

Comments on the  
BDCP Effects Analysis-  
*Appendix A: Conceptual Foundation and  
Analytical Framework  
and  
Appendix B: Entrainment*  
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*Prepared for: Local Agencies of the North Delta*

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## OVERVIEW:

Over the last three years, participants and observers of the California Department of Water Resources (DWR) and federal Bureau of Reclamation's (BOR) Bay Delta Conservation Plan (BDCP) have identified what appeared to be confusion regarding the plan's purpose and direction, inconsistencies in the analysis, and problems with the plan's technical feasibility. The confusion, inconsistencies, and problems lead to many discussions in the Schwarzenegger administration Steering Committee meetings, numerous questions and comments to the BDCP's environmental consultants, and later under the Brown administration, questions directed to the Natural Resources Agency or the management committee.

In their simplest form, the confusion and questions largely rested on the BDCP's premise that exporting up to half of the water from the Sacramento River out of the watershed from the upper San Joaquin-Sacramento River Delta (Delta) would "help" or "save" the Delta. The proposed 15,000 cfs export flow and the creation of a massive new infrastructure in the Northern Delta would have massive immediate and long-term negative effects on the existing aquatic and terrestrial ecosystems, while the hoped-for ecological benefits to the South and Central Delta from the project are simply inferred and deferred to phases long after the project benefits for the exporters have occurred. The BDCP describes this premise more artfully:

"The Bay Delta Conservation Plan is designed to achieve the co-equal goals of providing for the conservation and management of aquatic and terrestrial species, including the restoration and enhancement of ecological functions in the Delta, and improving current water supplies and the reliability of delivery of water supplies conveyed through the State Water Project (SWP) and the Central Valley Project (CVP).<sup>1</sup>"

Initially, this intent appears reasonable. Southern California and the San Joaquin Valley are reliant on water from the Delta to some degree because they have already fully exploited their local water supplies, and there has been a significant decline in fish species (pelagic organism decline [POD]) that had resulted in various court orders to protect those species, often through water export restrictions. However, when reviewed even in a cursory manner, the proposed plan and its associated planning process to achieve those co-equal goals go far beyond that reasonable premise into a proposed project with minimal scientific and legal foundation.

The co-equal goals thereby become a marketing fiction, predicated on "improving current water supplies and the reliability," as if those goals were on equal legal footing to the Federal and State Endangered Species Act (ESA). There is no provision in the ESA that permits the particular interests of a project applicant to trump ESA requirements. Indeed, DWR and BOR, and their State and Federal Water Contractors had no interest in the co-equal goals until the courts required restrictions on export pumping under the ESA. Nevertheless, the need for secure water supplies, to the extent that is possible, and the need to protect species that are at risk of extinction, are both compelling social and legal issues that require some solutions.

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<sup>1</sup> <http://baydeltaconservationplan.com/Home.aspx>

## I. The Plan

Part of the scientific logic problems with the BDCP are directly caused by the pre-determination that the project would include: 1. a series of 5 intakes, each 20 times greater than the next biggest intake in the upper watershed, 2. a massive canal crossing several major rivers on its way to the existing southern Delta project pumps, and 3. the ability to export a total of up to 15,000 cfs (equal to the South Delta pumping facilities) from intakes concentrated in one reach of the Sacramento River without regard to the resulting ecological and hydraulic effects. Later ecological justifications for building that infrastructure were created, and then finally a scheme for “improving” the Delta’s aquatic habitats for a listed fish, the Delta smelt, was presented. Almost a year after those project elements were outlined, a scheme for protecting terrestrial resources such as plants, animals and birds was developed. The BDCP Environmental Impact Report is intended to provide only programmatic (broad) coverage under the California Environmental Act (CEQA) for the “habitat” and project-level coverage for the water diversion and conveyance.

The scale of both the conveyance and habitat elements of the BDCP were defined prior to any threshold analysis to examine the relative benefits and impacts associated with these project elements. While it may in some limited cases be appropriate to set upper and lower bounds to help define the analysis, there needs to be a sensitivity analysis for each measure to see under what conditions it benefits or does not benefit a given species. This is how the effectiveness of the conservation measure is determined, and provides the foundation for determining if a proposed conservation measure should be kept, discarded or modified. For example, the BDCP instead predetermined the proposed North Delta diversion as a conservation measure, and then not did not reassess that and other measures to identify if there were particular thresholds that may be more effective or less effective for conservation.

An added problem is that the purported ecological benefits from the BDCP to listed fish are unclear at best, particularly given that the food chain that the fish are dependant on has almost entirely changed due to invasive clams (reduced phytoplankton), and the direct loss of high value fish food species (zooplankton). The BDCP does not address these fundamental aquatic ecosystem drivers, instead offering the creation of additional aquatic habitat in hope of long term benefits. Even that habitat plan, however, is being reviewed on a strictly programmatic level, and will need significant further review and analysis before it can be implemented. Meanwhile the diversion, storage, and conveyance project is highly detailed and ready to implement once the permits are issued. This sequencing indicates that the water reliability is actually more “co-equal” than the habitat improvements. Indeed, the standard project mitigation for the loss of the existing riparian and terrestrial habitat for the construction of the 5 intakes, two roughly mile-square storage areas, and the canal<sup>2</sup> appears to be conflated into some public “benefit-public pays” Habitat Conservation Plan (HCP<sup>3</sup>) and Natural Communities Conservation Plan (NCCP<sup>4</sup>).

HCPs are ordinarily developed by landowners and/or local governments planning to complete a specific project on their land, or to allow a class of similar activities over a large area, which is

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<sup>2</sup> A tunnel or pair of tunnels that would replace the aboveground portions of the project, the canal, have been proposed and supported by some landowners and terrestrial habitat advocates, since it has less aboveground effects. Various cost projections differ as to the economic cost of either major alternative, largely it seems by no including mitigation and mitigation endowments for the canal.

<sup>3</sup> [http://www.fws.gov/endangered/esa-library/pdf/HCP\\_Incidental\\_Take.pdf](http://www.fws.gov/endangered/esa-library/pdf/HCP_Incidental_Take.pdf)

<sup>4</sup> <http://www.dfg.ca.gov/habcon/nccp/>

likely to result in take<sup>5</sup> of listed species. In this case, the unscreened south Delta intakes currently “take” listed species, and the proposed project construction and the new project operations are also expected to “take” listed species.

The HCP-NCCP recovery standard and the need to use the best available science ensure that a project proponent can not simply drive a species (or several species) into extirpation or extinction, while claiming consistency with the HCP-NCCPA. Any project that proposes to move forward on the project without fully developing and permitting each the elements that make it a HCP-NCCP is not scientifically or legally defensible.

In the case of the BDCP, in a novel re-interpretation by DWR and BOR, most of the land proposed for BDCP’s activities is owned by private individuals who have had no decision making role in the development of the HCP or proposed role for its governance. These same lands are also within the planning area of the 5 existing or proposed HCPs managed by local agencies. According to the November 2010 Working Draft of the BDCP, only approximately 6% of the acreage identified for habitat creation is available on publicly owned lands. Similarly under the NCCP, the very first step in the process is a planning agreement: “Planning agreements are developed with interested jurisdictions, landowners and other interested parties.<sup>6</sup>” The interested affected jurisdictions, namely counties and water/reclamation districts were not part of the planning agreement, nor were any landowners. Further, the BDCP failed to follow the NCCP’s 2003 summary of “lessons learned” including:

- Involve All Affected Parties
- Anticipate all interests that may be affected
- Bring them in early, before any commitments are made
- Create an atmosphere of trust
- Foster “ownership” in the process by local interests
- Local land use authorities (cities, counties) must be involved

The BDCP and its processes have failed to follow the standard and most basic procedures used in HCPs and NCCPs. DWR and BOR must revisit and commit to the standard HCP-NCCP process and learn from the challenges that this project has run into already, and be informed by the lessons already well-understood from other planning processes, such as the Chesapeake and Everglade restoration processes. As stated earlier the needs for an effective set of solutions to address water reliability and extinction risk are needed. An effective process is also much likelier to achieve a financially, politically and socially sustainable outcome.

In addition to re-visiting the planning and process elements of how to complete a plan, the BDCP needs to examine the scientific foundation of the establishment of a HCP-NCCP.<sup>6</sup> A well-established and logical path for establishing a habitat or species improvement plan is to assess what the ecological needs for the species are, assess and weight the reasons for the apparent species or habitat decline, and then and only then identify which of those threats can be managed

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<sup>5</sup> Endangered Species Act defines take as: harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species.

<sup>6</sup> <http://www.nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=6432>

for in a series of conservation measures. The following schematic describes this process in its crudest form:

Identify problem(s) > Assess potential means for improvement(s) > Develop conservation measure(s) > Re-assess

This may appear to be overly simplistic (and it is), but it is the logical foundation for recovery plans. Here, the BDCP devised a proposed project, and then attempted to create ecological justifications for the project, and further conflated its *project* mitigation into the plan as conservation measures. The “Options Evaluation” process by which new isolated conveyance was selected in 2008 does not by any stretch of the imagination follow this logical approach. (See <http://baydeltaconservationplan.com/BDCPPlanningProcess/BackgroundDocuments/OptionsEvaluationReport.aspx>; see also [http://baydeltaconservationplan.com/Libraries/Background\\_Documents/Executive\\_Summary.sflb.ashx](http://baydeltaconservationplan.com/Libraries/Background_Documents/Executive_Summary.sflb.ashx), pp. ES-12 to ES-13 (summarizing results of limited “four dot” analysis).)

The BDCP’s overt assertion that- the proposed project is the solution to the Delta’s problems, while underemphasizing impacts of current Project operations, and obscuring the need for mitigation for the impacts of the proposed project was evident from the very beginning of BDCP process. The last minute afterthought of the protection of terrestrial species is evident throughout the last year of analysis, and all of the current detailed measures (including the Effects Analysis) still focus on fish species that limit full use of the existing south Delta project intakes.

To summarize, the only legitimate analysis from a scientific perspective is one that considers the individual species’ needs, the population dynamics, the expected habitat trajectories; and then determines through careful analysis of the multiple variables, which conservation measures implemented in what fashion, over what period, and where on the landscape, can actually increase (by some conservative amount) the species viability. The purported “iterative nature” nature of this process, while accurate in a technical sense, is in fact currently being used by BDCP proponents to confuse the origins of the “conservation measure”, arguing that the proposed project somehow didn’t come first.

## EFFECTS ANALYSIS

### I. Process Comments

The Effects Analysis is the first major work product of the BDCP under the current administration. The analysis was focused on aquatic listed fish species, again, and should be retitled to “Aquatic Effects Analysis.” The Effects Analysis was also provided to a new panel of scientific advisors for review. The BDCP’s independent scientific advisory panels have repeatedly provided a clear set of analyses and consistent framework to assess potential project data gaps and logic challenges. The BDCP has had a series of recommendations from its Independent Science Advisors (ISA) and the National Academy of Sciences- National Research Council, and even recommendations made by Dr. Dahm, scientific advisor to the Delta Stewardship Council (DSC), the vast majority of which have gone unacknowledged. Various other technical experts have also provided technical comments directly to the BDCP, and no response to these comments has yet been provided.

In addition to essentially ignoring outside scientific concerns, the BDCP has still not discernibly taken into account local public stakeholder comments. The public participation process has no credibility or value to the participants if comments have no disposition. The scientific process demands technical responses to scientific considerations, which is the purpose of the standard, to identify and use the best available science, not ignore countervailing scientific citations and rely on non-scientific justifications.

To that end, numerous parties have repeatedly requested to be involved in and be able to provide peer-reviewed scientific evidence to the ISA and to the ad-hoc advisors. These requests have often gone unacknowledged, and have not been permitted under this administration. Failure to allow countervailing opinions, and provide the scientific advisors the full range of scientific information in an attempt to drive the outcome is a fatal flaw in this process and should be corrected immediately.

## II. Specific Comments on the Effects Analysis- Appendix A

The Effects Analysis was again replete with the project confusion described earlier, specifically the confusion about what is the project that will conserve listed fish, and what is mitigation for that project. The habitat creation described by the BDCP would mitigate for the habitat destroyed by the proposed project (including both conveyance facilities and habitat creation). The fact that the BDCP appears to cause significant “take” even despite the provision of mitigation is evidence that the proposed project (conveyance and habitat creation) are not in fact conservation measures as defined in the ESA.

A long-standing flaw at the core of the effects analysis is the use of Delta Vision as either an plan that lead to BDCP, or some sort of regulation or law; Delta Vision is neither (A-3/A-11). Delta Vision findings have no force of law. BDCP was not developed outside of the diversion, conveyance, and storage proponents, and this is clear because the proposed project as a conservation measure would never be considered otherwise, and the other conservation measures proposed have almost no supporting analysis. It is obvious to most scientists and local residents that BDCP’s highest likelihood of improving conditions for listed fish lay with the measures given the lowest analysis: those addressing invasive plants and animals.

The effects analysis also brings to the forefront the need to further refine and validate the various models that are used to complete the analyses (A7). Despite hundreds of millions of dollars invested in research in the Delta and model development, there is very little to show in terms of how to apply that understanding, namely how much does each variable influence the survival outcomes for targeted species? This is crucial to moving the BDCP process forward, and critical to the success of any project success. Transparent, effective models lead to common understandings and sometimes creative solutions.

In the broadest sense, the presentation of model runs gives the appearance of substance without providing logical rationale in terms of differentiation between the alternatives, little the degree of accuracy or precision of the analysis, or anything in regards to the sensitivity of the analysis. Where are the assumptions? What thresholds were discovered during the modeling? In addition, this dart-throwing process of looking at wet vs. dry years and showing some graphs of postulated outcomes is not a substitute for a directed scientific investigation that is specifically intended to

provide key decision points for adaptive management. The models at best look back into time by using particular historic water years; adaptive management needs to make decisions looking forward into uncertainty (A8).

Adaptive management is not supposed to be a substitute for knowledge or understanding or the failure to collect critical information in advance of an action: “Adaptive management of the BDCP will refine and test those expectations require monitoring, research and management experiments designed to test and refine the working hypothesis posed by the BDCP and allow the region to navigate through an uncertain future (Lee 1993)” [sic] The project cannot defer understanding of the potential and likely effects of the project and the conservation measures until the impacts occur at some point in the future.

The Relationship to Other Plans and Policies (A-11) fails to even identify the 5 other existing or proposed HCP-NCCPs, any County General Plans or policies, or any Federal species recovery plans. The same level of detail is missing from the Pelagic Organism Decline (POD), namely “cherry picking” citations<sup>7</sup> that do not identify the projects as a potential source of the POD, and even using citations that were roundly discredited in the National Academy of Sciences presentations (A-16).

Given that the sharp species decline occurred over a century after levees were built in the Delta, and decades after the wastewater treatment plants were commissioned, recent habitat decline and wastewater treatment appear minor factors in the POD, yet the BDCP focuses on those issues and not assessing and mitigating the relative impacts from the projects that comprise the BDCP. Indeed, land use is cited as a factor (A-17, A-21) although land use in the primary Delta has remained static for decades. What has changed includes invasive species, including zooplankton and clams, and the volume of Delta exports to Southern California during the POD. The continued use of un-cited and technically unsubstantiated declarations is not acceptable in a technical document. For example, “In addition, diversions both in tributaries and in the Delta remove a significant proportion of total available water.” (A-21). How much water, in what water year, is consumptively lost in the tributaries and how much is exported and is proposed for export by the BDCP? This unsubstantiated and apparently unanalyzed assertion is typical of the limited technical depth provided in this section. A substantive analysis would provide technical citations, the assumptions used in the model, the expected error range, and an actual analysis of the seepage-evaporation (carriage) losses from the current conveyance, and the modeled losses from the proposed project alternatives, and the proposed habitat acreage evaporation and transpiration (E/T).

Additionally, the conceptual figure (A-28) that apparently is the foundation for the entire analysis describes the only impact or driver on Adjusted Potential is Land Use. This is clearly incorrect and again uniformly unsupported by the science. It should state Water and Land Use for any credibility. Climate and geology drive the biogeographic potential, it is not independent. Marine influences are limited factors and then only for certain species, at certain life stages, not a driver for “Species and Biological Communities.” Future potential is bi-directional, not uni-directional towards Adjusted, and no “enhancers” are described. Is the purpose of the diagram to illustrate

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<sup>7</sup> Again identified by the ISA, NAS, and again by the Science Panel, the BDCP needs to detail why it is not using citations that would be expected by other professionals and defend why it is relies on certain selected conclusions over others.

that the BDCP would only have benefits that would improve conditions relative to current conditions? That is not supported by the data presented in the chapter.

The same clear bias in favor of the project is shown by the arrows shown within that circle. For example, where are the NAS process drivers? Altered flow should include altered timing and volumes, and that radius should clearly include all of the “other stressors” that the BDCP has already identified.

### III. Specific Comments on the Effects Analysis- Appendix B

The Effects Analysis itself demonstrated the foundational scientific problem with the BDCP: *“Entrainment of delta smelt at the south Delta export facilities may generally decrease under BDCP relative to existing biological conditions, although instances of increased entrainment are also possible.”*<sup>8</sup> While the “study” was a black box analysis with no parameter or model initial conditions provided for independent review, the BDCP’s own model result was that the BDCP may general decrease entrainment on Delta smelt or in fact increase it. This is unacceptable.

The Effects Analysis also misstates the relative contribution to take of listed species by small agricultural intakes within the Delta. Scientific studies have consistently concluded that “small agricultural Delta agricultural diversions are likely to have a minor effect on pelagic (open water) fish, such as the [D]elta smelt.”<sup>9</sup> As a result, larger diversions (such as those over 250 cfs), have been the focus for consideration of screening by the agencies responsible for fish. Thus, prioritization of those screening projects with the most potential to benefit target species is essential. The Effects Analysis is simply wrong in Section B.3.10 (actually described in B.4.4.3) to attribute significant take numbers to these small intakes. Moreover, it is incorrect to assume that land conversion to other wetland types will not require continuing use of existing (or new intakes), as creation of habitat will require significant water supplies.

As with Appendix A, the details of the model assumptions and scientific evidence that significant take is associated with small intakes are not provided. The point of this “analysis“ appears to be a conflation of project intake mortality on listed fish species with the well-studied and described insignificant impact from small Delta intakes. Equally concerning is the statement that a 16.6% reduction of intakes in the ROA could be removed for the purposes of habitat conversion (B.4.4.3.1). It is ridiculous that the intakes of similar (unstated) size, with the “lowest magnitude” of impact and the “lowest certainty,” with a suggested minimal population-level effect, should then be considered a significant cause of take by the BDCP. This pointless exercise typifies the scattershot approach taken in the Effects Analysis. There are also significant problems with the both the description and the underlying concepts of Section B.0.1 Table B-2. The use of a symbol instead of the actual estimated percentages is unnecessarily confusing; this table should be revised to include actual percentages or ranges of percentages that apply to each item. The timing, extent and degree of South Delta and North Delta interoperation should also be described.

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<sup>8</sup>[http://www.deltacouncil.ca.gov/sites/default/files/documents/files/BDCP\\_Effects\\_Analysis\\_Review\\_Overview\\_of\\_Draft\\_Appendix\\_B\\_Entrainment.pdf](http://www.deltacouncil.ca.gov/sites/default/files/documents/files/BDCP_Effects_Analysis_Review_Overview_of_Draft_Appendix_B_Entrainment.pdf)

<sup>9</sup>Ecosystem Restoration Program, Ecosystem Strategy for Stage 2 Implementation Sacramento San Joaquin Delta Ecological Management Zone (July 21, 2010), available at: [http://www.deltacouncil.ca.gov/sites/default/files/documents/files/ERP\\_Excerpts\\_for\\_3rd\\_Staff\\_Draft\\_Delta\\_Plan.pdf](http://www.deltacouncil.ca.gov/sites/default/files/documents/files/ERP_Excerpts_for_3rd_Staff_Draft_Delta_Plan.pdf), citing Nobriga et al. (2005) available at: <http://www.fws.gov/stockton/afwp/SWRCB/12.%20Nobriga%20et%20al.%202004.pdf>.



The assertion that the North Delta intake screening would function perfectly for the life of the permit is also unsubstantiated. A fine slot metal screen placed in the flow of a major river will get eroded by sediment drawn into the intakes, direct sediment impingement on the screen and that associated erosion and mechanical damage, and woody debris and human associated debris impact damage. That damage individually, and in aggregate, leads to increased impingement and reduced screening effectiveness. The reduced efficiency is difficult to detect and measure, and in practice only grossly damaged screens get replaced. Each of these points assumes that the intake was designed, installed, and operated correctly. That is often not the case. The “stacking” of each of these reductions of idealized efficiency must be calculated and analyzed, however ultimately the analysis cannot rely on absurd assumptions.

## CONCLUSIONS

The fundamental premises of the BDCP analysis and the a-priori determination of the conservation measures must be re-examined. In particular, a detailed review of the ecological problems threatening fish, wildlife, and their associated habitats of the Delta and the relative effects of each of the potential conservation measures (individually and in aggregate) on each of those problems must be completed *before* conservation measures are selected. Appendices A and B fall far short of the level of analysis, transparency of basic model assumptions and conditions, and scientific foundation needed for a proposed project of this magnitude. As a result, the Effects Analysis chapters should be re-written to address these concerns.