

Memorandum

Mr. Dick Daniel
Assistant Director
CALFED Bay-Delta Program

Date : January 2, 1997

From : Department of Fish and Game

Subject : Comments on November 15, 1996 Ecosystem Restoration Program Plan Implementation Objectives and Targets Report

The Department of Fish and Game has reviewed the subject report and has the following comments and input. Our comments take the form of general comments that address broader issues or apply to larger sections of the report and specific comments on the text annotated by page.

GENERAL COMMENTS

Program Scope and Ecosystem Quality Objectives

Reviewers within DFG experienced great difficulty understanding the scope of the Ecosystem Restoration Program. The general tendency is to think of the ecosystem as including the whole Central Valley, and to not understand the concepts involved in the Problem and Solution areas. The report needs to be improved in three areas to provide a satisfactory explanation of the program's scope. One is the description of the planning area on page 6 needs to be improved by describing better the concepts underlying the Problem and Solution areas as they apply to ecosystem restoration. It needs to be very explicit that the program is not an ecosystem restoration program for the solution area.

This section also needs to either define the concept of the focus study area better or eliminate it. The focus study area is shown on Figure 2 but described in the paragraph describing Figure 3, and the description is downplayed by not using capital letters even though it is capitalized at other locations in the text. The possibility of eliminating the category should be considered as it may not be worth the additional layer of complication. It is hard enough getting across the concept that an ecosystem restoration program focused on the Delta and Suisun Bay is going to include some actions in a larger solution area, but not all actions in a larger solution area, but not all actions needed for ecosystem restoration in the solution area and not actions beyond the solution area despite ecological links that exist, without adding the

concept of the focus study area. It is our understanding that the criteria for whether an action should be included in the program is the same whether the action is in the focus study area or the remainder of the solution area. The distinction is merely that actions in the focus study area are more likely to satisfy the criteria than actions in the remainder of the solution area. The distinction is merely that actions in the focus study area are more likely to satisfy the criteria than actions in the remainder of the solution area.

The second place where changes are needed to increase understanding of ecosystem restoration as used in this program is in the Ecosystem Quality Objectives. These objectives were drafted by-in-large as if all actions are to occur in the Bay-Delta or the estuary. This overlooks both the fact that much of what is commonly considered the Bay-Delta or the estuary is not included in the Problem Area, and the fact that as the program has evolved many actions are expected in the Solution Area, particularly upstream of the Delta. We recognize that this problem arose because the objectives were drafted in a public process early in the program before the concept of the Problem and Solution areas was fleshed out, but it is now time to make appropriate changes.

Some of the actions anticipated in the Solution Area are in categories described satisfactorily by the present objectives except for the geographic characterization for the present objectives. For example, Ecosystem Quality Objective A describes some actions which could occur upstream of the Delta if the objective were not limited by the words "in the estuary". There are 15 or more instances in Table 1, Ecosystem Quality Objectives, where the objective could be interpreted as specific to the Delta or estuary.

There have been discussions of correcting the problem by specifying that actions could occur "in the Delta and other locations" and/or referring to resources "in or dependent on the estuary". Our specific comments include some suggestions of that type. Upon further reflection of the difficulty of getting understanding of the Problem Area and Solution Area concept, as described above, we suggest considering the following alternative: refer taking actions either in the Problem Area or Solution Area for resources in or dependent on the Problem Area.

The third area of improved scope concerns the breadth of the Ecosystem Quality Objectives. We recommend that an ecosystem quality objective for chinook salmon and steelhead spawning habitats be included. We suggest inserting the following sub-objective under the objective for improving and increasing aquatic habitats:

Objective A.1.c. (new) Increase amount of quality spawning gravel to sustain increased populations of chinook salmon and steelhead.

Although we found an objective that included entrainment of lower trophic organisms, we could not find an objective that addressed the entrainment of juvenile fish at water diversions. Therefore, we recommend the following sub-sub-objective be inserted under

Objective A.6 "Reestablish appropriate upstream and downstream movement of anadromous and estuarine fish":

Objective A.6.d. (new) "Reduce losses to entrainment of juvenile anadromous estuarine, and resident fish species at diversions".

Likewise, we recommend a new objective that addresses the stranding of juvenile fish:

Objective A.6.e. (New) "Reduce losses of juvenile anadromous fish due to stranding".

Other suggested revisions are described in our specific comments below. The following are recommended additions:

- Improve the primary physical processes associated with the mainstem rivers and major tributaries.
- Improve river spawning habitat for salmonids
- Increase amount of high-quality salmonid holding and rearing habitats

Riparian Objectives: Riparian and shaded riverine aquatic habitats are identified in the following objectives and sub-objectives: A-2, A-2-a, A-2-b, A-2-c, B-3, B-3-a, B-3-b, B-3-c, B-3-d, B-7. Condensing the objectives for riparian protection and restoration would reduce redundancy.

Finally a new objective concerning exotic species is needed as follows:

Objective A.7.h. (new) Eliminate the influx of exotic species shipped into the State via the legal entry of commercial and recreational species (e.g. lobsters and baits fish).

Fish and Wildlife Management Targets

Another general area of concern to the Department is the way two primary fish and wildlife management functions are characterized in the report. These are "Harvest of Fish and Wildlife" and "Artificial Production of Fish". Both are mentioned only as stressors and thus are characterized in a negative way. One primary purpose of the Ecosystem Restoration Program should be to restore large populations of fish and wildlife, so the benefits of harvest can be realized by society. While artificial propagation is not really an ecosystem restoration function, the reality is that it is an important management action which is going to continue for some fish due to how we have changed the system. One of the challenges certainly is to do both in a way that deals responsibly with the issues raised in the present stressors description. We recommend adding a separate section on Fish and Wildlife Management in Table 2 which

would include sections on harvest and artificial production. Our specific comments provide some suggestions for those topics, but further work is also needed to flesh them out.

Implementation Objectives and Targets

Our major general concern stems from the concept that implementation objectives are to be kept constant over time, while targets are expected to be modified through adaptive management. That concept is acceptable only if the implementation objectives are much more specific than they are now. Essentially none of the present implementation objectives are much more specific than they are now. Essentially none of the present implementation objectives are specific enough to provide any meaningful assurance of substantial improvements in the ecosystem. This problem should be fixed either by making the implementation objectives more specific or by including targets in the hierarchy of objectives which will not change. Under that approach, actions would be the component that changes based on adaptive management.

Many of the implementation objectives and targets need significant rewording. For example, the first implementation objective under Hydrograph (p. 41) includes three targets. The first two are very similar and reordering and rewording could help clarify the difference between these targets. The first two also describe two features, an initial pulse flow and late-winter or spring pulse flow, as the only features of a hydrography that will be "emulated". Targets should also be described for other features of a hydrography and other times during the year should be addressed. The third target doesn't seem to make sense since it isn't clear how you can manage storage on tributaries with "little or no storage capacity" to accomplish the stated purpose. ERPP staff should complete the substantial editing that is needed.

We are concerned about the use of the term "sustainable", most often as in "sustainable populations, without some numerical abundance goals. Page 2, Para 2 suggests sustainable populations means "an abundance of resident and anadromous fish sufficient to support viable recreational and commercial fisheries. This definition is dissatisfying because what constitutes viable fisheries is not specified. Somewhere the population goals will have to be written down. Future assurances documents will have to include measurable performance criteria, including some quantitative abundance goals for at least some species.

Another general problem is that while some of the draft targets are quantitative, others are as general as the implementation objectives. We recognize the difficulty of quantifying many of the targets. For example, it may be difficult to include specific ranges of flow as targets in many cases. Alternatively, references to historical conditions, specific seasons, and purposes may be the way to provide sufficient specificity.

The level of development of targets seems to be quite uneven. As examples, a series of specific targets are included for some species such as giant garter snakes and sandhill cranes, but very few targets seem to explicitly relate to salmon. The level of target development should be expanded for salmon and other fish species.

Adaptive management should not be used to substitute for well defined implementation objectives and targets. A strong adaptive management program will flourish only in the presence of those well defined objectives and targets.

The Department recognizes that the need to develop and distribute this draft within a short time frame resulted in an incomplete list of implementation objectives and targets. Some ecosystem elements, such as shorebird and wading bird guild, upland game bird guild, and waterfowl, still need objectives and targets. For others, additional targets are needed.

Part of the problem is this Objectives and Targets document is only part of the picture. More products will be forthcoming. In this regard, the December 18 draft Vision for Chinook Salmon lists the goals of various agencies, indicates CALFED embraces each of the restoration goals and will seek to maintain cohort replacement rates much greater than 1.0 while individual stocks are rebuilding to desired levels and maintaining replacement rates greater than 1.0 thereafter. While this represents one approach to describing CALFED goals, some of the goals of the respective agencies include salmon harvest plus escapement while others include only escapement, thus their comparability depends on assumptions about harvest rate. Performance measures and success criteria should be defined by CALFED now so there will be no confusion later as to if and when the CALFED Ecosystem Restoration Program has achieved its goals. We advocate that the ERPP use consistent measurements such as escapement to describe targets.

The Department believes that many of the targets need to be presented in terms of ranges rather than specific numbers. Also, targets should be phrased in a way that recognizes that there will be short, intermediate, and long term targets.

Finally, agreement should be reached about whether the Programmatic EIR/EIS is addressing the range of programs for accomplishing certain objectives or just the objectives themselves. The first approach would likely require a level of definition beyond that currently included in the targets and those actions should not be delayed until Phase III. To provide a specific example, one target on page 76 is "to restore (organic carbon) to levels consistent with mid-1960s level of development. It isn't clear how that could be included in the EIR/EIS without some analysis of the range of measures to accomplish it. Part of the problem is that some targets are to be accomplished, at least in part, by implementing other targets, but most such linkages are not identified in the text. For example some stressor or habitat targets may be intended to accomplish the organic carbon restoration target, but that is not indicated.

Riparian Habitat Restoration

Although the ERPP addresses restoration of riparian habitat, the tremendous loss of riparian habitat in the Delta and along its tributaries makes these a special concern. The ERPP leaves the impression that most riparian restoration will occur along existing waterways and

levees in the Delta with some possibility for larger efforts in set-back levee areas of major waterways. The ERPP should identify opportunities for creating/enhancing larger blocks of riparian habitat even if these opportunities do not occur along the water side of Delta waterways.

Target Rationale

The basis or rationale for the targets for sensitive species and habitats should be provided. Rationale can include historic ranges or habitat requirements of habitats or species considered. Explaining the basis for targets would improve their credibility.

Exotic Species

The ERPP addresses water hyacinth and should discuss a wider range of harmful exotic plants, both terrestrial and aquatic. The ERPP should include a list of high priority exotic plant species to be addressed, perhaps using a list developed by the California Exotic Pest Plant Council.

References

The CALFED Bay-Delta Program staff working on the Ecosystem Restoration Program Plan (ERPP) may wish to refer to a recent article in "Fisheries" by Harold L. Schramm Jr. and Wayne A. Hubert (Fisheries: Vol.21, No. 12, pages 6-11) to help in defining ecosystem management and provide guidance to ensure restoration activities will be effective.

SPECIFIC COMMENTS

Please consider the following specific comments:

Page 2, paragraph 2: The second paragraph under Ecosystem Restoration Program states in the last sentence "Where ecosystem function and habitat restoration are inadequate to maintain species and communities, direct artificial support (e.g. hatcheries) might be necessary". We suggest that the following be added at the end of the sentence:

"to compliment ecosystem restoration activities"

Page 5: Three criteria are listed in the first paragraph for inclusion of a species or group of species as an ecosystem element. The three criteria specify that the resource element must either have a

direct link to the Delta (1 and 3) or be economically important (2). The direct link to the Delta is certainly a basic objective, however a qualifier should be included that selection of ecosystem elements, implementation objectives, targets and actions, will not adversely impact any other species or ecosystem outside of the Delta but within the Ecosystem Restoration Program study area and watershed region boundary. Any unavoidable impacts should be offset using the same ecosystem approach advocated in the ERPP. Adverse impacts should not be mitigated at the end using a species by species approach.

Page 10, Figure 3: The focus study area delineated should include wetland and aquatic habitat areas in other portions of San Francisco Bay, specifically central and south Bay. Solutions, from an ecosystem perspective, should include the entire Bay. Ecosystem processes and functions critical to restoring and maintaining the estuary's aquatic resources are important throughout the Bay. Wetlands in the Bay provide nutrient cycling and primary productivity that all contribute to dealing with problems manifest in the Delta.

Page 11: Objective A.1.b: Shoal habitat adjacent to the main channels, rather than within the main channels would be more desirable and achievable (I would define a "main" channel as greater than 30' in depth).

Page 11, Objective 3.b: Water hyacinth is apparently an impediment to adult salmon migration in the Merced River and thus should mentioned in connection with Objective A.6.

Page 12: Objective A.4.b. and A.4.c: A better definition of "low-salinity" and "brackish water" habitat should be described since most estuarine scientists find them to be mutually exclusive.

Page 12, Objective A-5-b: Rephrase this subobjective to improve, rather than increase, the transport of young fish. We may not wish to increase the transport of certain young fish depending on their readiness for entry to brackish water. We do wish to improve the probability that young fish can move downstream when the proper environmental and biological cues are present. This objective is linked to subobjective 6-b. A proposed change could be:

Improve the transport of young fish to rearing areas within the estuary and ocean.

Page 12: Objective A.7.a: Replace the word "productivity" with the word "productions" so that it reads "Reduce entrainment of biological production..." (not productivity, which is a rate).

Page 12, Objective 7.b: This sub-objective related to toxicants should be moved to, or may already be covered by Objective 8.

Page 12, Objective A-7-c: This objective discusses reducing the effects of non-native species. We suggest that the Objective should read:

"Eliminate or reduce the effects of non-native species....".

Page 13: Objective A.7.e: The purpose of this objective is unclear since Scientist generally concur that nutrients do not limit primary production or productivity in the Delta (or elsewhere in the Estuary). What would be the value of increasing nutrients? For this objective, is the goal to increase the amount of nutrients by somehow modifying the existing wetland and riparian habitats or by increasing the amount of these habitats?

Page 13: Objective B: The following words should be added so that the objective reads "... survival of *fish, plant, and* wildlife species."

Page 13: Objective B.1.c: We do not believe that riparian woodlands are a supporting habitat for brackish tidal marsh habitat and their reference should be removed.

Page 13: Objective B.2: Suggested wording change so that it reads: "Increase the amount of high-quality tidal and non-tidal freshwater marsh habitat." Note: this should be the same a fresh emergent wetland - they are switching terms.

Page 13: Objective B.2.c: Suggested wording change so that it reads: "Improve the connectivity between freshwater marsh habitat and their supporting habitats, such as aquatic habitats and riparian woodlands."

Page 13, Objective 7.e: Increasing the nutrient contribution from wetland and riparian habitats to aquatic habitats will be accomplished through conversion and creation of more wetland and riparian habitat. Thus, this objective is linked to other objectives and these linkages need to be described so that the multiple functional benefits of specific habitat restoration becomes apparent.

Page 14: Objective B.3.d: Wording change remove the words "brackish marsh" and replace with "freshwater marsh" so that it reads: "Improve the connectivity between riparian woodlands and freshwater marsh habitats".

Page 15, Objective B.7.: Suggest rewording to read: to increase the abundance and species diversity of fish and wildlife. Sub-objective B.7.b is potentially contradictory to the objective of creating more shallow water habitat.

Page 17, Section A: The Department recommends substituting "Stream Discharge" for hydrograph since hydrograph refers specifically to a data presentation process while stream discharge is a physical process. We also recommend substituting "Morphology of Stream Valleys" or "Fluvial Geomorphology" for Geomorphology because these terms refer to watershed and ecosystem processes while geomorphology refers to all types geological processes.

Section B: We recommend adding stream length, stream depth, stream velocity, stream substrate quality and eliminating current velocity. The basis for selecting the recommended additions is the

same basis for focusing on them in the Instream Flow Methodology used to analyze streamflow alteration.

Page 17, D. Habitats: The habitat list presented in Table 2 should also include habitat types more relevant to fishery biology in the Central Valley. Habitat classifications for salmon and steelhead include: (1) migration, (2) holding, (3) spawning, (4) incubation and early emergence, (5) rearing/nursery, and (6) emigration. Other types can also be added such as gravel riffles and deep pools, because they are important components of the riverine habitats in the upper valley. Many of these habitats are indirectly addressed in other ERPP ecosystem elements such as gravel recruitment, gravel transport and cleansing, water temperature, current velocities, and shaded riverine aquatic. From a management and restoration perspective the ERPP should set targets for the critical habitats required to sustain populations of salmon and steelhead.

Section E. Plant Species Association: Consideration should be given to adding the following important natural community types: Great Valley Cottonwood Riparian Forest, Great Valley Mixed Riparian Forest, Great Valley Oak Riparian Forest, Great Valley Willow Scrub, and Elderberry Savanna. In the Plant Section we recommend adding Elderberry.

Page 18, Fish Species Groups 15 and 16: Consideration should be given in the ERPP to applying the "other native resident fishes" and "other non-native resident fishes" other categories such as amphibians and reptiles, birds, and mammals.

Page 18: Plants: It appears that several special status species that occur within the "Problem Scope" as defined in Figure 1 have not been included in the document, examples of such plant species are:

Bogg's Lake hedge-hyssop, *Gratiola heterosepala*,
Slender Orcutt grass, *Orcuttia tenuis*, and
Sacramento Orcutt grass, *Orcuttia viscida*.

These plants occur in seasonal wetland habitats near vernal pools and should be added to the list of plants in Table 2. A list of plant species can be provided to the CALFED process for inclusion in this document.

Page 21, Estuarine mixing: Reference to X2 should occur after the words "position of" and reference to it as a water quality standard deleted.

Page 21, Gravel transport and cleansing: The descriptions of these two processes in the first sentence are reversed.

Page 22, Table 4: Minimum carry-over storage in reservoirs should be added to the Water Temperature Section as a factor affecting water temperature.

Page 25, Table 5: Under the Water Management" section add stranding of all life stages of fish during rapid changes in release and stranding of immobile life stages (i.e. eggs) during longer term reductions in stream discharges.

Page 27, Aquatic seasonal: The ERPP does a good job of addressing wording on restoring the bottom of the food web where the most benefits should accrue. However, there is little emphasis on the bottom of the terrestrial food web. Examples would be increasing midge larvae in flooded fields and brood ponds. The basis for selection should be expanded to include support of terrestrial invertebrates.

Page 29, Valley oak woodland habitat: The basis for selection of the Valley oak woodland habitat ecosystem element seems to focus primarily upon the value for wildlife. The intrinsic value of Valley oak woodland and its importance in supporting important secondary processes and functions should also be included. The basis should also mention that Valley oak woodlands may be the most threatened of the various riparian communities in the Central Valley.

Page 31, Sacramento spring-run chinook salmon: The Sacramento spring-run chinook salmon is identified as a "closely monitored species". The official designation adopted by the Fish and Game Commission (not the Department) is "Monitored Species".

Page 32: Non-native resident fishes group: The following fish should be reassigned to the appropriate categories:

Yellowfin goby is an estuarine species, which is partially catadromous.

Chameleon goby is an introduced marine species.

Page 32: Marine fishes group: Additions and changes -

The following species should be added to the Marine fishes group due to their commercial and sport fisheries or are ecologically important:

Crangon nigricauda,

Dungeness crab,

leopard shark,

white croaker,

shiner perch, and

English sole.

The Fish Species Group should consider creating a category that encompasses estuarine species of commercial and recreational importance:

Crangon franciscorum,

yellowfin goby, and

starry flounder,

The Starry flounder is a species that would and should be moved to the an estuarine species.

Prickly sculpin should be moved to the freshwater species group of "Native resident fishes".

Page 41. Table 8: The Department recommends substituting the Implantation Objective for "Hydrograph (Stream discharge)" with the following: "Make every effort to provide those basic feature of the stream discharge that are responsible for maintaining the ecological process and function in the river and its estuary, for important fish species". The original objective A references "natural seasonal flow patterns" which is precisely what the dams are directed at permanently altering.

We recommend eliminating item B entirely because its contrary to the following practices: 1) The existing agreement for flow on Mill and Deer creeks reduces baseflow below pre-project levels to save water for the spring period, and 2) The agreement for the salmon maintenance program" in the Sacramento River requires that the base flow period have much greater stream discharge than the pre-project period to provide the water temperature necessary to maintain salmon that can no longer ascend to their historical cold water habitat above Shasta dam. Specifically this MOU states "That in operating Shasta Dam, the Bureau shall make every effort to maintain flows and temperatures in the Sacramento River which are necessary for fishery maintenance ...)

Page 41: The word "semblance" is used several times and could be replaced with a better word. Consider using:

"Emulate the hydrograph or hydraulic regime to the degree possible".

Page 42: Because the Cosumnes River flood plain is unique, it may not be realistic to use the Cosumnes River flood plain as a "model" for other tributaries which have very different drainage basins with cities along their courses.

Page 42: There may be too much emphasis on channel islands, considering the relatively small size of most and the major extent of proposed wetland restoration. It may not be possible to restore or maintain these existing habitats without aggressive structural efforts that in turn adversely degrade their value. Hopefully, the program will restore enough wetland that extraordinary efforts to protect small channel islands will no longer be justified.

Page 42: Removing barriers to tidal flow would help move the Delta back towards what it was, but this raises concerns about potential severe local problems which may result. The magnitude of benefit is also questionable. It isn't clear what the specific local problems might be, but as an example, Trapper Slough seems so modified that one has to wonder what the consequences of opening it up again would be. As to the benefits, considering the many miles of sloughs which exist now, it seems hard to believe that more of the same would be all that significant. The issue seems to be more one of improving the character of existing habitat by providing more SRA etc.

Page 43: We want to restore tidal wetlands for the various benefits that wetlands provide, but increasing tidal volume is not one of the benefits which should be sought. More tidal volume can

translate to more salinity intrusion, which we probably do not want. We are not aware of any hypothesis as to benefits directly attributable to increasing the tidal prism, and even if there is such an hypothesis, restoring wetlands may not affect the tidal prism enough to have a significant benefit.

Page 43: You do not restore net downstream flow by changing the tides. Net downstream flow is a function of the magnitude of freshwater flowing towards the ocean.

Page 43: The meaning of "restore the natural tidal and estuarine mixing regimes in major portions of Suisun Marsh..." needs to be clarified. It should be clarified that it isn't a reference to remove the Suisun Marsh Salinity Control Structure. These last three comments lead us to recommend deleting the whole section on tides.

Page 43. B.2: The word "Montgomery" should be replaced with the word "Montezuma"

Page 43: It is not clear, but fire probably pertains only to watershed management above the primary solution area. We believe it is the only implementation objective related to watershed management. Clearly watershed management involves much more than fire. Having the fire section here creates the possibility of interpreting it as relating to management in the primary solution area. We recommend moving it to a separate section on watershed management.

Page 45, Table 9: The Department recommends replacing the Implementation Objective for water temperature with: Attain the water temperature objectives adopted in the Basin Plan for the Central Valley Regional Water Quality Control Board for protecting the cold water fish production uses designated in the plan. Those rivers lacking specific temperature objectives to protect cold water fish production should have specific objectives established through the amendment process. The basin plan objectives are more relevant than natural water temperature regimes. Providing a cold water environment below the large dams is essential for anadromous fish production because access to the cooler stream reaches has been permanently eliminated by dam construction. The reservoirs behind the dams do have the same capability to compensate for the lost access to cold water habitat by creating new cold water habitat below the dam where it did not naturally occur. This compensation of cold water habitat below the dams is consistent with several laws, agreements, and mitigation policies as well as the Basin Plan.

Page 45, Gravel recruitment: We recommend that target A be modified to read:

"Maintain or restore the important gravel recruitment processes to riverine systems of the Sacramento-Can Joaquin basin."

Enhancement does not seem to be an appropriate target.

Page 46, Table 9: We recommend replacing the Implementation Objective for "Current (Stream) Velocity" with: "Make every effort to provide stream velocities over sufficient length and width of the stream channel to maintain ecological processes and functions in the river and its estuary for important species.

Page 46: This is similar to an earlier comment that nutrients are not a limiting factor to production, in addition reliable data nutrient data for the 1960s is not available.

Page 47: Aquatic primary production. Same as page 46 comment.

Page 47: Aquatic secondary primary production. Same as page 46 comment

Page 50: Wildfire- see comment 6. We do not see a definition of "ERPP focus area". If it is the primary solution area doesn't it exclude the upper watershed? In any event, is this section proposing fire control measures on the valley floor, and is it appropriate?

Page 50, Table 10, Wildfire Stressor: We recommend replacing Implementation Objective A with the following: Reduce the potential for the types of wildfires found to be damaging to important fish and wildlife resource within the ERPP Study Area (Figure 3)." In addition we believe Implementation Objectives B and C should be combined with A and the targets be renumbered from 1 through 4.

Page 51: Several exotic species measures propose reducing populations by 10%. We are skeptical of our ability to reduce selectively populations by 10% in most cases, and even if we did, we doubt that the stated benefits would occur. I. e. reducing populations by 10% are unlikely to have measurable effects on other populations. Instead it may be more prudent to select specific measures that would reduce exotic species introductions. One effort might be to educate teachers who purchase bullfrog tadpoles for their students to rear and release in red-legged frog habitat.

Page 51: The discussion of exotic plant species should be expanded and clarified, so that it includes other undesirable exotic plants that occur in the Delta.

Page 51, Exotic Species B. 1., 2: The ERPP identifies bullfrogs as a constraint to California red legged occupation of the Delta. The ERPP should clarify whether the Delta was "historic habitat" and should where suitable habitat could be developed where red-legged frogs would not be vulnerable to continues predation by bullfrogs or other predatory species such as striped bass, largemouth bass, and sunfish.

Page 52: Regarding water diversions, delete nutrients from the target. There is no way to selectively reduce the diversion of nutrients, and to whatever extent more nutrients are needed, the intended benefit should be addressed directly by flow maintenance provisions or measures to increase nutrient concentrations.

Page 52: Regarding water diversions, where did the 50% reduction goal come from and why single out striped bass for the target related to mid-1960s level? Why not have only a single target tied to either 50% or mid-1960s level? Incidentally, this is a good target to illustrate how essential it is to define actions to some degree during Phase II. This target might be accomplished either by installing better fish screens or by curtailing diversions with enormously different consequences. Plainly, no chance exists to get acceptance of the target absent more information about how it will be accomplished.

Page 52, Dam reservoirs, and other manmade structures: If it can be established as feasible, the ERPP should consider targets related to providing fish passage to historic spawning, holding, and rearing habitat above hydroelectric dams and water storage projects.

Page 52, Water management and diversions, Targets A. 1: The sentence reads in part "... into diversions by 50% in Bay, Delta, rivers, and tributaries". The basis for selecting 50% should be provided. The 50% goal is not consistent with the protective measures being required by the National Marine Fisheries Service for winter-run chinook salmon, and the U.S. Fish and Wildlife Service for delta smelt. The ERPP should explain the reasons for the inconsistency.

The existing target statement needs to be more explicit, for example, the current language would suggest that screening half the diversions at 100% efficiency is as acceptable as screening all of the diversions at 50% efficiency.

Targets A-1 and A-2: The ERPP needs to clarify the difference intended between the language in target 1 "reduce entrainment" and the language in target 2 "reduce export loss".

Page 53, Table 10: We recommend substituting Water Management Implementation Objective D with the following: "Make every effort to operate water project facilities to maintain stream velocity, depth, area, and temperature conditions that support ecological processes and functions in the rivers and the estuary for important species.

Page 53, Table 10, Gravel Mining: Add aquatic habitat to the objectives gravel recruitment effects with the following edit: A. Reduce the effects of gravel mining on gravel recruitment and aquatic habitat in mainstream rivers and tributaries.

Page 53: The second target under managing flows is too narrow. Delta outflow is needed for species other than those of special concern.

Page 54: It just doesn't seem reasonable to have one target concerning all contaminants. This section should be expanded even though the Water Quality Program is involved with this issue as well.

Page 55: Reducing legal harvest is not an appropriate implementation objective. In some cases it is an appropriate action to help accomplish some species population target. The appropriate

implementation objective would be something related to maintaining substantial sport and commercial harvests of sport and commercial fish and wildlife species.

Page 55, Predation and competition, B. 1: The Implementation objective is clear, but the target should be modified to delete the word "native". This will allow for the target to apply to an important upland game species the ring-necked pheasant.

Page 56, Table 10, Artificial Production stressor: We recommend the following wording as a substitute for the current language:

A. Establish production goals and constraints on anadromous salmonid hatcheries to attain fair compensation for the estimated net production losses between the pre-project and post-project river systems.

B. Any supportive breeding program for species of special concern or status will be carefully controlled to ensure genetic integrity of the stock and that the contribution for artificial propagation does not reduce the effective population size of the wild population.

Page 56: The implementation objective and targets for artificial production should be rewritten to be positive ones defining the proper role of artificial propagation.

Page 57: The objectives and targets appears to list the creation of additional habitats as a higher priority than the protection of existing habitats. Often with plant communities it is more cost effective to protect existing unprotected habitats than to create habitat where none exists. A reordering of the targets to put habitat protection above habitat creation is warranted. A more practical approach to this process of habitat restoration might be to delineate the existing habitat types and develop targets and goals based on that effort.

Page 57: Why single out only striped bass for provisions of minimum flow? Other species need to be included.

Page 57: The additional miles of dead end slough need a better description. While the rationale sections may provide that, another way is to modify the section which provides for new wetlands to make it clear that what is envisioned is a mosaic of wetlands and the natural channels within them. That would avoid describing components of the whole in different places which both tends to obscure what is intended and gives the impression that there are more targets or actions than there really are.

Page 57, Objectives C and D: These implementation objectives should be relocated under tidal perennial aquatic habitat.

Page 61, Fresh Emergent Wetland: This Implementation Objective represents one of the best practical restoration measures for fish and wildlife in the Delta. By increasing the surface area of

undiked tidal wetlands in the eastern Delta at the end of dead-end sloughs, you could significantly increase the habitat available for waterfowl, sandhill cranes, black rail, giant garter snakes, and Swainson's hawk, California rose mallow, Delta tule pea and Mason's lilaeopsis. Habitat restoration activities for these species at or near the 0 foot elevation (sea level) eastern periphery of the Delta would result in nearly continuous habitat with little or no vulnerability from levee failure. Habitat restoration for species like the GGS and Swainson's hawk in the deeper Delta islands may not be as valuable due to isolation and vulnerability from levee failure. In addition to increasing habitat acreage and value, dead end slough tidal wetlands would increase tidal action to the Delta and provide a habitat buffer around the eastern extent of the Delta that would serve to limit residential and commercial encroachment.

Increasing tidal wetland marsh in this manner would eliminate many concerns connected with channel island restoration/protection efforts. Tidal marshlands located at the head of sloughs would not be subject to the erosive effects of boat wakes and channel velocities, and they would represent a real increase in tidal wetlands, whereas, channel island restoration is at best a holding action. Some former tidal wetlands (White Slough and Hog Slough) were functional wetlands as recently as the 1950s and could be easily restored from their present "reclaimed" condition.

Page 61: Are the first and second targets under freshwater emergent wetlands intended to be additive? The distinction isn't clear.

Page 62: The distinction between the first two targets under riparian habitat and SRA needs to be clarified.

Page 63, Riparian scrub, woodland, and forest, A.4: The restoration goal for the Sacramento River is stated as 5,000 acres. The Upper Sacramento River Riparian Restoration Plan (SB 1086) has defined acreages which should probably be included here. There are various other references to acreage goals which should be in agreement with the SB 1086 plan.

Page 63, Channel Islands: The target selected for channel islands is unrealistic and unnecessary. A more reasonable target would be to protect and restore the highest value remnant channel islands in areas important as fish and wildlife habitat and for supporting important ecosystem processes and functions.

The target for this Implementation Objective should describe salient features of channel island restoration, such as patch size, vegetation composition, and distribution. Isolated and/or small channel islands may have limited habitat value for species like California black rail.

The Implementation Objective for vernal pools and perennial grasslands should list protection of manageable tracts of habitat as an objective that precedes creation or restoration. Protection of vernal pools and native grasslands should include the range of subtypes within each of these habitats such as northern claypan vernal pools and foothill needlegrass grassland.

Page 64, Agricultural wetland habitat, Targets: The sentence reads in part "Improve management on 100,000 acres of rice field acreage in the historic Sacramento River floodplain to increase the wildlife forage and resting area habitat values of rice fields . . .". It should be recognized that this should be accomplished to agree with the goals of the North American Waterfowl Plan and the Central Valley Habitat Joint Venture. The target should be worded to state that this management will be done in a manner that improves conditions for aquatic resources and, at a minimum, avoids adverse impacts to other fish and wildlife potentially associated with winter flooding rice fields.

Page 67: Specifying cohort replacement rates of greater than or equal to one is fundamentally flawed because it could result in a conclusion that maintenance of present stocks is satisfactory. It isn't clear why the ERPP fails to specify numerical abundances for salmonids while doing so for many other species. This is particularly true because other programs and even law are specifying numerical objectives.

Page 67, Table 12, Population Targets: The Department is concerned about whether there is a sound method for establishing targets for minimum populations for winter-run chinook salmon and spring-run chinook salmon. We recommend that targets which present minimum population sizes be developed after the technical merits for selecting those targets is evaluated. In any case targets still need to be set for desired population levels for the various runs of chinook salmon and steelhead.

The recommended targets for all the anadromous salmonids should state that while the range and habitat quality is being restored maintain a cohort replacement rate greater than 1.0 then after restoration, maintain a long-term average cohort replacement rate of at least 1.0.

Furthermore, targets should be expanded to include restoration of populations that can support the local fishery and help support coastal commercial and sport fisheries.

Page 67, Sacramento winter-run chinook salmon: The ERPP population targets need to take into account targets in the draft recovery plan for this stock. For example, the Sacramento River Winter-run Chinook Salmon Recovery Team has recommended to the National Marine Fisheries Service the following recovery goals:

Population Criteria: The mean annual spawning abundance over any 13 consecutive years shall be 10,000 females. The geometric mean of the cohort replacement rate (CRR) over the same 13 years shall be greater than 1.0. The variability in cohort replacement rate is assumed to be the same as or less than the current variability.

In any case there should also be targets set for long term desired levels of abundance.

Page 67, Sacramento spring-run chinook salmon: Reference is made to a "recovery plan".

There is no recovery plan for spring-run salmon in the Sacramento watershed. This is also true for the Can Joaquin fall-run chinook salmon.

Page 68, Steelhead trout: We believe that the suggested targets for steelhead cannot be achieved without restoring naturally spawning populations of Central Valley steelhead. The ERPP needs to include more aggressive targets to address the past elimination of nearly all historical spawning and rearing habitat, due to the placement of impassable dams at low elevations on all the major tributaries, and the resultant near extirpation of native Central Valley steelhead. Targets could include restoration of access to historical habitat above the dams based on completing the appropriate investigations and feasibility studies.

Page 68: The equation used in this document to calculate the longfin smelt abundance based on outflow has been updated to the following equation (additional information can be provided to support this change):

$$\log(\text{abundance}) = 2.11(\log(\text{outflow}) - 7.02)$$

Page 69: Green sturgeon: It would be better to drop the two targets listed under the green sturgeon and adopt the targets set in the CVPIA Restoration Plan. In addition, current annual harvest rate of green sturgeon is less than 5% and is currently around 3%.

Page 69: White sturgeon: Replace the words "older than" with "age", so that it reads "...estimates of fish age 15 years." Adopt the targets set under the CVPIA for white sturgeon.

Page 69: Starry flounder: The Fall Midwater Trawl Survey (FMWT) does not adequately sample starry flounder, so maintenance of an index equal to the 1967-1974 FMWT index is not an appropriate target. The commercial catch levels are also not an appropriate target, as the commercial landings have varied with gear type, areas open or closed to fishing, etc. For example, starry flounder landings increased in the late-1980s and early-1990s in the Can Francisco area because an experimental near-shore trawl fishery for halibut incidentally caught a large number of starry flounder. When the experimental fishery was ceased, the landings of starry flounder decreased. Also, starry flounder have often been reported on the landing tickets and logs as "flounder", lumped with several other species of flatfish. Another method of index needs to be developed.

Page 69: A target should be added that maintains the compatible land use practices on present spawning areas and expanding these areas in the:

Yolo Bypass,
Sutter Bypass,
Butte Sink,
lower Cosumnes, and in wet years
the Can Joaquin River from the Stanislaus upstream to China Island-Grasslands Wildlife Area

(upstream of the Merced River).

Page 69: It isn't clear that the harvest provisions regarding splittail have any factual basis. We would be very surprised if the present harvest rate for splittail is sufficient to limit the production of juveniles.

Page 70: Maintaining a 25 year average abundance for American shad does not make sense. Is this a typo or what is the justification?

Page 70: Threadfin, inland silverside, and Wakasagi have been shown to compete with some game fish. Do we want to be advocating targets for them?

Page 71: The group of other non-native resident fish needs to be divided into the two groups indicated by the targets.

Page 71: Species such as redear sunfish, black crappie, channel catfish, and brown and black bullheads should be considered for addition to the list due to their economic importance to the Delta.

Page 71: The target should be reworded to include "greater than" and would read as follows: "...growth rates at greater than 1.0 for each...".

Page 73: The reference to salt marsh in the Delta region for clapper rail seems inappropriate. Shouldn't the reference be to western Suisun Bay? The same issue applies to salt marsh harvest mice on page 75.

Page 73, Swainson's hawk, A.1: Swainson's hawk habitat use in the Delta region depends on the existence of adequate foraging habitat within some minimum distance of suitable nesting habitat. Often this means native riparian habitat adjacent to alfalfa fields, but it can also mean exotic ornamental trees located in downtown Stockton within flight distance of suitable ag lands. The distribution of Swainson's hawk nest territories in the Delta region is not uniform and the ERPP should ultimately set its targets based on the four subunits of the Delta because the targets will vary significantly. For instance nest density along Old River and Tom Payne Slough in the south Delta vary between one-half and one mile apart. The current nest density may be higher than is listed as a target in the ERPP. Other areas in the Delta would be improved significantly if the targets are achieved. Also, it may be equally important to increase the amount of foraging habitat rather than only increase prey populations. The targets should be modified to reflect this.

Page 76: Spelling corrections.

"clift" should be "cliff"

"warbling vines" should be "warbling vireos"

This concludes our written comments. Should you or your staff have any questions about our input please don't hesitate to contact Mr. Frank Wernette at CALNET 8-423-7800.

Cindy Costa
for
Pete Chadwick
CALFED/DFG Liaison

cc: Mr. Tim Farley, IFD
Mr. Rich Elliott, R1
Mr. Banky Curtis, R2
Mr. Brian Hunter, R3
Mr. George Nokes, R4
Dr. Perry Herrgesell, BDD
Ms. Susan Cochrane, NHD

FW97a505.wpd