



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
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IN REPLY REFER TO:  
FWS/R8/FAC

JAN - 9 2015

## Memorandum

To: Regional Director, Bureau of Reclamation, Mid-Pacific Region  
Sacramento, California

From: Regional Director, Fish and Wildlife Service, Pacific Southwest Region  
Sacramento, California

Subject: Reinitiation of Consultation on the 2008 FWS OCAP Biological Opinion and  
Conveyance of Revised Incidental Take for the 2015 Water Year

This memorandum acknowledges, and accepts, your request, dated January 9, 2015, to re-initiate the Endangered Species Act Section 7(a)(2) consultation on the 2008 FWS Biological Opinion (2008 BO) on Coordinated Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP). Reclamation requested reinitiation of Section 7 consultation on the estimated adult Delta Smelt incidental take authorization for WY 2015 associated with implementation of the CVP and SWP. The event that triggered the need to re-initiate consultation was incidental take of Delta Smelt, a threatened species, during the course of water operations that were conducted in accordance with the 2008 opinion.

While in re-initiation, the Service will work with the Bureau of Reclamation (Reclamation) to determine if any modifications are needed to current operations to lessen the likelihood of unanticipated incidental take of Delta Smelt.

As requested, this memorandum includes our response to your earlier request to consider Reclamation's Cumulative Salvage Index (CSI) proposed alternative method to calculate take likely to occur while implementing the Reasonable and Prudent Alternative of the 2008 BO (hereafter "alternative method").

The alternative method was reviewed by the Independent Review Panel for the 2014 Long-term Operation Biological Opinions (LOBO) Annual Science Review in a report to the Delta Science Program. The panel was critical of both the alternative method and the method prescribed in the 2008 BO. In the opinion of the panel, because both methods rely on a relationship between the Fall Midwater Trawl and winter salvage, neither effectively links entrainment take to impacts at the population level. The panel observed that there is substantial uncertainty associated with both the Biological Opinion and alternative method of calculating CSI and when this uncertainty is considered, values generated by each method are not statistically distinguishable. Consequently, the

panel concluded it had no basis to recommend replacement of the current method with the alternative method. However, the report also did not find the alternative method to be poorer than the method prescribed in the Biological Opinion.

Given the panel's conclusions, the Service believes that the present method of estimating incidental take is in need of revision along the lines recommended by the panel. Specifically, a new approach is needed that directly estimates entrainment loss as a proportion of the population, or, alternatively, that allows measurement of entrainment in terms of number of fish lost due to the effects of export pumping while also providing improved overall population size estimation; the combination would allow entrainment loss to be expressed as a proportion of the population. There are several approaches to accomplishing this that are currently under development that the Service is aware of. They include work underway by the Service to develop a Delta Smelt Life Cycle Model, and its off-shoot studies; also, there is pertinent work proposed by the Smelt Scoping Team as part of the Collaborative Science and Adaptive Management Process. None of these efforts has at the present time yielded a mature product that is suitable for application to address this issue.

The Service has reviewed Reclamation's proposal in light of the panel report, and has concluded that the alternative method, with modification, represents a viable interim approach to addressing incidental take while a new method conforming to the requirements set forth above is developed. This conclusion is based on the following analysis. First, the alternative method represents the same approach to incidental take estimation as the method set forth in the Biological Opinion, with the exception that the alternative method relies on a calculation based on a larger sample of data. Hence, the approach is congruent with the method the Service has already analyzed. Second, the panel's analysis and the Service's own internal analysis reveal that the CSI statistic as used in both the Biological Opinion and the alternative method is extremely noisy, making substantially different numerical CSI values statistically indistinguishable from one another. Third, a flaw the panel identified as unique to the alternative method approach, that involves the joint use of modeled Old and Middle River (OMR) flow data in conjunction with historical Secchi depth measurements, is mitigable via a method provided by the panel. The Service has followed the advice of the panel, as described below.

To fix a flaw in Reclamation's alternative method, the independent panel suggested the use of a Monte Carlo procedure to make predictions of future CSI values for a variety of OMR and Secchi combinations using the alternative method model for CSI. A description of the steps taken to implement that procedure, as well as the resulting estimated distribution of CSI, is described in the attachment.

For water year 2015, the current method resulted in an allowable incidental take (expanded number, rounded to the next higher integer) of adult Delta Smelt of 78 and an early warning value of 58 adult Delta Smelt (75% of 78). Given the considerations set forth above, the Service has decided to use the current method and the result of 78 adult Delta Smelt as the early warning indicator and the result from alternative method, as modified by the application of the Monte Carlo method, of 196 adult Delta Smelt as the allowable incidental take of adult Delta Smelt for Water Year 2015. If the early warning indicator of 78 adult Delta Smelt is reached, Reclamation, working with State partners, should closely monitor environmental conditions and water operations to ensure entrainment events do not result in incidental take (expanded number) that exceeds 196 adult Delta Smelt this year.

As our initial response to your request, the Service approves implementation of the proposed CSI and associated ITL changes described above. This is intended to be incorporated as an interim measure to be used until it can be replaced with a proportional entrainment method as described above. Although this revised calculation results in a higher estimate of the take that could occur in this water year due to project operations as restrained by the 2008 BO and its Reasonable and Prudent Alternative (RPA), the BO and RPA's restraints, as well as its conclusions about the effects of the projects, are not changed by the this interim measure. The Service understands the importance of continued operation of the Projects in this year to meet health and safety and other critical needs, we will work with you through this reinitiation of section 7 consultation as Water Year 2015 hydrology and drought response actions continue to develop.

Attachment

**Attachment: Monte Carlo Correction Recommended by the Independent Review Panel**

In their 2014 report, the Independent Review Panel for the 2014 Long-term Operation Biological Opinions (LOBO) Annual Science Review suggested the Service might improve the alternative method. Their advice was to "...repeatedly choose random, independent values of Secchi and OMR from their respective distributions, which could be estimated from the 18-year record. The random (OMR, Secchi) pairs would then be inserted into the regression model, to repeatedly predict CSI." (Page 28, paragraph 3) Given that there are 18 of each used to fit the model, there are  $18 \times 18 = 324$  unique combinations, all equally likely. If one draws at random, repeatedly and without replacement, from each set of 18 numbers, i.e., a Monte Carlo procedure, the asymptotic distribution of results is simply the frequency histogram of the 324 predictions.

The 18 pairs of OMR and Secchi values used to make predictions were taken from Table 1 of the 19 September 2014 MWD draft proposal (titled "Proposal for Calculating Cumulative Salvage Index Values Used for Estimating Take Likely to Occur under the USFWS Old and Middle River Flow RPA for Adult Delta Smelt"). The values are listed below.

OMR:

-5589.760 -4185.090 -2385.090 -1085.170 -898.787 -5151.930 -5409.310 -7304.400 -8458.510 -  
8557.460 -5395.440 -1955.200 -5855.620 -3643.160 -3291.360 -4646.170 -2412.670 -3538.800

Secchi

25.0 64.7 10.9 34.6 33.9 51.0 37.5 37.8 28.2 29.7 50.2 30.5 57.9 25.3 71.2 57.5 65.4 62.3

Predictions of CSI were made with the following model:

$CSI_{\text{predicted}} = 10^{(1.6411352331 - 0.0298007791 * OMR - 0.0001078126 * Secchi)}$

The table below also lists the percentiles and the corresponding Incidental Take Limit (rounded values) assuming a FMWT Index value of 9.

Percentile	5%	10%	25%	50%	75%	80%	90%
CSI	0.89	1.20	2.33	7.64	17.91	21.81	33.68
2015 ITL	8	11	21	69	161	196	303