



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

In reply refer to:

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Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12.3
888 First Street, NE
Washington, D.C. 20426

ORIGINAL

Subject: FERC No. 2299-060 – Don Pedro Project, Tuolumne River Fisheries Study Plan

Dear Secretary Bose:

The U.S. Fish and Wildlife Service (Service) provides these comments on the Commission's Preliminary Staff Analysis (see e-Library no. 20070619-0175 [June 15, 2007]) of the Tuolumne River Fisheries Study Plan (Preliminary Staff Analysis) submitted by the Modesto and Turlock Irrigation Districts (collectively, "Districts") (see e-Library no. 20070402-0040 [Mar. 20, 2007]) as well as the Districts' response to the Preliminary Staff Analysis (see e-Library no. 20070718-0082 [filed July 16, 2007]). These comments are provided in accordance with provisions of the Federal Power Act as amended (16 U.S.C. §791 *et seq.*), the Fish and Wildlife Coordination Act (16 U.S.C. §661 *et seq.*), the National Environmental Policy Act (42 U.S.C. §4321 *et seq.*), and the Endangered Species Act.

As we have previously brought to the Commission's attention, the District's Fisheries Study Plan has many deficiencies. The Service stands by the recommendations made in the draft *Limiting Factors Analyses & Recommended Studies for Fall-run Chinook Salmon and Rainbow Trout in the Tuolumne* ("Agencies' Draft Limiting Factors Analyses"), which was submitted to the Commission as Attachment 1 to the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the California Department of Fish and Game's letter filed with the Commission on March 8, 2007 (see e-Library no. 20070314-0089). This document summarized evidence that the number of adult Tuolumne River fall-run Chinook salmon produced at a given spring flow has significantly declined by an estimated 50% (mean of 6,805 recruits) since the FERC Settlement Agreement (FSA) was implemented in 1996. The decline is statistically significant based on an F-test comparison of two flow-recruitment regression models: one based on the

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period from 1980 to 1990 and the other based on the period from 1998 to 2003. Furthermore, this decline has continued through fall 2006, when the escapement was estimated at only 625 fish. We recommend that this long-term decline justifies the need for a robust study plan that includes all of the study elements in the Agencies' Draft Limiting Factors Analyses related to project operations. In our analysis and recommendations to the Districts and the Commission, we address the issues we believe are the responsibility of the Districts and do not expect the Districts to be responsible for determining what is limiting salmon production in the Tuolumne River.

We are also concerned that the minimum flow requirements specified in the FSA do not protect the resident and anadromous forms of rainbow trout in the Tuolumne River. Moreover, the Districts' draft study plan will not provide information needed to set instream requirements for Central Valley steelhead. The National Marine Fisheries Service listed the Central Valley steelhead Distinct Population Segment as threatened on January 5, 2006. The listing includes all naturally-produced Central Valley steelhead in the Sacramento and San Joaquin basins. Eleven adult Central Valley steelhead were observed migrating upstream at the counting weir in the Stanislaus River between October 25, 2006 and March 11, 2007 and it is likely that Central Valley steelhead occur in the Tuolumne River as well. The Agencies' Draft Limiting Factor Analyses describes studies that are needed to protect both the resident and anadromous forms of rainbow trout in the Tuolumne River.

The following are examples of some of the more substantial deficiencies in the Districts' draft study plan:

1. The Districts should be responsible for fully implementing fishery studies that are adequate to reach statistically valid conclusions. In many instances, the Districts propose to conduct studies which are insufficient in one or more of the following ways: duration, quantity of tagged fish, and geographic coverage of monitoring locations. The resulting data will not produce meaningful conclusions. In addition, the Districts' rotary screw trap procedures for deployment and calibration must be modified to ensure that useful data are collected.
2. Studies are needed to evaluate the importance of winter flows on fry survival. The population analyses presented in the Agencies' Draft Limiting Factors Analyses suggest that prolonged high winter flows sufficient to inundate floodplain habitats may be critical to the production of smolt-sized fish and subsequent adult recruitment. Fry survival studies will require an experimental flow schedule that provides prolonged flow releases that substantially inundate floodplain habitats during February and March.
3. Fish health surveys are needed to evaluate the effects of flow on food resources¹, disease², and contaminants³. Juvenile fish health studies should be implemented because the project operations affect water flows and water temperatures, which affect food requirements, food production, disease, and contaminant impacts.

¹ Lipid reserves in muscle tissue

² Columnaris, Bacterial Kidney Disease, and Parasitic Kidney Disease have been identified in juvenile fall-run Chinook salmon collected in the San Joaquin Basin.

³ Toxic insult to the kidney and liver.

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We also concur with the Conservation Groups (see e-Library no. 20070716-5028 [July 16, 2007]) that the Tuolumne River Technical Advisory Committee (TRTAC) should not be the venue to resolve the outstanding study issues as described on page 8 of the Preliminary Staff Analysis. These study details listed (study duration, number of samples, number of tests, etc.) should be determined by the Commission and not left to the TRTAC. To date, the Districts have not facilitated TRTAC meetings in an objective manner nor worked with the agencies and others in good faith to resolve issues related to monitoring, studies, projects or other topics. We request that Commission staff resolve the outstanding study issues.

SPECIFIC COMMENTS

We provide the following specific comments on the Commission's June 15 letter.

Instream Flow Issues

Commission Staff Conclusion: "*In particular, more smolt production data are needed for high flow years, which would likely necessitate the Districts releasing more water than required during the period of study (roughly April to May). The Districts do not believe these studies are necessary and instead propose experimental pulse flows that are short in both magnitude and duration and are within the current flow schedule requirements. Staff believes the Districts should develop a study that tests moderately high flow conditions (>4,000 cfs average Modesto flow during April-May) at least once during the next four years to produce smolt production for high flow conditions.*"

Districts' Response: "*The Districts recognize there has already been three years of production data obtained with such high flow conditions using rotary screw traps in 1998, 2005, and 2006 (see Report 2006-5).*"

Service Comment: We reiterate our recommendation that the study details should not be left to the TRTAC for resolution. Additional smolt production data are needed for high flow years because it is not possible to estimate smolt production based on the Districts' rotary screw trap studies conducted in 2005 and 2006. In 2005, the Districts did not conduct experimental releases to evaluate trap efficiencies and so it is impossible to evaluate whether potential changes in channel morphology or trap location in 2005 would preclude the use of efficiency data collected during other years. In spring 2006, the Grayson trap was removed on April 12, 2006 and deployed to a new location on April 21, 2006. No smolt-sized efficiency studies were conducted prior to April 12, 2006 at the original Grayson site before the trap was moved. Furthermore, too few tests were made for smolt-sized fish at the second Grayson (5 tests) and Waterford (7 tests) trap sites considering that many of the tests resulted in either one recapture or no recaptures and the flows at Modesto ranged between about 3,100 and 9,200 cfs. Similarly too few tests were made with fry: less than 240 fry were released during each of five studies at the Grayson sites and four studies at the Waterford site. No tests were made with parr-sized fish (50-70 mm fork length) at either trap site in 2006. Therefore, it is not possible to accurately estimate the number of smolt outmigrants at the Grayson trap site for either 2005 or 2006. The Service recommends the Districts ensure collection of additional

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smolt production data that is adequately calibrated when flows exceed 4,000 cfs throughout the April-May period.

Districts' Response: "*The Districts are willing to provide an average flow of 4,000 cfs or more during April-May of one year during the period 2008 through 2011, so long as all of the conditions set forth below are met:*

- a. *The estimated 60-20-20 Index (using 50% exceedence) for the then current water year based on the California Department of Water Resources within-month March runoff forecast update following March 15 is at least 4.2, provided that (1) daily computed natural flows for both the Tuolumne and San Joaquin River in excess of 50,000 cfs are excluded and (2) the Tuolumne River comprises at least 31% of the index.*
- b. *The 60-20-20 Index for the immediately preceding water year was at least 4.2.*
- c. *The target flow shall be subject to any flow and/or timing limitation required by the VAMP study.*
- d. *The target flow shall be subject to any flow and/or timing limitation required by the Corps of Engineers.*"

Service Comment: This study should be conducted during the first year that the 60-20-20 Index exceeds 3.0 and no later than 2014. It is extremely unlikely that there will be two consecutive wet years by 2011 as proposed by the Districts.

Commission Staff Conclusion: "*Staff concludes that the RST procedures must be modified if meaningful results are to be obtained.*"

Districts' Response: "*The Study Plan revision states "Current RST protocols may be modified following TRTAC review and discussion of the Agency concerns regarding efficiency tests and availability of test fish" and the same statement is added to the RST elements of Sections III and V of the Study Plan. However, the concerns expressed regarding past deficiencies are not entirely evident to us.*"

Service Comment: We support the Commission staff conclusion that the RST procedures must be modified to ensure meaningful results. During 2005 and 2006, when the Districts operated the rotary screw traps, the capture efficiency tests were inadequate. First, the Grayson trap was moved in 2006 and no sampling occurred between April 12 and April 21, which is within the peak of the smolt outmigration period. If possible, it would be better to select a site that functions at all flows and the traps should be set in the same position every year. If necessary, flow deflection panels should be used to improve efficiencies at low flows. Second, an entire set of efficiency tests are needed at each trap location, if the traps are moved to new locations. Finally, when capture efficiencies are below 1%, which typically occurs during high flow conditions, at least five replicates are needed for each flow and each size of fish (fry, parr, and smolt). The Districts must endeavor to ensure that adequate numbers of study fish are available for the trap efficiency tests.

Commission Staff Conclusion: "*The proposed acoustic tracking study to assess response to flow is part of the same tracking study being used to assess predation on smolts (see below) and will*

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provide useful information to flow-related studies as well as the predation study. Staff's concern with the telemetry study is whether researchers will be able to tell the difference between a smolt with an implanted transmitter and a predator with a transmitted smolt in its stomach."

Districts' Response: "*Ongoing tracking studies in the San Joaquin basin and Delta have shown movement patterns differ for predator fish, usually remaining in a home range or moving both upstream and downstream, whereas smolts tend to move downstream. The acoustic tags in these studies also provide a unique identification for each tagged smolt or predator fish.*"

Service Comment: The Service supports the acoustic tag studies and agrees with the Districts that it should be possible to reasonably discern a live smolt from a predator with a tagged smolt in its stomach. However, the Service recommends extending such studies beyond the three years proposed, increasing the number of study fish to at least 100, and increasing the number of stationary receivers to at least 9 to obtain meaningful information. For example, these studies should be conducted during at least two dry years, two normal years, and two wet years to fully evaluate sources of mortality relative to flow. Studies should be conducted throughout the season, including releases in early April, mid-May, and early June. Receivers should be placed immediately upstream and downstream from several different potential sources of mortality, such as a large mine pit with predators, agricultural return flows, and runoff from the City of Modesto, as well as at the river's mouth. It would also be useful to place receivers at the upstream and downstream boundaries of restoration sites. Since there appear to be numerous sources of mortality in the Tuolumne River, each group of tagged study fish should total at least 100 individuals so the relative importance of the mortality sources can be accurately determined.

Habitat Restoration

Commission Staff Conclusion: "*The Districts need to clarify their intentions with regard to completing the remaining restoration projects.*"

Districts' Response: "*As stated in prior filings with the Commission, the completion of additional projects of the magnitude selected by the TRTAC will require state and federal funds.*"

Service Comment: We recommend that the Districts should provide assurances that key restoration projects will be implemented. The basis of the 1995 FERC Settlement Agreement was that the Districts would implement habitat restoration projects to help mitigate for project effects to the salmon population in lieu of releasing higher flows. If the Districts do not commit to implementation of the remaining restoration projects, then a greater emphasis should be placed on improved flows to protect the salmon population. If the Districts intend to rely on habitat restoration to improve conditions for the salmon population, then they should be responsible for evaluating the effectiveness of their restoration projects. In addition, the Service does not expect the Districts to provide mitigation for past mining practices, but does expect the Districts to adequately address all issues related to project operations.

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Fry Survival

Commission Staff Conclusion: "*The Districts need to modify their study plan and techniques to ensure that they produce useful and defensible data from the RST study. The otolith analysis should provide valuable data on freshwater residency. The otolith analysis should provide valuable data on freshwater residency. With regard to the Agencies' four proposed studies, numbers 1, 2, and 4 are being addressed in the Districts' current plan. As for item 3, staff believes that bioassay studies are not justified at this time until there is evidence that compromised health contributes to reduced survival. The Districts and Agencies disagree on whether high winter flows results in movement of fry that is beneficial to their survival and ultimately adult production. They should agree prior to the completion of these studies how the study results will be analyzed to address this question to minimize future disagreements in the interpretation of results.*"

Districts' Response: The Districts responded only to the issue on whether high winter flows results in movement of fry. "*Because the stated hypotheses regarding winter pulse flows were related to fry movement out of the gravel bedded reach, we interpret this comment to pertain to the relationship of "fry" movement and winter flow. Fry movement will be assessed by daily trap counts at both RST sites as well as biweekly seining surveys. The analysis of otoliths may provide information regarding periods of freshwater and estuarine residency as well as the contribution of fry production to subsequent adult returns. The Study Plan revision states: "The use and scheduling of winter pulse flows and additional study details, including data interpretation, will be discussed at the TRTAC meetings as needed."*"

Service Comment: The Service continues to disagree with the Districts regarding the ecological function of high winter flows. We believe that high winter flows inundate floodplain habitats that provide food and refuge from predators (among other benefits) and thereby result in high rates of fry survival within the Tuolumne River. Studies of the effects of high winter flows on fry survival are needed to help ascertain the mechanisms acting in this relationship. The study should include an experimental flow schedule that compares high flows that inundate floodplains for several weeks during February and March compared to the normal base flow releases during February and March. The study metric would be the estimated number of juveniles produced at the Waterford rotary screw trap site that survived to a smolt-outmigrant size as estimated with the Grayson rotary screw trap site.

The Service agrees that the Districts' proposal to conduct a micro-chemical analysis of otoliths will help resolve the issue of whether migrant fry survive at low rates compared to fry that rear within the Tuolumne River. The Service recommends the Districts select a researcher with background and experience in this field to conduct the micro-chemical analyses.

The Districts' plan should include bioassay studies to monitor fry health (e.g., feeding, disease, and contaminants) in various reaches of the river. These juvenile fish health studies should be implemented because the project operations affect water flows and water temperatures, which affect food requirements, food production, disease, and contaminant impacts. Columnaris disease, which is caused by the bacterium *Flexibacter*

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columnaris, was observed in juvenile Chinook salmon caught in rotary screw traps in the Stanislaus River in spring 2007; whereas juvenile salmon in the Tuolumne and Merced rivers may have been diseased but were not evaluated in 2007. Along with the protozoan *Ichthyophthirius multifiliis*, *columnaris* was a leading cause of the 2002 adult salmon kill in the lower Klamath river. *Renibacterium salmoninarum*, the causative agent of Bacterial Kidney Disease (BKD), has been detected in naturally produced juveniles caught in the Tuolumne River in 2001 by the Service's California-Nevada Fish Health Center, Anderson, California. Although no gross clinical signs of BKD were observed, low-level infections might become lethal as water temperatures increase to suboptimal levels due to flow reductions and water diversions. Another benefit of the juvenile fish health studies is an assessment of lipid reserves in the muscle tissues of fry, parr, and smolts, which provides an index of food resources and growth conditions, which would help evaluate the potential mechanism by which floodplain inundation and/or water temperatures affect fry survival.

By implementing both the micro-chemical analysis of otoliths and the fish health studies, it will be possible to evaluate the competing hypotheses of the Districts and the Service. It is anticipated that the data will be adequate to reject one hypothesis and accept the other. If only the otolith studies are conducted without the fish health studies, we will know whether fry survival in the Tuolumne River is important compared to Delta survival, but we will not fully understand whether project operations affect fry survival. For example, if fry survival is primarily dependent on food resources and refuge from native predators, and food resources and predator refuge are dependent on floodplain inundation, then fry survival would be directly affected by project operations. However, if fry survival is primarily dependent on predation by exotic fish predators in captured mine pits, then fry survival is mostly affected by other non-project factors. Resolving the issues of fry survival to the satisfaction of both the Service and the Districts depends on the implementation of a host of study elements including: fish health studies (food resources), direct predation studies, well calibrated rotary screw trap monitoring at Waterford and Grayson, and the micro-chemical otolith analyses.

Steelhead Presence/Protection

Commission Staff Conclusion: "..., the Districts' plan addresses most of the items we identified to be a meaningful analysis of the status of *O. mykiss* in the system. If these studies document the presence of a steelhead trout population in the Tuolumne River, further analysis should be defined to determine what protective measures (e.g., flows, temperature, habitat, passage, etc.) are needed."

Districts' Response: The Districts only agreed to review pertinent steelhead data from nearby rivers as a means of informing the development of potential restoration and management actions in the future.

Service Comment: To document the presence of steelhead trout in the Tuolumne River, it will be necessary to sample adult trout that migrate upstream into the river during winter and spring. The Districts propose to conduct two hook-and-line surveys during the spring. The Service recommends that surveys should be conducted until at least

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50 otoliths have been collected from trout in the Tuolumne River that have characteristics that are typical of steelhead (e.g., the size and coloration of the eleven fish observed at the Stanislaus River weir in 2007).

Predator Control

Commission Staff Conclusion: "*The Districts' plan provides a variety of studies that adequately address the needs identified by staff. The Districts' response to Agency comments also addresses most of their concerns. See concerns about telemetry study above in discussion on Instream Flow study plan.*"

Districts' Response: "*Ongoing tracking studies in the San Joaquin basin and Delta have shown movement patterns differ for predator fish, usually remaining in a home range or moving both upstream and downstream, whereas smolts tend to move downstream. The acoustic tags in these studies also provide a unique identification for each tagged smolt or predator fish.*"

Service Comment: The Districts' Study Plan does not address most of our concerns about predation. To reiterate: The Districts propose to study predation under low (~400 cfs) and high (> 2,500 cfs) flows under the existing flow schedule in a study period limited to no more than 10 days. We recommend that the studies should be conducted for a sufficiently long period to both detect the response of the fish (e.g., variations in migration rates and predation rates) and evaluate the full range of environmental conditions (e.g., fluctuations in water temperature and turbidity).

The Districts' Plan includes direct predator sampling during the winter and spring with boat electrofishing or angling. However, their plan does not specify the habitat types that will be sampled. We recommend sampling a wide variety of habitats including special run pools, glides, pools, and captured mine pits to ensure that striped bass, Sacramento pikeminnow, and black bass are adequately sampled. The Districts' Plan should include additional sampling methods, such as gill nets, to capture striped bass and Sacramento pikeminnow. Seining is unlikely to be an effective method for capturing predators.

The Districts' Plan includes the use of acoustic tags to quantify smolt predation rates but proposes to tag too few fish and only use three stationary receivers. It is unlikely that this study design will adequately evaluate potential predators in their various habitats. Please see our specific recommendations on page 5.

River Temperature

Commission Staff Conclusion: The Agencies recommended five additional studies: 1) screw trap studies to see how flow and temperature affect smolt survival and production; 2) escapement and age analysis to see how flow and temperature affect adult recruitment; 3) smolt telemetry studies; 4) bioassay studies to relate fish condition to flow and temperature; and 5) inclusion of flow and temperature in predation studies. "*Of the additional studies recommended by the Agencies, numbers 1, 3, and 5 are mostly just additional analyses on existing tasks to include consideration of flow and temperature effects; these should be included and the Districts' concur*

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in their response to the Agencies' comments. With regard to item 2, staff is not convinced that the proposed analysis would be very production. As stated above, bioassay studies are not justified until there is some evidence that poor health in the river is a real factor in juvenile survival."

Districts' Response: None was provided.

Service Comment: The Service recommends continuing the trend analyses of adult recruitment (number 2), because adult recruitment is a direct measure of the goal to improve adult production and because the data base of adult recruitment is relatively long-term compared to juvenile survival studies.

The Districts' Plan calls for the use of acoustic tag studies to determine how flow and temperature affect smolt survival. While we support acoustic tag studies, we recommend extending such studies beyond the three years proposed and suggest that increasing the number of study fish and receivers will be required to obtain meaningful information.

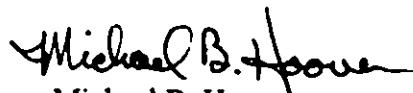
As recommended for the fry survival studies, the Districts' plan should include the monitoring of fry health through bioassay studies (number 4) (e.g., feeding, disease, and contaminants) in various reaches of the river. These studies are justified for three reasons:

1. adult recruitment in the Tuolumne River has declined by about 50% since 1995 for unknown reasons;
2. bioassay studies provide a low-cost method for assessing food resources and overall health and growth conditions for juvenile salmon; and
3. fish diseases were documented in the Tuolumne River in 2001 and in San Joaquin Basin in 2007.

CONCLUSION

Thank you for considering these comments. Please contact Kim Webb (Service) at 209.946.6400 extension 311 with any questions regarding this matter. The Service looks forward to working with Commission staff, California Department of Fish and Game, National Marine Fisheries Service, the Districts, and the Conservation Groups to develop a robust study plan which will provide adequate data on which to base a minimum flow schedule and other non-flow mitigation measures adequate to maintain and protect Tuolumne River fisheries.

Sincerely,


Michael B. Hoover
Acting Field Supervisor

PROOF OF SERVICE

Federal Energy Regulatory Commission

Project No.: FERC #2299, Don Pedro Dam Hydroelectric Project

I hereby certify that I have this day served by regular mail, the foregoing letter, Subject: U.S. Fish and Wildlife Service and National Marine Fisheries Service Comments on the Commission Staff's Preliminary Analysis of the Tuolumne River Fisheries Study Plan for the New Don Pedro Hydroelectric Project (FERC No. P-2299-060) to each person designated on the official FERC Service list.

Dated at Sacramento Fish and Wildlife Office, Sacramento, CA this 27th of July, 2007.

Sharon Douglas

Sharon Douglas
Office Assistant
US Fish and Wildlife Service
2800 Cottage Way, Rm. W-2605
Sacramento, CA 95825
(916) 414-6600