and inundation anticipated on MWT following LMHDP construction.

41 http://www.water.ca.gov/floodsafe/fessro/levees/north_delta/docs/
2. **Impacts to Levee Stability**

TNC’s understanding is that construction of the tunnels proposed by BDCP Alternative 4 would likely affect surface elevation along the tunnel alignment (e.g., subsidence associated with dewatering during tunnel construction). Subsidence of levees over the tunnel alignment could increase levee management costs and even cause a levee to fail. The Draft EIR/EIS needs to address how tunnel effects on levees will be resolved.

3. **Impacts to Transmission Tower Stability**

An existing transmission tower on MWT is directly in the path of the tunnels proposed by BDCP Alternative 4. That tower (approximately 2000 ft. in height) is supported by several guy wires. Subsidence due to tunnel construction could impact the transmission tower, its operations building, and guy wire anchors. The Draft EIR/EIS needs to address how tunnel effects on buildings and structures will be resolved.

F. **Summary of EIR/EIS Comments**

In summary, the Draft EIR/EIS is incomplete and inadequate. The high uncertainty surrounding the sandhill cranes’ potential response to the extensive disturbances on Staten Island render the potential impacts significant, without sufficient knowledge regarding whether the proposed minimization and mitigation measures, in particular the creation of new habitat, will accomplish their intended purpose. If Alternative 4 is approved and permitted, experiments with the proposed mitigation measures must take place as soon as possible, before any construction activities begin.

In addition, the Draft EIR/EIS fails to adequately identify potentially significant adverse impacts to levees and infrastructure due to construction of any of the tunnel alternatives, or the potential consequence due to the increased risk of flooding, if levee integrity is compromised in any way, over even a small segment. The lower end of Staten will be significantly, and adversely, impacted during construction of any of the tunnel alternatives, with potential unmitigateable long term consequences to the levee and drainage systems in the area.
Literature Cited


California Department of Fish and Wildlife. 2013. State and federally listed endangered and threatened animals of California. Sacramento, CA, USA.


