State of California

Memorandum

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From : Department of Fish and Game

Subject : Comments on Volume III of the Ecosystem Restoration Program Plan (ERPP)

The Department of Fish and Game (Department) has completed its review of Volume III of the ERPP. In general we found this volume to be comprehensive and well done.

The Department refrained from including comments that were primarily editorial. Instead we focused on corrections and clarifications that we believe are needed to ensure the accuracy of the ERPP and emphasized the most important issues related to developing the ERPP. Most of our comments are in the form of specific comments. They are noted below by page and paragraph. We have also included several general comments that apply more broadly to this volume.

General Comments

Pages 3 and 4: The Geographic Scope covered on pages 3 and 4 is described in this volume better than in volumes I and II, but it still needs improvement. For instance, the upper watershed, and ocean are still characterized as having only "programmatic level" actions. Since the whole document is at a programmatic level, however, there needs to be a clearer description of what distinguishes these areas from the remainder of the solution area.

The geographic description of units regarding the Delta and Suisun Bay is confusing. Part of the confusion is due to Suisun Bay and Marsh being part of the "Problem Area" but not being included in the same ecological zone as the Delta. The Delta and Suisun Bay should bwe in the same zone. The units need to be described accurately in the zone in which they are presented, and the first two zones described on page 3 rewritten appropriately.

The Refinement and Implementation section on pages 5 and 6 sounds like there isn't going to be anything other than research, short-term implementation and monitoring until the last step in the process, which could well be many years from now. This sounds like the interpretation of Adaptive Management which we most fear. Focused research is certainly not the first thing to actually be implemented. Refinement and priority setting is something which should occur

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during the remainder of Phase 2. Short term implementation has already been underway for some time. This section should be deleted or rewritten in a major way to be consistent with the following sentence in the first paragraph on page 8, "Adaptive management begins by implementing the actions most likely to achieve ecosystem implementation objectives, given today's knowledge." That and the sentence starting at the end of page 11 must be strong underlying principles.

Specific Comments

Page 1, First paragraph, Right column: Reference is made to how additional data will be acquired through research to evaluate program alternatives and options. This should be clarified since it is unclear what is being referred to by the terms "alternative" or "options". The text should state whether they are alternative targets, programmatic actions, or new actions to be defined in the future, and explain whether they will be specific actions at that point or remain programmatic.

Page 3, Geographic scope, Second paragraph: Insert "Central and" before "South" in the seventh line.

Page 4, Second and third paragraphs, Right column: The section covering the Central and South Bay and near shore Pacific Ocean should be included in Volume II as well.

Page 5, First paragraph: The explanation or definition of adaptive management provided in the first part of the first sentence is unacceptable to the Department and misrepresents what adaptive management is. We are not testing alternative ways of meeting objectives, we are instead implementing a comprehensive, large scale program based on the best available scientific information and what our most knowledgeable scientists and fish and wildlife managers know or can infer from the current state of knowledge. Adaptive management allows testing of hypotheses and provides for feedback on the success of the program to allow for the needed corrections and adjustments to ensure success and to take advantage of newly acquired knowledge.

Page 5, Last sentence, Indicators: It seems awkward to provide an example of an indicator by using a stressor, since the ERPP does not plan on using indicators for stressors. We suggest an alternative example be provided.

Comprehensive monitoring: As described above, considerations should be given to providing an alternative example.

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Phasing: Comments made on this subsection in Volume I should be addressed in all three volumes.

Page 10, Uncertainty, Third sentence: Reference to sea level rise can be made without describing global warming, thus avoiding the raging controversy about whether or not human activities associated with modern industrialized society are causing sea level rise.

Page 13, Models: The first two sentences need substantial revision. Such models are useful in evaluating hypotheses but no model with the basis described in the first sentence should be used to predict.

Page 14, Second paragraph, Right column: Since no discussion has been made regarding an ecosystem management entity reference to one should be deleted.

Page 14, Last paragraph, Right column: The provisions of an HCP are listed as potentially being undecided. It is our understanding that most of these provisions must be part of an HCP.

Page 16: We find the schematic figure on this page to be mind boggling and question its usefulness.

Pages 16 and 23: Overall strategy descriptions of the ERPP are presented starting on page 16 and again on page 23. If there is a need to repeat and if both are left inconsistencies between the two need to be resolved.

Page 17, Strategies, Last sentence: The last sentence should be modified as follows: "Ultimately, the overall implementation strategy will be influenced by factors such as the assurances package selected and whether implementation will be carried out by existing agencies and stakeholders or by a new ecosystem management entity."

The present language implies a decision has or will be made to establish a new ecosystem management entity even though there are currently viable mechanisms for implementation and substantial legal precedence and constitutional authority for managing the state's fish and wildlife.

Page 17, Third paragraph, Right column: This paragraph refers to the need for a process to adaptively manage the ERPP targets and introduces the potential structure depicted on page 18. We believe that this section should clarify how the targets currently in the ERPP may be subjected to this process now, in the immediate future, or in the long-run. Our sense is that substantial progress needs to be made on achieving the ERPP's targets, and that significant

monitoring and research data need to be gathered before a whole scale review of targets takes place or we divert our attention to adopting and meeting different targets.

Page 19, 25-Year Implementation Program: Here and in other sections there is explicit reference to a 25-year implementation program. It is our view that this may represent an overly restrictive time period. For instance, actions to restore land elevations on heavily subsided islands in the Delta may take substantially longer than 25 years to accomplish. We recommend that the program describe a two tier approach of near term actions, 1-25 year, and long-term actions 25-100 years. Again we object to reference of establishing an "independent" entity "when no decision has been made and sufficient authority is in place now.

Pages 21 and 22, Funding: We believe that it is increasingly speculative to present an estimate of $1.5 billion at this stage for implementing the ERPP. No data is provided in this Volume to support this estimate. The Department has not been presented with the background data needed to judge the accuracy of this estimate. Restoration efforts outlined in the ERPP are aggressive enough to need substantially more funding based on our experience with smaller scale restoration efforts in the Central Valley. We recommend that the estimate be deleted and more detail provided on Proposition 204 and the expected federal appropriations. At a minimum we recommend a range be shown of perhaps $1-3 billion.

This section should generally describe how other funding needs beyond those described may be met, including the funding needed to support operations and maintenance and the adaptive management program including monitoring and focused research.

Page 23, Implementation Infrastructure: Recognition of the extensive experience of the Department and Wildlife Conservation Board and the current efforts related to permit coordination should be made in this section.

Page 23 - 26, Implementation Strategies: The strategies for individual components seem largely to mention other programs and do not go very far in actually describing strategy. One obvious weakness is the invasive species section does not discuss strategy regarding controlling already introduced species vs. the prevention of additional introductions. Unless it is strengthened, it may need to be deleted. While a strategy is needed for each of these program components it may not be an appropriate element in the volume on adaptive management? It would seem more logical to include it where the programs are first described.

Page 24, Strategy for Land Acquisition and Conversion to Habitat: The reference to agricultural lands should be clarified since the intent is to improve management of existing agriculture for fish and wildlife not convert additional land to agriculture.

Page 26, First and second paragraph, Strategy for Harvest: This section should be clarified to describe the strategy not outline a measurement of exploitation and go on to say its unsatisfactory to the PFMC. An alternative approach is to say that an acceptable measure will be developed.

Page 27, Ecological Processes: The wording should be modified to remove the implication that addressing stressors will achieve restoration of ecological processes. As written the reader may conclude that restoring ecological processes are redundant when they are not.

Page 27 - 28: The context of the discussion on priorities seems confusing. Some of the discussions seem applicable to determining whether a component should be included in the ERPP, yet the section seems to be discussing priorities for implementing components of the ERPP. For example, the CALFED solution principles are obviously important in deciding whether a proposed program should be included in the ERPP, but they are not applicable to implementation priorities, which seems to be the purpose of this section. The discussion of ranking ecosystem elements also does not seem relevant here.

Page 29, First Level Species: We recommend spring-run chinook salmon and San Joaquin fall-run chinook salmon be included on this list.

Page 29 - 31: It seems incongruous to have implementation priorities of an ecosystem plan driven essentially by species, although we can understand why ESA leads to such an approach. Consider the following specific comments:

Striped bass fit in a category with fall-run salmon. The two completely dominate the economic benefits derived from fishery resources in the system, and we see little difference in the degree to which their management has conflicted with water management. While some want to downgrade striped bass because they are an introduced species, we consider that unacceptable.

One factor which does not seem to have played a role in the suggested priorities is the degree to which problems for a species occur in the problem area. We think it should. For example, steelhead trout face major ecosystem threats, but the best evidence is that those threats have very little to do with the "Problem Area" for this program, which would tend to downgrade their priority for this program.

Green sturgeon continue to be a difficult species for this program. Available records indicate that they have never been numerous in the Bay-Delta system, but have been dominant in other rivers. Hence this program probably can not contribute significantly to their recovery. Yet if they were listed, it could complicate management.

Page 32, Table 1: The emphasis on Bay-Delta Hydraulics and Bay-Delta Aquatic Foodweb should be increased in earlier years. It should recognize that the emphasis may change depending on the alternative chosen as the CALFED preferred alternative.

Page 33, Table 2: This figure makes the case we made in commenting on Volume I that the wetland categorization in the ERPP obscures the ecosystem restoration objectives of the program. In this figure, emergent wetlands are treated differently than tidal perennial and slough habitat. This is not reasonable, as their value and need relate to a single ecosystem and set of actions, I. e. there is a shortage of emergent tidal wetlands, and such wetlands should have sloughs and open water interspersed within them. We could not identify the rationale for the treatment of wetlands in this draft because the subject was left out of Appendix 3. A fundamental revision of the wetland section is needed, per our comments on Volume I.

Page 32 and 33, tables 1 and 2: There is a disconnect between these two tables in that Bay-Delta Hydraulics is focused primarily on years 11-15, while water diversions focus on years 1-10. The two are linked. Bay-Delta Hydraulics is one of the most fundamental and impacted ecosystem processes. Major treatment of hydraulics is focused on years 10-15 because of the lead time for corrective measures, according to Appendix 3. That is logical, but the same rationale is applicable to diversion effects. Instead, Appendix 3 indicates that diversion effects are dealt with principally in terms of fish screens on existing diversions.

Page 35, Column 2, paragraph 1: We do not think action-specific monitoring will be necessary for all restoration actions. While some may consider universal monitoring necessary initially while we are learning, even that may not be true. For example, fish screens on small diversions may not all need monitoring, other than inspection to determine that they were built and installed in conformance with specs.

Page 36 and 37, River and Estuarine Flow Monitoring Sub-Program: This section contends that existing flow monitoring programs are sufficient to adaptively manage the Restoration Program. While USGS has made considerable progress in establishing its network of UVM stations that network will need to be expanded to accurately monitor Delta hydraulics and need to be better integrated to support the ecosystem process restoration approach of the ERPP.

Page 38: It is probably worth noting the long-term wetland monitoring program in Suisun Marsh. There may be others.

Page 35 - 41: This is a well written and comprehensive section on general ecosystem monitoring. Some words of caution need to be introduced. The present monitoring program is expensive and will become more so as it is expanded as proposed in this document. Some

discussion is needed of lessons learned, and of some compromises being inevitable between the ideal and the practical level of monitoring based on cost.

Page 41, "Real-Time" Monitoring Sub-Program, Second paragraph: Dissolved oxygen monitoring by the City of Stockton should be added since in early fall of 1997 this was the only data available to the Department to guide its decision regarding the fall-head of Old River barrier.

Page 42, River and Delta-Channel Flow Modification: Add UVM data to the list for this restoration category.

Page 47, Table 4: Delta Channel hydraulics should be added as related ecosystem elements for the following ecological attributes; Natural water flows regime and nutrient budget and cycling, transport of organic materials and organisms, and food web support.

Page 49: The discussion of winter run seems illogical in certain respects. The abundance of winter run is the best indicator of ecological health for winter run. The abundance integrates the consequences of all of the elements listed. Knowledge of the listed elements is needed to understand the relative significance of the factors influencing health. A discussion along those lines seems more logical than saying "the ecological health of winter run chinook would integrate knowledge of ...."

Page 50 - 76: It is difficult to follow the organization of this section. The introductory paragraph does a fairly good job of setting the stage, but the following text is so long and the treatment of major subheadings is different enough to be difficult to follow. Better differentiation of headings to bring out the three major subheadings and the organization under each would be helpful. One problem is that habitat section starts with a rather long introduction before getting into specifics analogous to those in the other two sections.

The sections on Ecosystem Processes and Habitats would be much better if they provided specifics analogous to those in the Species section. The Habitat section describes the specific elements in such a repetitive and general manner that there isn't much point in even having the specific elements.

Page 51, 2nd bullet: The "germination season" being referred to for X2 should be clarified.

Page 51, Next to last bullet: Isn't sedimentation in the Bay affected by processes other than upstream current velocities and wind resuspension?

Page 53: The Data Requirements section for flood plains doesn't really describe any data needs.

Page 54: The indicators for Bay-Delta Hydraulics need to include physical information. Specifically, net velocity or flow estimates are needed at key locations. At a minimum these locations should be Delta outflow, the San Joaquin River at Jersey Point, ant the combined flow of Old and Middle rivers. While measurements of such flows would be ideal, model estimates should have sufficient accuracy for the purposes being discussed here.

Page 54, Bay-Delta Hydraulics, Indicators and Data Requirements: An indicator needs to be added which uses actual tidal flow measurement, calculated residence times, and other hydraulic related information. This information would indicate the value of the areas measured as rearing areas UVM data at key locations throughout the Delta would provide the needed data.

Page 56 and 57: Is a separate treatment of diversity needed? In Table 5, it is listed as N/A in relation to habitat, and the characteristics listed for it under zones seem to be actually indicators of connectivity. Also the paragraph on page 56 seems to deal only with connectivity. We suggest deleting the separate references to diversity.

Page 57, Data Requirements: Add detailed bathymetric data to the data requirement for tidal perennial aquatic habitat.

Page 59, Indicators, Right column: Delete the word "Delta" from list of locations to evaluate the health of saline emergent wetland habitat.

Page 59 and 60, Saline and Fresh Emergent Wetland Habitat: These sections should be expanded to reflect that there are both tidal and non-tidal components of these habitat types. The ERPP focuses most heavily on the restoration of tidal areas.

Page 61, Inland Dune Scrub: Delete reference to fish under data requirements and add terrestrial invertebrates instead.

Page 61, Perennial Grasslands: Delete fish species from data requirements and add terrestrial invertebrate instead.

Page 62, Agricultural Land: Delete fish species under data requirements and add invertebrates instead. Add pounds of grain remaining post harvest as an indicator and data requirement.

Page 63, First bullet: The criterion described in the last sentence under this bullet is inappropriate. The general point is that abundance needs to be measured at various life stages

as may be necessary to interpret observations. The sentence uses American shad and starry flounder as examples. Presumably, the suggestion is that only abundance of their young needs to be measured. Shad and salmon have quite similar life histories as related to use of the Delta, thus one could argue that similar indicators are needed. One might argue that adult starry flounder make no use of the upper estuary, so their abundance does not need to be monitored. Changes in adult abundance, however, might affect the abundance of young in the estuary and thus be important in interpreting monitoring results. It is too costly to measure multiple life stages for all species, so judgments have to be made as to priorities, but the criteria specified in the sentence under discussion is not appropriate..

Page 63, Bullets 2 and 3: We agree with the significance of these categories. Unfortunately, they are ignored in the treatment of individual species, except for the harvest of salmon and steelhead. Harvest rate information should be included for at least striped bass and white sturgeon. At a minimum, contaminant information needs to be gathered for mercury in striped bass and selenium in sturgeon.

Page 63, Column 1, last paragraph: What is an "index of biotic integrity"?

Page 63 - 76: The Indicators sections throughout the individual species sections tend to be restatements of restoration targets. It would seem more appropriate that the indicators be the specific measurements which would be made to determine whether the restoration targets are being met. For example, the indicator for delta smelt is described as being restoration of populations to the 1967-81 period, while the appropriate indicators would seem to be the specific measures of abundance and distribution needed to determine if that target were being met. Indicators are treated properly in concept in the sections on ecosystem elements and habitat, even though the measurements mentioned are not as specific as they should be.

Page 65, Indicators for Chinook Salmon: The health of San Joaquin fall-run chinook should also be defined.

Page 67: The indicators for resident and marine/estuarine species should describe measures of abundance and distribution for specific lists of species. Distribution should be described to take into account any specific needs relating to utilization of different habitats. Identification of relationships between abundance and habitat would more appropriately be left to focused research efforts, rather than being spelled out in the indicators section. That would be consistent with the treatment for other species.

Page 67, Indicators for American Shad: The reference to a baseline index of 3, 22 juvenile American shad should be rechecked to make it clear that the measurement is not an absolute measure of juvenile American shad but an index of abundance.

Page 68, Western Spadefoot and California Tiger Salamander: The implementation objective used is incorrect and should be modified.

Page 68 through 70, Indicators for Spadefoot, Tiger Salamander, Garter Snake, Clapper Rail, and Pond Turtle: It isn't clear that population dynamics or distribution pattern information are available for the 1900s for these species. Consider using a suitable habitat indicator instead.

Page 68 - 76: The Next Steps sections for the wildlife species listed in these pages fundamentally misinterpret the purpose of these sections. They should describe the next step in defining the needs for measuring indicator, rather than the next steps in managing the species.

The Data Requirements sections for wildlife tend to have the same problem. For example, data requirements for salamanders starts by calling for aerial photographs, which is appropriate for this section, but then goes on to management rather than describing data needs.

Putting this comment together with the comment above on indicators leads to a need to rewrite everything in this section except the Implementation Objectives.

Page 72, Suisun Song Sparrow: Delete reference to this species being listed.

Page 77 - 83: We assume the term "Focused Research" was coined to indicate a program directed towards the specific questions of highest priority to the success of the CALFED program. While the present draft identifies many important questions, it falls far short of defining a program meeting that description of focused research. Some of the sections pose laundry lists of questions, which while each individual one has validity, the overall list gives no indication of priority. Scientists have been struggling with some of the questions for generations. The proposal to "create mechanistic models that accurately simulate and predict any of the numerous physical, chemical or biological processes of the estuary" is particularly unrealistic in relation to today's technology.

It is probably not realistic to complete anything approaching a definitive list of focused research topics to include in the draft plan. We suggest that a few people who have had experience in administering applied research in the estuary edit the present draft to make it a more realistic reflection of initial priorities. Then leave additional refinement to the management entity ultimately responsible implementing the CALFED program. Meanwhile, those currently responsible for managing research in the estuary will continue the ongoing millions of dollars worth of studies and will undoubtedly modify ongoing programs to address some of the questions being identified in the CALFED process. The fact that the directors of