

APPENDIX 1

Council for Endangered Species Act Reliability
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June 17, 2008

VIA FACSIMILE AND US MAIL

Robert W. Johnson
Commissioner
Bureau of Reclamation
1849 C Street NW
Washington DC 20240-0001

Dear Commissioner Johnson:

CESAR is a non-profit corporation formed in part, to ensure full enforcement of the provisions of the Endangered Species Act (ESA). We have reviewed the biological assessment (BA) which was prepared by the Bureau of Reclamation (BOR) and provide comments as to its contents in the context of its prospective use as a basis for the Secretary's final biological opinion on the Operations Criteria and Plan for the Central Valley Project (OCAP).

Insofar as the BA prepared and disseminated by the BOR and provides a basis for the Secretary's determinations under Section 7(a) (2) of the ESA; only those contents based on the best available scientific and commercial data available may be used by the Secretary. The Act specifically requires that biological opinions be based on data, as differentiated from the substantial scientific information which is the less rigorous standard applied only in the 90-day listing finding defined in Section 4 of the Endangered Species Act (ESA).

The Secretary's final biological opinion will affect millions of people in California, thus the information included in the BA is highly influential. The effects of some of the information included in the BA have been enumerated most recently in hearings before Congress and include widespread socio-economic damage to the farming communities in the Central Valley of California, job and crop losses; limitation on the access to water for millions of urban and suburban residents, and significant losses of clean cheap power generation at a time when energy costs are rising astronomically. These hardships are the result of redirection of the flows and altered management of the millions of acre-feet of water stored by the dams of the State Water Project and the Central Valley Project based on the 'science' included in the BA which has been disseminated by the BOR, National Ocean Atmosphere Administration (NOAA) and the Fish and Wildlife Service (Service). The contents of the final biological opinion will govern the availability of virtually the entire water supply of significant areas of California.

The Act requires data to support the decisions made by the Secretary and those data must meet certain standards imposed by the Congress. However the BA is not a document intended to definitively identify the cause or causes of decline of any species. It is simply intended to identify all the effects of the agency action with an accurate description of the information (or lack thereof) that supports these effects.

The Secretary then makes a determination, which must be based on data, with an appropriate standard applied to those data. Nothing in the ESA forces some effect to be identified whether or not data are available for support conclusions reached about potential effect. The ESA requires only that those effects for which there are substantiating data be minimized and avoided to such an extent that the continued existence of the species is not jeopardized.

In general, the BA's deficiencies fall into 4 major categories.

1. The BA document fails to substantiate numerous statements with data or scientific analysis based on data.
2. It relies on the output of models specifically found to be incapable of producing accurate predictions.
3. It describes the effects of the project based on speculation and hypothesis rather than data.
4. It acknowledges only selected data and ignores significant scientific data.

The following specific comments address the major failings of the BA with respect to the requirements of the ESA, the Administrative Procedures Act and other applicable statutes.

The BA fails to provide a list of references which can be reviewed. In addition, to date, none of the appendices to the BA which presumably provide a detailed explanation of the scientific basis for the BA are available. Repeated attempts to gain access to these appendices have been unsuccessful. Failure to provide this information is inconsistent with the requirements of the law. It is not possible to prepare a complete set of comments without access to these references and appendices. Even more importantly, lack of access to these documents limits any ability to reproduce the results of the analyses which form the basis of the BA. If the data and analysis to support the contents of the BA are not available, the contents are inappropriate for use in the final biological opinion of the Secretary as they will not meet the federal statutory requirements governing the information used such opinions.

Delta Smelt

- **The BA states that there has been a sudden, overlapping, and striking decline in Delta Smelt abundance. This statement ignores the criticism of that view which was provided in a formal peer review document¹. Which contained the following statements:**
 1. 'Although the current round of projects has been directed toward identifying the causes of a recently perceived 'step-change' decline in pelagic fish abundance, the historical record on pelagic species abundance indicates a persistent downward trend spanning more than two decades within the context of the record span (1959-2005).'
 2. Analysis of the abundance data that led to the conclusion of a significant recent step change was based on a single model that did not account for the dynamic nature of population variations.
 3. '...a single source of data (fall midwater trawl survey) provided most of the evidence presented to support a recent general step decline in the abundance of pelagic organisms, while other data sources (e.g., Bay study midwater and otter trawls, fish salvage data) would not have led to the same conclusion.'

¹ Review Panel Report: San Francisco Estuary Sacramento-San Joaquin Delta Interagency Ecological Program on Pelagic Organism Decline, 2005

4. 'For this and other reasons, the results are not convincing.'

The BA ignores this clear statement of skepticism and includes the conclusion as though it is accepted fact, and invites the Secretary to make determinations based on the statement.

- **The BA fails to recognize the significant gaps in knowledge related to the basic biology of the smelt. The existence of these gaps were pointed on in the peer review² and in other documents³**
 1. 'There is need for an expanded effort to fill information gaps on basic natural history of the species targeted by the program in order to characterize and understand pelagic organism decline. Studies involving crucial habitat (e.g. spawning habitat for delta smelt) or the estimation of vital rates (e.g. mortality and growth rates)...'
 2. 'Key pieces of basic information appear to be lacking on the habitat requirements and early life stages of pelagic species of interest.'
 3. '...there are few reliable estimates of vital rates (e.g. stage-specific growth and mortality rates) required to adequately model spatially-explicit population dynamics of pelagic species under different scenarios.'
 4. Spawning requirements of the smelt are not known.
 5. There is no information, beyond speculation on as to where the eggs of delta smelt are found.
 6. There is no accepted sampling method that produces statistically valid abundance estimates.

Despite the known limitations on available data, and the clear peer review pointing out that limits on the understanding of the biology of the smelt necessarily limits the ability to model effects, the BA fails to recognize these limitations. Most importantly, in the peer review document, the reviewers state:

The existing time series is insufficient for evaluating and designing management actions to minimize effects of whatever factor or synergistic suite of factors is found to cause pelagic organism decline.

However, the BA fails to recognize this limitation, and invites the Secretary to make a regulatory determination based on information and modeling incapable of accurately predicting system behavior.

- **With no scientific basis, the BA effectively if not specifically implies that CVP and SWP pumping has an important effect on Delta Smelt abundance. This is concluded despite the fact that to date, despite numerous investigations, no important population effects have been identified related to pumping.**
 1. The BA states as fact that pumping effects can be measured. It fails to provide the entire results of the research, which found that measurements identified a 1-2% effect on population, While this effect is measurable, it is not important to the overall population⁴
 2. Numerous analyses of entrainment effects have failed to identify any effects.

² Ibid.

³ Bennet 2005, Mongan and Miller 2008

⁴ Manly and Chotkowski. 2006;

3. The BA fails to note that in 2007 the Pelagic Organism Decline Management Team (POD) reported to the State Water Resources Control Board that they had been unable find a statistically significant correlation between recent years' high salvage and the Delta Smelt Decline.
4. Estimates of entrainment have varied between 18 and 40%; this should produce effects on subsequent spawning abundance. To date, no such effect has been identified.
5. The BA references a theory that export effects manifest later than the year of occurrence. No data or analysis supports this theory.
6. The peer review of the POD work had this comment:
"The data analyses and dynamic models lack the sophistication to match the complexity of the dynamics in the hydrological and population/community dynamics of the Bay-Delta system."
7. Peer Reviewers also noted that:
'The analyses that identified step changes in the abundances of delta smelt and other pelagic organisms were based on a statistical model that failed to account for even the simplest kind of population dynamics'
8. Finally, peer reviewers noted:
'The emphasis on characterizing recent changes in water project operations in an attempt to account for an apparent step-change in pelagic fish abundance is understandable in terms of political pressure to do something now. However, if pelagic organism decline cannot be understood from an historical perspective, it would seem there is little chance of identifying a specific cause(s) for what is only the last portion of the variation in the record of fish abundance.'
9. Empirical evidence does not support pumping as the primary cause of the decline of Delta Smelt. Since the listing of the smelt, regulatory actions taken by the agencies have focused on controlling entrainment at the pumps and to date, no improvement in abundance measures have occurred, in fact, the opposite has occurred, the smelt have continued to decline.

The information regarding the effects of CVP and SWP pumping is the single most important conclusion of this BA. Any control on pumping as a result of the biological opinion which relies on the information in the BA will have effects exceeding hundreds of millions of dollars and untold economic and social disruption. There is no foundation in data or analysis for the conclusion that CVP and SWP pumping is responsible directly or indirectly for declines in abundance.

- **While insisting on emphasizing effects of the CVP and SWP pumping based on the largely unsubstantiated analyses included in the POD 2007 Synthesis, the BA ignores other variables. A partial list includes:**
 1. Good correlations exist between spawning abundance and the previous year's spawning abundance and prey densities;
 2. Good correlations exist between spawning abundance and water temperature in the spring and summer;
 3. The sudden change in rice decomposition requirements is roughly coincident with recent pelagic organism declines;
 4. The implementation of the federal EPA advanced treatment rule for disinfection by Publicly Owned Treatment Works is roughly coincident with the pelagic organism declines;

5. The implementation of Vernalis Adaptive Management Program actions may affect Delta Smelt abundance;
6. The invasion and spread of *corbula amurensis* which effectively removes food supply for delta smelt prey may affect food supply;
7. The dramatic growth of *Mycrocystis aeruginosa* an algae that produces toxins may affect smelt abundance.
8. Predation effects are known to exist based on data demonstrating changed behaviors in certain piscivorous fish.

The function of the BA is not to identify the cause of the delta smelt decline, its function is merely to identify what, if any, effects are the result of project operations. The above list is merely to illustrate the number of other potential causes of the delta smelt's decline. Failure of the BA to identify other potential causes of delta smelt decline, leaves an impression that the project operation is the only possible cause of the decline. That is misleading and will result in the Secretary making a determination that is not supported by the data.

- **The BA relies on modeling results which are incapable of accurately modeling the Delta Smelt ecosystem and the effects of changes in variables. A 2005 peer review of the POD work found:**
 1. *‘...The existing time series is insufficient for evaluating and designing management actions to minimize effects of whatever factor or synergistic suite of factors is found to cause pelagic organism decline....’*
 2. *‘...The data analyses and dynamic models lack the sophistication to match the complexity of the dynamics in the hydrological and population/community dynamics of the Bay-Delta system...’*
 3. *‘...statistical analyses conducted so far as part of the IEP program have tended to be relatively simple and exploratory in nature. In moving ahead, it will be important to base the analysis of data on a scientific model of the ecosystem in the upper San Francisco Estuary...’*
 4. *‘...In such a complex situation, simple analyses – for example, those aimed at correlating one variable with another – may be uninformative or even misleading...’*

Yet, the BA ignores these limitations and identifies outputs of these insufficient models as the basis for regulatory decisions which will have dire consequences for tens of millions of people.

- **The BA fails to recognize other causes of Delta Smelt decline and in doing so, creates the false impression that project operations are the only possible cause of the decline. While there may be little information as to what and how much influence the effects of these potential causes have on Delta Smelt abundance, failure to identify them, particularly in light of the lack of information supporting the pumps as a primary factor in the decline is negligent at least.**

The peer reviewers noted:

‘...There is a paucity of historical data on contaminants and their potential effects in the Delta region of the San Francisco Estuary due to both the resistance of some government agencies to more actively investigate them and in the long held belief of many agency biologists that the existing problems in the Delta were due to other factors...’

The BA identifies only a few of the factors the peer reviewers suggested as potential causes of the decline of delta smelt. This is understandable, since the wildlife agencies have spent little time examining these factors, there is little information to support or refute their effect on the smelt.

The BA incorrectly correlates X2 with abundance despite data and scientific studies to the contrary. Abundance of some species in the delta was initially explained by the amount of freshwater outflow as indexed by X2.⁵ While recognizing delta smelt are sensitive to salinity levels at various life stages, the abundance of delta smelt is not easily explained by X2 or its analogue, freshwater flow⁶.

Nevertheless, the BA implicitly assumes that X2 does influence delta smelt abundance. This is a critical error. If the Secretary relies on this implicit error, the biological opinion will in fact be based on it. The regulatory error which flows from this is that delta outflows may be erroneously tied to X2 in a futile attempt to minimize and avoid any effects due to project operations and significant economic and social consequences will flow from that decision with no benefits accruing to the species.

The BA states:

*'With respect to an indirect effect [of the project], a long term upstream shift of X2 during fall has negatively affected delta smelt habitat and has been linked to changes in delta smelt abundance.'*⁷

This statement is included despite peer reviewed work demonstrating no correlation between X2 and delta smelt abundance.

The BA relies on 'best available science' rather than the statutorily required 'best available data'.
The BA states:

'...many studies used for the recent POD synthesis are works-in-progress that have not reported final results. Preliminary results from these studies have been provided whenever possible, but peer-reviewed products from these studies may not be available for some time to come. As a consequence, while this review uses such results because they represent the best available science, Baxter et al. (2008) encouraged users of their POD synthesis report to be cautious when evaluating the relative importance of the different factors. Specifically, statements not based on well-developed and peer reviewed literature should be viewed with more skepticism.'

And yet, the BA includes the above referenced statements for the Secretary to be used in the decision on the biological opinion without appropriate qualification and without noting they do not meet the standard for the ESA or other existing statutory requirements.

Summary

The BA presents an inaccurate and misleading picture of the data and analyses related to Delta Smelt life history and the known effects of project operation.

The BA presents pages and pages of discussion of data on entrainment. The summer and winter entrainment numbers are discussed as are the wet year and dry year numbers. Possible habitat changes and other potential effects are discussed in the context of entrainment effects. What is given little attention and no more than a throwaway line, is the extensive work that has been done to identify entrainment effects based on data. Numerous studies have examined entrainment numbers in the context of wet and dry years, and abundance indices. A study by Manley, one of the world's foremost experts on these issues demonstrated a small but unimportant effect on delta smelt abundance. Manley

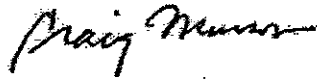
⁵ Subsequent analysis of the original data demonstrated that the correlations were spurious and that the actual correlation was with the occurrence of wet years and that in non-wet years, there were no X2 correlations

⁶ Bennet 2005, p32

⁷ Page 13-2 of the BA

described this as a 'wiggles on the trend line' and concluded that some other factor or factors were responsible for the decline in delta smelt abundance. No other study has demonstrated any effect from project pumping operations.

Sincerely,

A handwritten signature in black ink that reads "Craig Manson". The signature is written in a cursive, slightly slanted style.

Craig Manson
Executive Director
Council for Endangered Species Act Reliability

cc: Steve Thompson

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