



*** MEMORANDUM ***

June 29, 2011

FR: Gary Bobker, The Bay Institute

TO: BDCP Goals and Objectives Science Advisors Panel, c/o Bruce Di Gennaro

RE: Science Advisors Draft Report on BDCP Goals and Objectives for Covered Fish Species – Draft Final June 2011

The Science Advisors Draft Report (Draft Report) represents an excellent start towards identifying specific, measurable, achievable, and relevant objectives to guide the construction and implementation of the BDCP conservation strategy. It provides valuable guidance on how BDCP can construct additional objectives for the species discussed in the Draft Report and for other BDCP “covered species.” All of this was accomplished by a small set of scientists from outside the Bay-Delta region, in a short time, and with minimal opportunity to interact face-to-face or with experts in the regional biota. We very much appreciate the effort, knowledge, and skill that are obvious throughout the Draft Report, which should now serve as a beacon to BDCP as it strives to complete the essential task of identifying relevant goals and specific objectives underpinning its Conservation Strategy.

The Draft Report reveals several important attributes of the process behind formulating BDCP goals and objectives process, including:

- The Draft Report demonstrates that it is entirely possible to develop specific, measurable, and achievable objectives that are relevant to the general recovery goals for covered aquatic species¹. This is a key point as the BDCP process has

¹ The Science Advisors did not identify a desired time limit for attainment of the objective. Although time limits are an essential part of any meaningful objective, the time parameters can be developed by both scientists and system managers (who can identify realistic physical and biological limits to implementation) and policy experts (who can identify policy and economic limits).

struggled at a number of levels with identifying specific and scientifically valid objectives that adequately articulate its conservation goals.

- In developing the Draft Report's example objectives, the Science Advisors clearly identified the assumptions and science underlying their thinking, including where they applied best professional judgment to estimate the magnitude of the problem and what would be required to address the problem. For example, although it is not possible to define and defend an overly precise objective regarding survival through the Delta of emigrating winter-run Chinook salmon (hence "doubling", as opposed to increasing survival by 98% or 104%, for example), the doubling objective is extremely informative and valuable because of the guidance it provides to those designing and reviewing the Conservation Strategy as to the magnitude of the juvenile salmon survival problem and relevant fixes to that problem. The Science Advisors correctly state that "the objectives presented here can and should be refined as the planning process proceeds," but this need for review, refinement, and/or revision did not thwart their attempt to define useful objectives that can form a measuring stick for project aspirations and performance.
- The Draft Report presents an array of useful approaches to identifying baselines that can be incorporated into objectives. With regard to the winter-run Chinook salmon growth objective, the Science Advisors incorporate the known, temperature-specific growth rates of salmon fed their maximum ration and appropriately define the growth objective relative to a potential "stressor" (temperature) that cannot be controlled by BDCP – in this way, the objective acknowledges forces beyond BDCP's control yet incorporates those variables into the analysis. In another example (the adult Delta smelt entrainment objective), the Science Advisors point to values estimated for years when conditions (both levels of a stressor and population status of the species) were better than they are now. In all cases, the Science Advisors correctly define objectives that represent improvements over the status quo, in keeping with BDCP's underlying purpose of contributing towards the recovery of each of the covered species. The flexibility and creativity employed by the Science Advisors in identifying valid baselines for establishing objectives provide a superb model for BDCP as it moves forward with the mission-critical task of developing a full suite of objectives for the covered species and ecosystem attributes (more on this latter point below).
- The Science Advisors have clearly identified the need to identify overall ("global") goals and objectives for the covered species, as these overarching targets (which may in some cases be beyond the scope of BDCP to accomplish) help to define the appropriate magnitude of BDCP's contribution to covered species recovery. The state and federal trustee agencies have developed some preliminary global goals (e.g. the draft NMFS recovery plans for Central Valley

salmonids); they should be strongly encouraged to complete this foundational task so that BDCP objectives can be appropriately scaled and evaluated.

While the Draft Report represents excellent examples of the kind of work that must be done to establish meaningful objectives for the BDCP Conservation Strategy, it can be improved or clarified in several places to provide even better guidance to the subsequent process to develop a full suite of BDCP goals and objectives:

- The Science Advisors should clarify that, though it may be difficult to identify a full suite of quantitative objectives for all the covered species, this should not be interpreted to mean that BDCP's objectives cannot be "specific." Even when available data are not sufficient to quantify an objective, attributes such as time, place, and units of measure can often be described in order to clarify precisely what conditions are relevant to generating "progress" towards a goal. For example, consider a hypothetical objective dealing with increasing habitat for a covered species. Even if the acreage of habitat required cannot be described (even to a rough approximation, which would still be quite useful guidance), an objective can and should still specify attributes such as the location, timing, function, and biophysical structure of the habitat. The more specific the description of the objective, the easier it will be to design conservation measures to support it and to evaluate whether the objective has been achieved. Furthermore, specificity in the description of the objective will support the design of the Conservation Strategy's monitoring and adaptive management programs.
- In those cases where scientific understanding of a species or stressor is inadequate to specify particular attributes of the desired outcome (e.g. magnitudes, timings, locations, etc), that state of affairs should be documented. The lack of scientific information necessary to provide even rudimentary insight into the specifics of a particular objective strongly suggests that the value of the objective is highly uncertain and this uncertainty should be documented as well. In other words, if we do not know enough about a species' vital rates or the magnitude of effect needed to alleviate a hypothesized stressor, it suggests that the value of actions taken to "improve" conditions should be somewhat discounted to reflect the lack of scientific basis for the action.
- We appreciate the Report's focus on species' "vital" (or demographic) rates. Clearly, somatic growth, survival and fecundity rates are the basis of population dynamics and values such as abundance and population growth rates (productivity). However, the Science Advisors should clarify that those aspects of life history diversity (e.g. migration timing or maturation rates) and population structure (e.g. spatial distribution of spawning and migration) that are not captured by simple demographic metrics are nonetheless central to the viability of covered species addressed in BDCP. The Report should underscore the need to

develop objectives for spatial distribution and the promotion of natural life history diversity where appropriate.

- We recognize that the Report was not intended to describe a comprehensive set of objectives for BDCP and that species-specific goals and objectives were the focus of this exercise. This focus was appropriate, as the success of BDCP in contributing to species recovery will be based, in part, on designing a plan that is designed as closely as possible to achieve the type of biological outcomes the Draft Report describes. However, both sound ecological principles and BDCP's legal framework require conservation at the community and ecosystem level as well as the species level. The Science Advisors should clarify that a full suite of specific objectives for ecosystem processes and patterns should be developed, in addition to the necessary species-specific objectives, as part of the next steps to complete the objectives and provide guidance to BDCP construction and performance.

We look forward to working with the Science Advisors to continue to build a firm foundation for the BDCP Conservation Strategy using specific, measurable, and achievable objectives, and appreciate their contribution to the potential success of that effort.