United States Department of the Interior

BUREAU OF RECLAMATION
Mid-Pacific Region
Bay-Delta Office
801 I Street, Suite 140
Sacramento, CA 95814-2536

IN REPLY REFER TO:

BDO-100
ENV-1.10

DEC 05 2011

Ms. Maria Rea
Supervisor, Central Valley Office
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Dear ~~Ms. Rea:~~ Maria

The Bureau of Reclamation (Reclamation) is responding to Term and Condition 2a in the National Marine Fisheries Service (NMFS) 2009 Biological Opinion (BiOp) for the Long Term Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP). Reclamation and the Department of Water Resources (DWR) appreciate NMFS selecting and funding an independent contractor to document, develop, and recommend the best technique to quantify incidental take of winter and spring-run Chinook salmon, Central Valley steelhead, and the southern distinct population segment (DPS) of green sturgeon at the CVP and SWP export facilities (Jahn 2011). In accordance with BiOp Term and Condition 2a, Reclamation is proposing a process and timeline for adapting the technique recommended by Dr. Jahn that incorporates interagency and independent review.

Reclamation and DWR are recommending a two-year study in which the current loss quantification calculations for winter and spring-run Chinook salmon and Central Valley steelhead remain in use while the calculations proposed by the independent contractor (Jahn 2011) are evaluated. During the next two water years (2012-2013), a comparison of current and proposed loss calculations will be documented in the *Annual Salmonid and Green Sturgeon Incidental Take and Monitoring Report* prepared by DWR and Reclamation. Additionally, evaluation of the current loss calculation for Chinook and expanded salvage calculation for steelhead versus the alternate calculations (Jahn 2011) will be discussed and documented by the Delta Operations for Salmon and Sturgeon (DOSS) workgroup. For evaluation purposes, we recommend that the proposed calculations use the medium survival rates for steelhead and Chinook (Jahn 2011) and assume that each facility entrains fish independently. Assuming independent entrainment will exclude from the analysis any days not producing a count of the species at a given facility. This timeline for evaluating the loss calculations will allow for loss and salvage monitoring of two water years and comparisons to determine the efficacy of the alternate calculations (Jahn 2011). Two years of results and any resulting recommended adaptation of the current loss calculations will be provided to the 2013 BiOp Integrated Annual Review Workshop for independent review.

In 2012, Reclamation and DWR propose to complete a sensitivity analysis of the alternate loss quantification calculation (Jahn 2011) to inform future near- and long-term implementation of additional facility studies. A sensitivity analysis of the alternate calculation equations will be a critical step for linking loss measurement with discrete parameters in the loss equations. The alternate loss calculations (Jahn 2011) contain numerous facility-specific parameters influencing survival. A sensitivity analysis may strategically guide Reclamation and DWR studies and improvement to aspects of the facilities which have the largest impact on loss estimation and its accuracy and precision. Results of the sensitivity analysis and its interpretation will be discussed at the interagency Tracy Technical Advisory Team (TTAT) meetings. In addition and as an attachment to this letter, Reclamation and DWR are providing comments on the recommended studies in Jahn (2011), in light of its proposed calculation equations for estimating loss.

Reclamation has not studied survival of Central Valley steelhead at the Tracy Fish Collection Facility. Such a study will be completed in 2012 and 2013 to reduce uncertainty concerning steelhead incidental take estimation. These studies and their results will be discussed at the interagency TTAT meetings.

No equation for quantifying southern DPS green sturgeon loss was provided in the Jahn 2011 report and no studies have been undertaken to quantify required parameters for such an equation. Although green sturgeon salvage does occur, no pattern related to hydrodynamics or biological processes has been identified. Reclamation and DWR recommend estimating incidental take of green sturgeon by using the expanded salvage estimate until such time as juvenile green sturgeon are available for research or a surrogacy methodology is developed to use white sturgeon for green sturgeon. In coordination with the availability of fish, a study could be developed to estimate necessary parameters for a sturgeon loss equation.

Reclamation and DWR anticipate potential changes in loss equations may be necessary, but implementation of alternate equations (Jahn 2011) may have consequences regarding exceedance of incidental take limits. Two years of interagency evaluation will provide for coordinated review and identification of issues surrounding the alternate equations and the utility of the related confidence intervals regarding exceedance of take and density triggers. This information will be provided to the 2013 BiOp Integrated Annual Review Workshop panelists for independent consideration and refinement of the most appropriate loss calculation equations. Any parameters used with new or existing equations should be evaluated on a regular cycle to take into account survival improvements, and resulting changes to incidental take, due to project modifications. Reclamation and DWR recommend revisiting additional changes strategically on a 7- to 10-year cycle of facility investigation, investment, and monitoring to further refine the calculation parameters. This will provide time for better adaptive management of the take limits in the future.

I appreciate your consideration and would greatly appreciate your approval of the proposed recommendations for quantifying incidental take of salmonids and green sturgeon at the Federal and

State export facilities. For further discussion, you or your staff may contact me at (916) 414-2401 or sfry@usbr.gov.

Sincerely,

Susan M. Fry
Area Manager

cc: Ron Silva
TFFIP Program Manager
Bureau of Reclamation
16650 Kelso Rd
Byron, CA 94514

Ms. Kathy Kelly
Chief, Bay-Delta Office
California Department of Water Resources
1416 9th St, Room 215-37
Sacramento, CA 95814

Ms. Heidi Rooks
Chief, Environmental Compliance
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Reclamation and DWR comments
on Jahn 2011's *General guidelines for future studies*

1. Joint studies to determine the spatial extent of above-background predation of Chinook and steelhead in Old River with respect to distance from the export facilities.

Comment: The incidental take calculation proposed in Jahn 2011 does not incorporate background predation in Old River into estimating incidental take or loss. Reclamation and DWR are concerned with the feasibility and cost of such a study. Examination of background levels of predation would be difficult if not impossible, as Delta exports would have to cease or be greatly curtailed for an extended period of time. Larger investigations, such as the fish monitoring studies for VAMP and NMFS BiOp's 6-year acoustic telemetry study, are already meant to quantify survival in Old River. Although the VAMP fish monitoring is no longer occurring, the 6 year study will continue through 2016.

2. Survival of steelhead under the influence of CVP pumping (controlled for nonparticipation and entrainment at SWP) within the area defined in #1 and with normal louver cleaning schedules.

Comment: This is a critical future study, since Jahn 2011 used studies from the SWP to parameterize survival of juvenile steelhead at the CVP. This study should receive priority attention so steelhead loss calculation for the CVP is accurate given the unique features of the TFCF.

3. Joint studies to determine survival of Chinook under the influence of both facilities (conditioned as in #2) under the range of flows and export intensity anticipated in the near future.

Comment: Studies that integrate both facilities influence on survival of Chinook and steelhead have been pursued through the VAMP fish monitoring and NMFS BiOp 6 year acoustic study. Although the VAMP fish monitoring is no longer occurring, the 6 year study will continue through 2016.

4. Determination of predation intensity on salmonids at the release sites in the western Delta

Comment: The proposed incidental take calculation in Jahn 2011 does not incorporate post-release predation as a parameter for estimating loss. Currently, post-release losses have very little influence on overall survival of salmonids as most fish are lost prior to the fish facilities. We propose that priority and funding be given to addressing pre-screen loss rather than post-screen loss. The effectiveness and utility of this study deserves revisiting when Federal and State export facilities improve pre-screen survival. In response to RPA Action Suite IV.4, DWR and Reclamation have established a Release Site Technical Team and are evaluating methods to reduce release site predation. Any further investigation of predation intensity at western Delta

release sites will be coordinated through the interagency Release Site Technical Team and Central Valley Fish Facilities Review Team.

5. Louver efficiency studies using white sturgeon as a surrogate species for green sturgeon (and with louver cleaning at CVP).

Comment: Currently, DFG will not allow the use of hatchery white sturgeon due to white sturgeon Iridovirus. Reclamation and DWR will continue working with DFG to satisfactorily resolve this issue. Alternatively, Reclamation and its consultant (UC Davis) are proposing to propagate southern DPS green sturgeon for other NMFS BiOp requirements and any propagation program should consider the research needs for other aspects of the NMFS BiOp. Another option could be laboratory-based evaluations of louver efficiency and predation on green sturgeon juveniles. Such experiments could utilize Northern DPS green sturgeon or hatchery reared white sturgeon, but would be more costly and difficult to apply directly to "real world" conditions.

6. Estimation of relevant differences in performance between experimental subjects and the wild fish of interest

Comments: There is no viable source of wild ESA-listed salmonids, especially for mark-recapture studies, for which Reclamation and DWR have been able to get permission to use. Alternatively, laboratory studies could be developed to examine these differences. Proposed studies could utilize salvaged fish and could include predator challenges and swimming performance tests to evaluate the relevant differences in performance between wild and hatchery fish. Laboratory studies, while difficult to apply to "real world" conditions and more costly, could require a smaller sample sizes.

7. Detailed examination of the Delta Model of Chinook run assignment, along with compilation of better statistics on emergence dates.

Comment: Reclamation and DWR are studying results from the report 'Comparison of genetic versus Length at Date run assignments for juvenile Chinook salmon at the State and Federal south Delta salvage facilities' (Harvey and Stroble 2011). Reclamation and DWR will be working through the IEP Genetics PWT to evaluate genetic run assignment methods. These may be ready to be incorporated into a new loss calculation technique in 2013.

8. Periodic reevaluation of the survival estimates as conditions change.

Comment: Reclamation and DWR agree with this recommendation. We should develop studies that are easily repeatable and streamlined to minimize costs. Documentation of SOP's and study methods should be emphasized to make repeatability and implementation easier.

9. At some future time when all parameters are estimated with three-digit precision, it would be advisable to re-visit the correction for autocorrelation in the standard error of the salvage, which uses a somewhat arbitrary criterion for its application and an approximation to calculate the correction factor.

Comment: Reclamation and DWR think that the correction for autocorrelation should be left out of a loss calculation technique. Although it makes sense mathematically given the approach used by Jahn (2011) for his calculation, we do not see the benefit of including it because it does not appear to make a significant difference in the resulting standard error.