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By fax and by mail

January 6, 1997

Dick Daniel, Assistant Director for Habitat Restoration
CALFED Bay-Delta Program
1416 Ninth Street #1155
Sacramento, Ca. 95814

RE: DRAFT IMPLEMENTATION OBJECTIVES AND TARGETS

Dear Mr. Daniel,

This letter is submitted as the comments of The Bay Institute of San Francisco on the November 15, 1996, Preliminary Working Draft CALFED Bay-Delta Program Ecosystem Restoration Program Plan (ERPP) Implementation Objectives and Targets.

Summary

Our major findings on the draft may be summarized as follows:

(1) The ERPP has succeeded in capturing most if not all key ecosystem elements in its draft implementation objectives and targets, incorporating ecosystem values and concerns at different levels and scales. However, more work needs to be done to integrate the objectives and targets (i.e., create a landscape-level vision).

(2) The ERPP's use of implementation objectives and targets reflects an inadequate conceptual framework and

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should be revised. Implementation objectives should be regarded as measurable performance criteria for achieving the ecosystem quality objectives; targets should be regarded as the best available quantitative estimate of those program components necessary to fully achieve the implementation objectives.

(3) The ERPP fails to quantify most implementation objectives and targets.

(4) Where the ERPP has quantified implementation objectives and targets, many do not appear to be sufficient to achieve the ecosystem quality objectives.

(5) The CALFED schedule does not allow sufficient time for iterative review and finalization of the draft ERPP prior to the initiation of alternative impact analysis.

Implementation objectives and targets: conceptual framework

In order to construct a successful long-term restoration strategy, the Ecosystem Restoration Program Plan (ERPP) needs to provide answers to three basic questions:

1. What are the desired conditions of ecological health? Answering this question necessitates formulating an integrative vision of ecological health for the Bay-Delta estuary.
2. How will we know when ecological health has been achieved? Answering this question necessitates formulating a set of measurable performance criteria (i.e., implementation objectives) for evaluating program success in achieving the desired conditions.
3. What means are necessary to achieve ecological health? Answering this question necessitates formulating a set of quantitative program components (i.e., targets) which represent the best available estimate of the degree of activity needed to fully achieve the desired conditions and which are subject to refinement through the adaptive management process.

Unfortunately, the Program confuses ends and means in its confusing and indiscriminate use of implementation objectives and targets. Most implementation objectives appear in fact to be narrative, non-measurable descriptions of desired conditions (akin to the ecosystem quality objectives); most targets are unquantified descriptors or where quantified function more as

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performance criteria. The latter is particularly inappropriate, since targets are intended to be subject to change through the adaptive management process. The Program must not treat narrative descriptions, performance criteria and implementation estimates as interchangeable.

Integrative vision:

The ERPP needs to describe in detail how the estuary would function under the desired conditions of ecological health by formulating a single, integrative narrative vision that tracks the interactions and performance levels of key ecological indicators (i.e., processes, functions, habitats, species) at all ecosystem hierarchical levels and across all geographical zones. Process interactions, habitat connectivity, etc., should also be addressed in detail for each conservation zone.

Implementation objectives:

An implementation objective should be considered a measurable performance criterion which quantitatively defines the desired condition of ecological health expressed in the narrative language ecosystem quality objectives and integrative vision. To the maximum extent possible, implementation objectives should be expressed as performance criteria for key ecological indicators following the conceptual framework of the joint Bay Institute-Environmental Defense Fund-Center for Sustainable Resource Development report on "Restoration of the San Francisco Bay-Delta-River System: Choosing Indicators of Ecological Integrity" (1996), and progress toward achieving implementation objectives measured by monitoring performance of these key indicators. Where appropriate specific indicators have not yet been developed, a biological performance criterion (i.e., population abundance levels) or reference condition (i.e., water quality/hydrograph of a historical baseline period) should be used as a default.

For biological resources, implementation objectives should result in long-term restoration rather than simply short-term recovery of ecosystem elements at risk. While implementation objectives must necessarily result in recovery and delisting of estuary-dependent species of concern in the short term, full achievement of implementation objectives should result in a further restoration of ecological health. At a minimum, such restoration of estuary-dependent species should be equivalent to or greater than the threshold conditions (population levels, water quality/hydrograph, etc) characteristic of a without-project (i.e., 1950 - 1967) period, or a comparable criterion. The 1950 - 1967 level of development represents a long-term period beginning in pre-Central Valley Project conditions and ending in pre-State Water Project conditions in which abundance and distribution at population and community levels appeared generally stable and healthy and which supported desirable levels of commercial

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and recreational harvest. Such a criterion is preferable to using a single year or a few years in the mid-to-late 1960s, which is focused only on the end of the long-term baseperiod. For all anadromous fish species, the implementation objectives should meet or exceed the doubling of natural anadromous fish production objective required under state and federal law.

Performance criteria for biological resources must be complemented by performance criteria for key physical (process, function, habitat) indicators. Use of the 1950 - 1967 reference condition or the fish doubling criterion, however, may not be sufficient, and is not intended as the sole performance criterion, for restoration of all such natural process elements. In the case of habitat elements, for instance, reference to predisturbance conditions may be more appropriate (see comments on Table 11, below).

Where appropriate, implementation objectives should reflect the natural hydrological variability of the ecosystem. Like the narrative objectives and vision, the implementation objectives should remain fixed. Because implementation objectives embody and quantify a desired condition of ecological health, they are not subject to refinement or replacement through the ongoing adaptive management process but may only be modified through a much more stringent and rigorous formal technical process.

Targets:

A target should be considered a quantitative program component which results in or contributes to achieving the desired ecological condition as defined by the implementation objective. For each implementation objective, therefore, a target or set of targets should be formulated which quantify the salinity or flow regime, areal extent and distribution of physical habitat, stressor removal strategy element, and/or other program components which are considered necessary to fully achieve the implementation objective. Where appropriate, targets should reflect the natural hydrological variability of the ecosystem. Targets are subject to refinement or replacement through the adaptive management process and may not be summarily removed from implementation without refinement or replacement.

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Specific comments

Pg. 1 – Introduction

The draft should be revised to include "the basis or rationale for targets or groups of targets," in order to facilitate constructive comments on the Program's target-setting efforts and aid in the quantification of targets.

Pg. 5 – Limitations of Preliminary Objectives and Targets

The draft states that the implementation objectives and targets must meet "the two primary criteria stated by CALFED: 1) that objectives be acceptable to all stakeholders...and 2) that targets need to be reasonable and practical..."

These criteria are not consistent with a rational, technically based planning process. First, the acceptability of objectives should be most strongly based on the mission of the Program to restore ecological health and on the various requirements contained in state and federal law for full protection of fish and wildlife, water quality, and other beneficial uses of the Bay-Delta estuary's waters, using the best available scientific understanding of ecosystem dynamics. Second, in the absence of well-defined screening criteria for reasonableness and practicality, how are targets to be judged reasonable and practical? It seems more appropriate to consider reasonableness and practicality criteria when considering the feasibility of actions to achieve targets and considering alternative actions to achieve these targets. Furthermore, targets that are judged to be achievable only through unreasonable or impractical actions (using a well-defined set of screening criteria) will undoubtedly be revised through the adaptive management process.

Table 1 – Ecosystem Quality Objectives

The ecosystem quality objectives as currently written do not accurately reflect the mission of the Program "to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay Delta." In order to be consistent with the mission statement, the objectives should generally replace "improve and increase" with "restore...to a level as comparable as possible to the historic natural habitat in integrity, self-sustainability, and resilience to stress" ; e.g., Objective A would read:

Restore aquatic habitats in order to support the sustainable production and survival of native and other desirable estuarine and anadromous organisms

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dependent on the estuary at a level as comparable as possible to the historic natural habitat in integrity, self-sustainability, and resilience to stress.

Table 8 -- Primary Physical Processes

Hydrograph

The words "consistent with a without-project (1950 - 1967) level of development" (or a comparable criterion) should be added to the Implementation Objectives. This performance criterion should be used in numerous implementation objectives throughout the draft.

Implementation Objective A, Targets 1-2:

Managing for multiple seasonal peak flows rather than one fall/one winter-spring pulse will be necessary to achieve the desired benefits of simulating the natural hydrograph, including the importance of flood hydrology and floodplain inundation frequency for sustaining natural processes. More extensive flood frequency targets should be included.

Other quantitative targets for pulse flows should include a) Central Valley Project Improvement Act Anadromous Fish Restoration Plan (AFRP) recommended pulse flows for anadromous fish attraction and transport, and b) April peak flows (i.e., > or = 100,000 cfs) to support stratification in the South Bay.

Implementation Objective B

Quantitative targets to achieve B should include a) AFRP base flow objectives; b) February - June X2 requirements for Suisun Bay at a 1950 - 1967 level of development; and c) appropriate salinity/outflow requirements for San Pablo Bay to simulate the natural hydrograph similar in design to the Suisun Bay X2 requirements.

An additional target should be added to B: "Preserve and maintain existing baseflows in critical periods of all year types."

Implementation Objective C should be added: "Restore features of natural hydrograph to support newly restored habitats consistent with... etc." Targets should include flow regimes to ensure desired inundation of meander zone/floodplain wetlands, inflow to freshwater tidal wetlands, etc.

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Hydraulic regime

Removing barriers to river - floodplain interactions should also be included.

Geomorphology

Implementation Objective A, Target 1: Considering the acknowledged need to restore and enhance hydrologic and sediment regimes (reflected in other objectives and targets in this draft), the restriction of natural stream channel restoration to available hydrologic and sediment regimes is unwarranted.

Similarly, the reference here and in Implementation Objective B, Target 1, to existing flood control constraints overlooks the opportunities for improved flood management through reconfiguration of stream channels, expansion of floodplain wetlands, etc.

Implementation Objective C (Channel islands): Artificially maintaining channel islands should only occur on a short-term basis until natural process and stressor removal targets are achieved.

Implementation Objective D (Tidal sloughs): In addition to restoring existing backwater sloughs, large-scale restoration of freshwater tidal marshes in the Delta will create extensive new natural tidal sloughs and channels. The natural slough system appears to have been much more extensive than now.

Tides

The desired endpoint of Implementation Objective A is not to increase the tidal prism per se but to expand the areal extent of shallow shoal and wetland habitats influenced by the tidal prism. Therefore, Implementation Objective A should be replaced in Table 11 with objectives and targets in the tidal perennial aquatic category and in a new category ("Low-salinity shallow-water habitat").

Table 9 – Secondary Ecosystem Processes

Estuarine mixing is described as a secondary ecosystem process and function element in Table 4 but no objectives and/or targets are included in Table 9.

Stream meander

Targets for restoration of stream meander processes on the lower reaches of Mokelumne and Cosumnes Rivers should be included.

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Nutrient inputs and availability, Aquatic primary production, Aquatic secondary production

The Implementation Objectives should be revised to read: "restore...consistent with a without-project (1950 - 1967) level of development" (or a comparable criterion).

Table 10 – Stressors

Land use

Implementation objectives and targets to control urban development should also be included under "land use."

Exotic species

The implementation objectives should be revised as follows to classify objectives and targets more appropriately and to reflect the priority of preventative management of exotic species:

A. Improve ability of Bay-Delta ecosystem to reduce impacts of new species introductions in order to maintain desired levels of food web productivity (i.e., without project or 1950 - 1967 level of development) and/or desired community composition (see Table 12 comments, below).

(Targets for key process, function and habitat components that increase system resilience should be placed here).

B. Reduce rates of new species introductions.

(Targets for control of ballast water exchanges, etc, should be placed here).

C. Reduce adverse impacts of undesirable introduced species currently in the estuary.

(Targets for exotic species management should be placed here).

Dams, reservoirs and other man-made structures

The following targets should be added to help achieve implementation objective A for dams and reservoirs:

2. Remove obsolete dams and/or other instream barriers that prevent or hinder fish passage where feasible.

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3. Provide adequate fish passage facilities at all instream structures that do not presently allow such passage.

Water management and diversions

Targets for Implementation Objective A (reduce entrainment) should include quantitative targets for screening, consolidating or eliminating diversions.

Targets for Implementation Objective D should include fish doubling flows identified in the AFRP (Targets 1 and 2) and maintenance of X2 at a without project (1950 - 1967) level of development (Target 2).

Contaminants

The Implementation Objectives should be revised to read:

A. Eliminate lethal and sub-lethal effects of pollutants on aquatic organisms.

(Targets for quantitative reduction in discharge of pesticides and other pollutants through source control programs should be placed here).

B. Reduce occurrence of pollutants with bioaccumulative properties in water, sediments and biota to natural background levels.

(Targets for quantitative reductions in loading to estuary's waters of pollutants with bioaccumulative properties should be placed here).

Table 11 -- Habitats

The implementation objective for all habitat restoration elements should read: "Increase the area of [habitat type] to no less than 33 percent (one-third) of predisturbance level." (A 33 percent restoration goal would bring areal extent of Delta and Suisun Bay aquatic habitats into parity with current habitat extent and planned habitat expansion in San Pablo Bay).

All habitat targets should include criteria on areal extent, geographical distribution, minimum patch size and connectivity.

It is our understanding that for a number of key aquatic habitats, targets are based on calculations of the energetic requirements of waterfowl species. While waterfowl requirements are an important factor in assessing the adequacy of aquatic habitats, life-history requirements for spawning, rearing, foraging and

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cover of aquatic organisms must be a primary consideration in setting aquatic habitat targets.

A new habitat category. "Low-salinity shallow-water habitat." should be added. The Implementation Objective should read "Increase areal extent of low salinity shallow water habitat consistent with a without-project (1950 - 1967) level of development." Targets should include appropriate X2 requirements and expansion of tidal wetland acreage in the Delta and upper Bay.

Tidal perennial aquatic, Saline emergent wetland, Fresh emergent wetland

The predisturbance Delta included approximately 345,000 acres of freshwater tidal wetlands, of which about 8,000 acres remain. The predisturbance Suisun Bay included approximately 71,000 acres of brackish tidal wetlands, of which about 10,000 acres remain. The predisturbance San Pablo Bay included approximately 60,000 acres of saline and brackish tidal wetlands, of which about 18,000 acres remain. The combined 13,000 - 15,000-acre target proposed in the draft therefore not only represents a minuscule fraction of the original habitat but represents less than 50 percent of the remnant habitat. There appears to be no credible basis for believing that a relatively small increase in the extent of habitats that are almost extirpated from the estuary will result in attainment of the Program's ecosystem quality objectives. Given that the most extensive remnant area of tidal marsh currently exists in San Pablo Bay, it appears that at a minimum, the Delta and Suisun Bay tidal wetland habitat components should be equivalent to the same level of function (areal extent) as the existing San Pablo Bay tidal wetland habitat component (almost one-third of predisturbance acreage). Tidal wetland objectives and targets for Suisun and San Pablo Bays in the draft should also be consistent with the San Francisco Regional Wetlands Goals Project.

Shaded riverine aquatic

Quantitative targets for SRA and for riparian woodland should be consistent with the objective of a 1,000 percent increase contained in the Comprehensive Conservation and Management Plan for the San Francisco Estuary, signed by the state and federal governments.

Riparian scrub, woodland, forest

The predisturbance Sacramento and San Joaquin Valley watersheds included approximately 922,000 acres of floodplain seasonal wetlands and riparian woodlands, of which about 102,000 acres remain. This figure does not take into account the 200,000 - 300,000 acres of floodplain wetlands and riparian

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woodlands that existed in the Delta itself, which have been reduced to a remnant 26,300 acres. The 8,000-acre target proposed in the draft therefore not only represents a minuscule fraction of the original habitat but a minuscule fraction of the remnant habitat. There appears to be no credible basis for believing that such a minor increase in habitat extent will result in attainment of the Program's ecosystem quality objectives.

Table 12 – Species and Species Groups

Fishes

Attainment of recovery status should represent only a first increment in the full attainment of fish species implementation objectives. Furthermore, most of the fish species targets should be reclassified as part of the implementation objectives. For all fish species, Table 12 should be revised as follows:

Implementation objectives: For all fish species of concern, short-term implementation objectives (5 - 10 years) should consist of attainment of populations that represent recovery, as defined in recovery plans, for each geographic unit. For all fish species, long-term implementation objectives (5 - 25 years) should consist of attainment of a "without-project" (1950 - 1967) level of natural production (or a comparable criterion) that supports long-term sustainable levels of food web productivity and/or commercial and recreational harvest. For all anadromous fish species, these objectives should meet or exceed the doubling of natural anadromous fish production objective required under state and federal law.

Targets: For each fish species, targets should include the desired quantitative improvement in salinity regimes, transport flows, areal extent of key habitat types, reduction of stressors, etc.

Fish Species Groups

The Program should consider including desired improvements in community composition, such as native species diversity (i.e., percentage of total species numbers or biomass that consists of native and other desirable species) and/or relative native species abundance (percentage of total species numbers or biomass in representative groups or at selected trophic levels that consists of native and other desirable species) as implementation objectives and/or targets, as appropriate.

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Estuarine Food Web Organisms

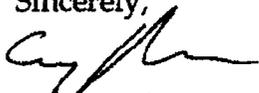
The targets should be incorporated into the implementation objectives, which should be revised to read "...in order to support food web productivity at levels consistent with a "without-project" (1950 - 1967) level of development" (or a comparable criterion). Targets should be added (key process, function and habitat elements contributing to attainment of the objectives) as appropriate.

*

More detailed technical recommendations on implementation objectives and targets for a number of key ecosystem elements are being prepared by a joint Bay Institute - Environmental Defense Fund team for consideration later this year. We look forward to working with you on the quantification of implementation objectives and targets. This step is a necessary prerequisite to the initiation of Phase II impact analysis and the subsequent evaluation of the ability of the various CALFED alternatives to be consistent with and to help achieve the ecosystem quality objectives. Until a set of measurable implementation objectives and quantitative targets has been arrived at, it is clear that the Bay-Delta Program will be unable to proceed with Phase II impact analysis.

Thank you for your consideration of our views. Please contact me at (415) 721-7680 if you have any questions regarding these comments.

Sincerely,



Gary Bobker
Senior Policy Analyst