August 23, 2005

Magalie R. Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Don Pedro Project - FERC No. 2299
Response to Comments on 2005 Ten Year Summary Report

Dear Secretary Salas:

Pursuant to the Commission's Notice of June 24, 2005, Turlock Irrigation District and Modesto Irrigation District ("Licensees") hereby submit their responses to the comments filed on the Licensees' 2005 Ten Year Summary Report ("Report") which they submitted to the Commission in March 2005 pursuant to Paragraph (G) of the 1996 FERC Order issued July 31, 1996[1].

INTRODUCTION

The Licensees believe the comments were, with a few exceptions, generally constructive and supportive of the continuation of the implementation of the 1995 FERC Settlement Agreement ("FSA"),[2] at least through the term of the Licensees' current license for the Don Pedro Project.

As noted in the responses that follow, the Licensees have met with the participants on the Tuolumne River Technical Advisory Committee ("TRTAC") to discuss the Report and additional meetings can be scheduled as needed. At this time, the Licensees do not believe there is a need for either a hearing or a formal technical

[1] *Turlock and Modesto Irrigation Districts*, 76 FERC ¶ 61,117.
[2] Licensees will use the acronyms and abbreviations set forth in the Report, pp. xvii to xix.

conference on the Report. The Licensees would also note that the NMFS has been participating in the meetings of the TRTAC for several years and the Licensees are willing to consider formalizing the participation of that agency under the FSA.

The Licensees would offer the following responses to the comments by the resource agencies and other interested participants on the Report. The responses are not intended to be a comprehensive treatment of the comments received.

I. TIMING OF THE REPORT

Several of the commenters indicated that they did not believe they were given sufficient time to review the Ten Year Report and to prepare comments in response to the Commission's notice. Some asked the Commission for additional time to file supplemental comments. The Licensees have no position on such requests, but would note that there has to date been considerable time afforded to review the Report.

The FERC sent out an e-Subscription notice on March 25, 2005, that the Report was available for viewing. On April 4, 2005, Licensees sent an email to all persons on the TRTAC email distribution list announcing that the Report was available on the FERC website. Copies of the Report were hand-delivered to the Friends of the Tuolumne ("FOT") and Tuolumne River Preservation Trust ("TRPT") by April 19, 2005, and to the CDFG LaGrange office staff on April 20, 2005. Copies of the Report were sent out by Federal Express to USFWS (Sacramento and Stockton offices), NMFS, CCSF, and FERC Regional staff by April 28, 2005.

The Licensees in their May 19, 2005 filing with FERC stated that they intended to make a presentation on the Report at the scheduled June 22, 2005 TRTAC meeting. In response, several participants wanted all TRTAC members to be present instead of holding more than one meeting to discuss the Report, which the Licensees were willing to do. Some participants suggested postponing the meeting until August. By consensus via email, it was agreed to hold the meeting on July 13, 2005, and a meeting announcement was emailed to the TRTAC email list on June 9, 2005. A lengthy presentation and discussion of the Report took place at that meeting. The Licensees are prepared to continue those discussions at the next regularly scheduled TRTAC meeting on September 21, 2005 and in subsequent meetings agreed upon by the TRTAC. The Licensees do not believe that a formal technical conference, as suggested by some, is necessary.

II. OPERATION OF THE TRTAC

Several commenters suggested that consideration should be given to restructuring the TRTAC established under the FSA to reduce the role of the Licensees. Some even suggested doing away with the consensus voting system agreed upon in the FSA in favor of a voting arrangement in which the resource agencies would have the majority of the votes. These criticisms are new and have not, to the Licensees' knowledge, been previously communicated in writing to this Commission and certainly not to the Licensees. Moreover, the Licensees object to any proposal that would allow the resource agencies to dictate the decisions of the TRTAC.

These recently voiced criticisms about the functioning of the TRTAC should be viewed within the context of how the TRTAC and its predecessor have functioned over the past nineteen years. Those criticisms must be weighed against the TRTAC's success over the many years and those commenters' participation over that period without any significant complaints about how the TRTAC functioned. All major issues confronting the TRTAC have been decided through a collaborative process by consensus among the participants. At any given time, not all participants may have been happy with the collaborative process or with the decisions reached but at the time of the decision they agreed that they could live with the decision.

The 1986 Amended Fish Study Agreement among the Licensees, USFWS, and CDFG established a "Technical Committee" of those parties. The 1986 Agreement was approved by FERC on February 2, 1987 (38 FERC ¶ 61,097). The Technical Committee started meeting in 1987 and functioned until it was replaced by the FSA's TRTAC. That Technical Committee functioned well because everyone recognized the need to modify flow schedules and study plans to meet changing circumstances (adaptive management) and the need to make those modifications within the well-defined flow and funding parameters specified in the 1986 Agreement. A good working relationship developed among the representatives for the Licensees, CDFG, and USFWS that allowed for adaptive management in the allocation of instream flows and in design, coordination, and funding of fish studies and monitoring activities. That same cooperative spirit carried over to the functioning of the TRTAC, which held its first meeting on December 18, 1995. .

For the FSA, the signatories opted for a two-tier governance structure:

Tier #1 – The TRTAC, which is open to all persons and organizations who have an interest in lower Tuolumne River fish issues and whose representative is "a technical specialist in the aquatic sciences." (FSA, § 14, p. 12.) The TRTAC participants do not need to be signatories to the FSA. In addition, any FSA party can send non-technical representatives to audit TRTAC meetings.

Tier #2 – The Management Committee, which is limited to representatives of the Licensees, CDFG, USFWS, and CCSF. The Management Committee is responsible for resolving all issues elevated to it by the TRTAC and decisions are to be made by consensus. (FSA, § 14, p. 12.)

The TRTAC has readily accommodated new participants. For example, the NMFS Sacramento staff began attending TRTAC meetings in 1999 and the California Rivers Restoration Fund ("CRRF") began attending in 2003. The TRTAC meets at least quarterly, which allows for maintenance of lines of communication among the TRTAC participants. The TRTAC has conducted extended and additional meetings, formed a Monitoring Subgroup, and conducted telephone conference calls and workshops as needed to work through major or controversial issues. Proposed meeting agendas are typically emailed out to the TRTAC email list for review and comment prior to each quarterly meeting. Specific topics are included in every agenda.

The ultimate test of the success or value of a collaborative process is the ability to resolve disputes or major issues through consensus over a long period of time. For nearly ten years, the TRTAC has strived to resolve all issues by consensus within the TRTAC and it is an impressive accomplishment that no issue to date has been elevated to the Management Committee for resolution. It is instructive to examine how the TRTAC has handled certain major issues under the FSA.

a. Development of the Habitat Restoration Plan (HRP) and selection of priority restoration projects under FSA §12 – The TRTAC habitat restoration planning began in earnest in 1996 with the start of "watershed analysis" and restoration scoping. A decision to proceed with development of the HRP was made. The January 1997 flood led to a suddenly altered river habitat condition to which the TRTAC then focused on addressing some of those impacts in the plan. The first project proposals for outside funding were completed in 1997. A summary brochure of the HRP was produced in 1999 and the plan itself was finalized in 2000. Six of the ten priority projects were selected by consensus by the TRTAC in 1999 with the remainder selected in 2000.

b. Development of Habitat Restoration Project Proposals – The TRTAC participants have been intimately involved in the development and review of grant funding proposals for habitat restoration projects and project monitoring. Those proposals have been submitted for grant funding by the Licensees on behalf of the TRTAC. The involvement and endorsement of TRTAC participants have been critical in obtaining the necessary funding.

c. Decisions on Monitoring Tasks – The TRTAC has reached many decisions by consensus to adaptively manage and modify FSA § 13 monitoring tasks, as summarized in Report Tables 3.5.-1 and 3.5-2. The use of a Monitoring Subgroup was employed extensively at times to assist in this process. An example is the smolt survival evaluations where (1) the field studies for three years incorporated additional screw trap sites and test fish releases, (2) a peer review workshop was held, and (3) agreement was reached to conclude the field studies and perform extensive review and analyses to evaluate and interpret monitoring data and results.

d. *O. mykiss* studies – Monitoring activities, in addition to the existing FSA monitoring that focus on *O. mykiss*, have been discussed at TRTAC and Monitoring Subgroup meetings. Those discussions led to the Licensees agreeing to the following additional monitoring activities: (1) additional thermographs in the upper river reach; (2) additional summer snorkeling; (3) a water quality survey in the upper reach; and (4) a winter/spring float survey with CDFG in 2004.

e. Flow schedule determinations – The TRTAC has input on proposed flow schedule modifications by the Licensees, CDFG, and USFWS under FERC License Article 37 as amended by the 1996 Order. These have included (1) decisions on the allocation of seasonal positive and negative true-up adjustments in drier years; (2) decisions on the allocation, timing, and pattern of spring and fall pulse flows; and (3) the setting of a variable flow schedule for the summer of 2003.

The above examples illustrate how the adaptive management process functions and has been implemented within the existing FSA TRTAC structure.

III. THE DELTA'S IMPACT ON SAN JOAQUIN BASIN SALMON

A number of comments on the Report focused upon short-term escapement trends to justify increasing minimum instream flows above the 1995 FSA levels while ignoring or questioning the relevance of Delta conditions in recent years. Delta

conditions represent a major life-history bottleneck for San Joaquin Basin Chinook salmon and a thorough evaluation of those Delta mortality factors is needed to establish reasonable expectations for the potential to address and mitigate these Delta factors by upstream measures alone. Under Section 10 of the FSA, the Licensees are not required to mitigate for outside factors adversely affecting achievement of the Section 9 goals, including, but not limited to, Delta export operations.

In their annual reports to the Commission, the Licensees' have provided regular updates of salvage and loss estimates at the Delta export facilities and results of south Delta smolt survival evaluations. Below, the Licensees provide additional information regarding the influence of these outside factors on attainment of the FSA goals.

A. San Joaquin Basin Flow in the Delta

The CVP and SWP facilities export very large volumes of water, with daily flows often larger than the discharge of the entire San Joaquin River (See Report Figure 4.4.1.1-3, p. 4-23). As discussed in the Report, reductions of Delta exports below 4,000 cfs since the year 2000 have been limited to the spring Vernalis Adaptive Management Program ("VAMP") April 15 to May 15 period and the post-VAMP period. Moreover, during spring outmigration of Chinook salmon (April-May), the exported water is comprised almost entirely of water originating in the San Joaquin Basin because of the geography and geometry of the San Joaquin Basin in relationship to the Delta and as confirmed by hydrodynamic modeling and analysis of conservative water quality constituents (See attached Figure A).

A number of measures intended to reduce the vulnerability of smolts to export-related mortality have been implemented in the Delta (e.g. salvage operations, VAMP). However, export levels have risen quite consistently in the past decades and although the April 15–May 15 export levels have been reduced under VAMP, those have been accompanied by even higher export rates at other times of the year (See attached Figure B). Moreover, there are good reasons to suspect that the so-called "direct effects" of export, that is, the entrainment of smolts into Clifton Court Forebay and the CVP intake channel, are dwarfed by "indirect effects", arising from the dramatic effects of export operations on South Delta hydrology. Although several studies of reverse

flows in the Delta and their effects on smolt outmigration have been implemented in recent years[3], the significance of these effects is only beginning to be understood.

B. Smolt mortality in the interior South Delta.

It is well known that the survival of smolts migrating through the interior South Delta (i.e., through Old and Middle Rivers) is much poorer than the survival of smolts migrating through the Lower San Joaquin River (past Stockton). For example, smolt survival study releases into the Upper Old River versus the Lower San Joaquin River releases suggest relative survival of outmigrants traveling through Upper Old River are about 50% of those traveling through the Lower San Joaquin River. Furthermore, fish arriving at the CVP and SWP Delta export facilities are "salvaged" for relocation to release locations at Sherman Island inland of the Chipps Island trawls. That is, some of the fish recovered at Chipps Island could have arrived "by public transportation," rather than their own efforts. To identify the survival of smolts actually migrating through Old and Middle Rivers, salvage re-release numbers must be taken into account.

Simple calculations show that, for many San Joaquin release groups, the number of smolts estimated to have been recovered alive at the fish salvage facilities is comparable in magnitude to the total number of smolts estimated to have reached Chipps Island. That is, outside of the VAMP period, smolt survival in the interior South Delta may be effectively zero, under typical inflow and export conditions. Even within the VAMP period, the combined differential recovery rate estimates for tagged salmon released at Mossdale and Durham Ferry in relation to those released at Jersey Point suggests extremely low in-Delta survival in recent years (2–3% in 2003–2004 vs. 15–19% in 2000–2002) even with smolt protection measures in place (e.g. HORB, reduced exports).

IV. SAN JOAQUIN BASIN CHINOOK SALMON POPULATION DYNAMICS

The concern raised by several commenters that Tuolumne River salmon runs are presently lower than runs in the Stanislaus and Merced rivers[4] must be analyzed within the context of a longer time period and the specific differences among the three San Joaquin Basin tributaries. Tuolumne runs are not often the highest run of the basin in a

[3] Vogel, D. 2005. The Effect of Delta Hydrodynamic Conditions on San Joaquin River Juvenile Salmon. Report, by Natural Resource Scientists, Inc. Red Bluff, CA. May. http://www.waterrights.ca.gov/baydelta/docs/exhibits/SJRG-EXH-25.pdf

[4] NHI p. 4 ¶ 2; FOT p. 4 ¶ 2; NMFS p. 7 ¶ 3

given year (e.g. only in about six of the last 20 years). All San Joaquin Basin tributary runs (Stanislaus, Tuolumne, and Merced) continue to exhibit a similar overall long-term trend of varying high and low escapements following meteorological conditions, which are not synchronous with Sacramento Basin escapements. This suggests that the primary mortality factors are acting similarly on all three San Joaquin Basin tributaries, despite the significant contribution to Merced River escapements by CDFG's Merced River Fish Facility. Further examination of specific differences among the tributaries is needed, including (1) outmigrant timing and production, (2) hatchery component, and (3) age composition. The Licensees agree that detailed cohort assessment would be a good comparative approach. The Licensees suggest that a detailed comparison of data among the tributaries and Delta conditions may help further identify sources of differences.

A. Relationships between Flow and Tuolumne River Populations,

In their comments on the Report, CDFG[5] and USFWS[6] present analyses of flows and production to argue that the current flow regime under the FSA has either resulted in reduced Chinook salmon populations, or has produced no demonstrable benefits. The CDFG analysis presented in its comments on the Report repeats many assertions regarding the relationship between flow and subsequent production that CDFG provided as part of the recent State Water Resources Control Board's Bay Delta Water Quality Control Plan Periodic Review proceedings.[7] A critique provided by S.P. Cramer and Associates[8] found that the CDFG analyses should be considered highly speculative due to methodological inconsistencies. That is, conclusions that flow augmentation outside of the VAMP period (i.e., when Delta exports are curtailed) will result in large increases in escapement cannot be substantiated from the CDFG information presented.

In the USFWS analysis, the inferred recruitment as a function of annual flows in the San Joaquin basin is compared for the periods from 1980–1995 and 1997–2002. The USFWS acknowledge that the regressions are not significantly different on the basis of model fit. For this reason, the Licensees cannot agree with the conclusion that "the population declined during the post-FSA period compared to the pre-FSA period." In their comments, the USFWS acknowledges that although there are potentially more

[5] CDFG Comments p. 7
[6] USFWS Comments, Enclosure 1
[7] http://www.waterrights.ca.gov/baydelta/exhibits_list.htm#cdfg
[8] S.P. Cramer Associates. 2005. Memorandum, Preliminary Review of Statistical Analysis Presented in "Issue 8. River Flows San Joaquin River at Airport Way Bridge. Comments of the California Department of Fish and Game (5/27/05), at http://www.waterrights.ca.gov/baydelta/docs/exhibits/SJRG-EXH-28.pdf.

spawners due to reduced harvest and improved FSA flow conditions in drier years, there are many other factors that can affect Tuolumne River salmon populations outside the control of the Licensees.[9]

B. Use of Population Models

Several commenters on the Report questioned the validity of existing population models as a means of assessing achievement of the comparative population goals under Section 9 of the FSA.[10] The commenters do concede that the five years of available recent escapement data (i.e., 1999–2004 escapements, which are primarily progeny of 1996-2001 production) are insufficient to evaluate the effectiveness of increased flows since the 1996 FERC order[11]. Given the large uncertainty associated with statistical comparisons made from the five years of escapement data available, the Report provides modeling results to show the effectiveness of the current flow schedule as compared to pre-FSA flow requirements.

In an effort to understand the management implications of the behavior of the fluctuating population of the Tuolumne River and the San Joaquin River basin as a whole, the Licensees developed two models to examine the time-series of historical escapements to the San Joaquin basin in relation to river flow, Delta exports and other factors. Like the Oak Ridge Chinook Salmon model[12], the EACH model (TID/MID 1991 Appendix 1) is a deterministic simulation model that incorporates mechanistic relationships affecting life-stage specific survival as well as multi-generational population dynamics. Although these types of models are well suited for examining the implication of alternative management actions (e.g., changes in flow schedules, spawning area, gravel quality, export flow, etc.), deterministic models lack the statistical framework for the development of confidence intervals around the resulting predictions.

Using a State Space Modeling ("SSM") approach recently recommended in a review of USFWS assessment methodologies for the CVPIA[13], the Licensees' Stock Recruit model (TID/MID 1992, 1997, Report 96-5) uses a simpler parameterization of the factors assumed to control production (i.e. basin flow, parent stock size and fitted

[9] USFWS Enclosure 1,
[10] CDFG p. 7, ¶ 3; NMFS p. 5, ¶ 2; USFWS p. 12, ¶. 2.
[11] CDFG p. 13, ¶ 1; NMFS p. 5, ¶ 1.
[12] Jager, H.I. and K.A. Rose. 2003. Designing optimal flow patterns for Chinook salmon in a Central Valley river. North American Journal of Fisheries Management 23(1):1-21.
[13] Newman, K.B., and D.G. Hankin. 2004. Statistical procedures for detecting the CVPIA natural Chinook salmon production doubling goal and determining sustainability of production increases. Prepared for the U.S. Fish and Wildlife Service AFRP under subcontract to CH2M-Hill, Sacramento, CA. June 21. http://www.delta.dfg.ca.gov/afrp/SWRCB/I.Newman_Hankin_Paper1.pdf

life stage parameters) than simulation models. SSMs can explicitly incorporate measurement error in annual escapement estimates and harvest rates, a major limitation of regression and simulation model approaches. SSMs also incorporate temporal dependence of escapements in adjacent years (i.e. auto-correlation) due to mixed age classes arising in different year types. In model runs that either include or exclude year-by-year corrections for actual observed escapement, the Stock Recruit model fits the observed escapements very well. In simulations using the entire period of record hydrology since the completion of the New Don Pedro Dam (1971-2004), the results presented in the Report show that increased spring flows under the current flow schedule would have resulted in a 37% increase in average escapement.

In addition to illustrating the benefits of the increased flows under the current flow schedule discussed in the Report, the Stock Recruit Model results show that high flows throughout the San Joaquin Basin from USACE-mandated flood management releases in wetter water years can be used to explain the largest population increases in the escapement time series. However, even if wet year hydrology occurred regularly in the Tuolumne River sub-basin to provide this excess water, it is clear that corresponding flow increases in other sub-basins or significant reductions in Delta export rates would have to be provided to realize the projected population benefits suggested by the USFWS and CDFG analyses.

V. WITHIN TUOLUMNE RIVER CONDITIONS

A. Tuolumne River Habitat Restoration Program

Several commenters questioned the likelihood of further implementation of the currently funded and yet to be funded habitat restoration projects because of concerns about gravel availability, continuation of outside funding, and anticipated project benefits.[14] The Licensees agree that the TRTAC should continue to review the status of the priority projects as may be necessary due to changes in outside funding, evaluation of project benefits, monitoring results, landowner issues, and other factors that affect the feasibility of implementing any of the projects.

The Report described the restoration program and projects pursued by the TRTAC through 2004. The initial river inventory and resulting Habitat Restoration Plan (HRP) by consultants McBain and Trush identified many potential areas of habitat

[14] NMFS p. 6 ¶ 2; FOT p. 3. ¶ 1; CRRF p. 18-19.

improvements in the 52 miles of the lower Tuolumne River. The TRTAC chose to focus on projects within the gravel-bedded (upper) half of the river. The TRTAC also selected the ten priority projects with the clear understanding that large amounts of outside funding would be needed to accomplish most of those ambitious projects.

As detailed in the Report Section 3.3, thus far, the HRP has been developed, two major projects costing over $10 million have been completed, and important preliminary work on several other projects has been completed. Both of the completed projects also address the extensive aggregate mining impacts to the river. State and Federal funding commitments of over $22 million have been received for three additional TRTAC projects. The Licensees have made good faith efforts to accomplish the projects as identified by the TRTAC and the Licensees and CCSF have completely met their financial obligations under the 1996 FERC Order and the FSA - these accomplishments far exceed what was envisioned in the FSA. The Licensees sought and were successful in maximizing the leverage of the $1 million in FSA funding provided by them and CCSF. Suggestions by certain commenters that the Licensees and CCSF be required to provide any shortfall in outside funding, which could potentially be tens of millions of dollars should cut backs in Federal and State funding occur, would penalize the Licensees and CCSF for seeking to obtain the maximum benefit for the Tuolumne River and would certainly act as a disincentive for them to exert such efforts in the future.

The Licensees and the TRTAC-approved HRP both recognize the lack of recruitment of spawning gravel as well as the cumulative massive loss of gravel associated with gold and aggregate mining activities. Recent gravel additions in the La Grange area made by CDFG have been criticized by some parties for possible effects to *O. mykiss* habitat and for a general lack of suitability (referred to by DOI as abnormally porous gravel over marginally suitable habitat). The completed TRTAC 7-11 Project enhanced gravel conditions in a former mining reach which is now primarily used by salmon. The revised Coarse Sediment Management Plan (submitted as part of our 2004 Annual Report to FERC) specifically incorporated aspects of project design for both salmon and *O. mykiss* in the river upstream of Roberts Ferry Bridge. Pending TRTAC gravel addition projects within that upper reach, which are intended to address both the lack of gravel recruitment and to further recover from spawnable area losses incurred in the 1997 Flood, are presently held up in the CALFED process for the 2005 season. The Licensees agree that upstream gravel additions may contribute to reducing the salmon redd superimposition and improve habitat conditions for *O. mykiss*.

The 1997 Flood. The suggestions by NMFS (p. 1, § I.B) and FOT (p. 2, ¶ 4) that the impacts of the 1997 Flood was caused by mismanagement of the Licensees was soundly refuted by court decisions in lawsuits filed against the Licensees over the 1997 Flood. The flood litigation cases were consolidated in the Superior Court of California, County of San Joaquin. In an October 8, 2003 decision, the San Joaquin County Superior Court granted Licensees' motion for summary judgment dismissing the main flood litigation case because the plaintiffs failed to show that Licensees' negligence, if any, caused the flooding. The Court found that the substantial factor in causing the flood was the unexpected "Pineapple Express" storm events and not the encroachment of the 340,000 acre-feet Don Pedro Project flood reservation. Much of the damage in the Tuolumne River resulting from the flood related directly to past and ongoing mining activity and other habitat-modifying encroachments to the river and floodplain.

B. Development of FSA Monitoring/Studies Program and Subsequent Changes to the Program.

Comments by the NMFS (p. 5, ¶2) state that the "Districts have not implemented the appropriate monitoring studies to measure the response of the Chinook salmon population to FSA flow and non-flow action." The monitoring and studies program (FSA, pp. 9-11) were drafted and proposed by CDFG. Various participants, including the Licensees, had concerns with CDFG's program, but they agreed with the proposed program with the inclusion of provision "h" in Section 13, which states, "The TAC is authorized to modify the monitoring activities and studies specified in Section 13 (including, but not limited to, changes in the scope, protocols, number of years, and funding limits for an activity or study) so long as the total funding limit for monitoring [i.e., $1,355,000] is not exceeded." As required by the above quoted provision, all changes to the monitoring/studies program under the FSA have been subject to the review and consensus approval of the TRTAC. No changes have been unilaterally made by the Licensees. The table comparing the original FSA study categories and studies under each category as actually implemented is set forth in Report Table 3.5-1, page 3-52.

C. Licensees' Responses to Specific Monitoring Comments Submitted to FERC.

Several comments expressed concerns about various monitoring elements of the FSA program – some of those are addressed in more detail below.

Variations in Spawning Escapement Estimates.

CDFG states that "the Report contains escapement estimates that are different from those reported by the Department (who completes the surveys)… and provides no rationale for why escapement estimates were changed nor does the Report describe the method used to develop the new estimates."[15] The Licensees include in each annual report to FERC a Spawning Survey Summary Update, which contain the Licensees' escapement tabulations. Licensees have always strived to use the best scientific data available. However, CDFG often generates several different spawning escapement estimates at different times for any given run year and at times these estimates are significantly different. For example, CDFG may provide estimates from preliminary data or verbal reports, published CDFG Sportfish reports for the basin and CDFG Central Valley escapement reports, and the CDFG "Grandtab" files, for which the Licensees may not possess the CDFG's latest update. Consequently, it can be difficult to know what CDFG considers its most current estimate and Licensees have had little, if any, feedback from CDFG on the tabulations that Licensees have been submitting in their annual reports to FERC. The Licensees expect CDFG to review their annual reports and to inform the Licensees of any data, statement, or finding CDFG believes to be incorrect. The Licensees are interested in further reviewing basin run estimates with CDFG and other TRTAC participants so the best scientific data and methods are used for any given run year. For example, differences based upon the estimation formula method used may need to be resolved in some cases.

Identifying Spawning Use versus Assessing Spawning Habitat Quality.

NMFS (p. 6, item 1) commented on the assessment of spawning gravel quality for certain restoration projects and spawning utilization. The quality and condition of spawning habitat on a river-wide basis was studied and monitored as approved by the TRTAC (Sec. 3.5.1.1). Spawning activity data by riffle or riffle reach is gathered by CDFG as part of the fall spawning survey and in their specific redd count study. The Licensees agree that the TRTAC should review spawning use data for TRTAC restoration sites and non-TRTAC projects (such as the CDFG gravel addition projects). Identifying spawning use, however, is distinct from assessing habitat quality.

Seining.

NMFS provided several comments regarding the Licensees' seining evaluations. Seining was initiated for the Don Pedro Project by CDFG in the early 1980's as a method to complement fixed location fyke net sampling that the resource agencies

[15] CDFG Comments, p. 3, ¶ 2.

began in the 1970's. It had been found that fyke net sampling can yield minimal catches over extended time periods – indicating limited movement past the stationary gear. In contrast, seine sampling conducted over the same time periods could provide much more information on the status of rearing fish and at many more sites, even though the seine sampling was not done on a daily basis. Approximate river reach location and suitability for seine sampling were the primary considerations used for site selection. The seine data, as collected, provides a relative index of abundance, much like routine seining surveys done elsewhere in the Central Valley. It is useful for production trends, although there has never been a requirement or expectation to obtain an absolute abundance estimate by this method. As contained in Report § 3.5.2.2, the fry density per female spawner aspect was reported on by the Licensees as required in 1996.

Rotary Screw Trapping of Hatchery versus Natural Smolts for Six-Week Period.

CDFG criticized the Report's depiction of screw trap catch of hatchery salmon relative to natural salmon. The screw trap catch described at Report § 4.1.2 correctly identified the component of the catch that was comprised of CWT hatchery salmon during the specified six-week period of spring pulse flows and Delta protection measures. Licensees are not aware of differences in capture likelihood between hatchery and natural smolts. The information simply showed that a significant portion of the salmon catch during the specific period were CWT smolts. Licensees did not represent that the reported data covered the entire outmigration period, which includes large numbers of unmarked natural fry in some years as depicted in Report Figure 3.5.2.4 –2. CDFG essentially made the same point in their comment that stated CWT smolts were 43% of salmon over 50 mm in the overall catch.

D. *O. mykiss*

Assertions that *O. mykiss* have been "ignored" by the Licensees or that FSA monitoring has been "inadequate, at the wrong locations, and at the wrong times" are not only inaccurate, but distract from the substantial collaborative effort that the TRTAC participants have put forth in recent years to evaluate the status of *O. mykiss* in the Tuolumne River. This includes considerable efforts by the Licensees well beyond the funding provisions of the FSA in response to TRTAC interest in gathering additional in-river information related to *O. mykiss*. The TRTAC monitoring program itself has several elements that collect *O. mykiss* data and that data has been filed with FERC and reviewed in the Report.

In the Report, the Licensees presented the available *O. mykiss* data from all studies and reviewed the increased efforts by several parties to gather additional information. See Report, pages 3-126 to 3-139. As was noted in the Report, Licensees have not been granted an ESA § 10 scientific take permit or allowed to conduct angling under other agencies' § 10 permit, so a primary method for gathering additional adult *O. mykiss* data has not been available to the Licensees. Another potential sampling method, electrofishing, has not been pursued by the Licensees within the upper reach due to heightened concerns by the resource agencies about its impact on *O. mykiss*. However, as noted in the Report, CDFG has recently conducted angling sampling of their own and previously used limited electrofishing to obtain specimens for their genetic study. The Report included the data provided to the Licensees from those efforts. Additional angling sampling is included in the TRTAC 3-year monitoring proposal that is currently under review by CALFED.

The Licensees also participated with CDFG in a winter/spring *O. mykiss* float survey program in 2004. In addition to the previously completed CDFG genetic study, CDFG is currently conducting an otolith study whose preliminary results CDFG has shared with the TRTAC over the past year - no anadromous *O. mykiss* have been identified to date. The *O. mykiss* mapping effort by CRRF was identified in the Report and contained in the GIS appendix. Reference to the provisions specifically made for *O. mykiss* in the Coarse Sediment Management Plan is in the Licensees' comments under habitat restoration. The Licensees agree that care would need to be taken if turbidity was increased in the spring by means of substrate disturbance. That is why the Licensees identified an option of artificially increasing turbidity by addition of suspended material.

The Licensees request that any remaining field information on *O. mykiss* from recent sampling efforts by others (e.g., angling) be made available to the TRTAC. The Licensees do not agree with the comments suggesting that (1) the Licensees should conduct otolith analysis because otolith testing is already being performed by CDFG, (2) the Licensees should perform specific genetic analyses, which we understand to be within the purview of the resource agencies, and (3) the Licensees should conduct another IFIM study for *O. mykiss* because *O. mykiss* were included in the prior IFIM evaluation completed by USFWS.

Commenters' requests for additional life-history investigations do not recognize that *O. mykiss* life-history is already relatively well-known (within varying degrees of

residency and anadromy). In addition, specific aspects of the *O. mykiss* life history are already under study by CDFG. The Licensees' seine and snorkel monitoring now consistently find *O. mykiss* within about the upper 10 miles of river immediately below LaGrange Dam. Primary *O. mykiss* habitat areas have already been mapped by CRRF. Although the specific origin of the observed resident *O. mykiss* has not been well established, the Licensees have identified likely upstream sources above human-made barriers and off-river hatchery fish planting sources. Screw-trap monitoring over the last 10 years has resulted in less than a one-smolt average per season, suggesting that either anadromy is very limited (also the possibility of anadromous progeny of resident parents) and/or the screw-trapping is not an effective sampling method under those Tuolumne River site conditions.

Some commenters asked for higher summer flows than currently provided in the minimum flow requirements, including the installation of additional facilities needed to make the infiltration gallery at River Mile 26 operational for the re-diversion of water for irrigation or domestic uses. Efforts to obtain additional flows in fulfillment of the FSA requirements were reviewed in Report § 3.2.4, including the status of the infiltration gallery. The existing benefits of the increased FSA summer flows over the pre-FSA flows were reviewed in Report § 3.5.3.1, particularly regarding the increased presence and distribution of *O. mykiss* and greater downstream extent of cooler water under the FSA flow schedules. Summer habitat for *O. mykiss* as well as over-summering salmon is provided to varying extents in all water years under the FSA flow schedule. The Licensees believe that the balance between water supply and fish flows in the FSA flow schedules should be maintained The Licensees are also willing to explore adjustments within the existing fish flow schedules by water year type.

VI. MEETING THE FSA GOALS

A. The FSA Contains No Numerical Goals for Production or Escapement.

Several commenters would retroactively incorporate into or apply to the FSA the CVPIA doubling goal developed by the USFWS (1995). As stated in the Report, historical escapement in both the Tuolumne River and the San Joaquin Basin have been highly variable and have corresponded with hydrologic trends and streamflow conditions throughout the basin. The CVPIA doubling goal numbers were considered during the FSA negotiations and rejected by the parties. Section 9 of the FSA specifically acknowledged that many of the factors that affect salmon abundance are

beyond the FSA participants' control so numerical goals were not adopted for the FSA. The use of the CVPIA doubling goal numbers as a means of evaluating success of the FSA would be a departure from an express provision in the FSA and has a number of technical shortcomings as well.

One of the goals of the CVPIA is to "develop within three years of enactment and implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long term basis, at levels not less than twice the average levels attained during the period of 1967-1991". In 2004, the USFWS contracted for an independent methods review for procedures needed to reliably detect attainment of the doubling goal in California's Central Valley (Newman and Hankin 2004). The review suggested that magnitude of errors of existing point estimates of natural production in California's Central Valley during the period of 1967–1991 and since 1992 may be very large and have not been estimated. In particular, the following factors compromise the ability to detect differences in population levels due to various management actions:

- Autocorrelation. Use of standard statistical techniques (e.g. t-test, regression, etc.) cannot adequately separate the contributions of the progeny of the same cohort affecting natural production in multiple years. It should be noted that although cohort reconstruction was attempted in the CDFG and USFWS supporting analyses to their comments on the Report, assumptions regarding the applicability of the CVI and Sacramento CWT age ratios to the Tuolumne River should be reviewed.

- Ocean Harvest. The use of the Central Valley Ocean Index (San Francisco + Monterey estimated total ocean salmon catches) as an estimate of total ocean catch of Central Valley, San Joaquin Basin or Tuolumne origin Chinook salmon is not validated through tagging efforts. It may be unreasonable to expect that the ratios of catch to escapement are the same for all Central Valley stocks of Chinook salmon.

- Separation of the proportion of total production attributable to hatchery fish depends upon assumptions that have not been bounded by precision and bias estimates. That is, the age structure, sex-ratios, and survival between tributaries and between hatchery and wild fish may differ substantially.

The review suggests that even assuming the historical production estimates provided by Mills and Fisher (1994) accurately reflect the population size in this period, assessing attainment of the doubling goal will require the initiation and implementation

of a far more rigorous tagging and monitoring program, particularly for the Sacramento Basin, than has been implemented by the resource agencies in the past.

B. Tuolumne Salmon Population Goals.

The third goal under FSA § 9 states, "Barring events outside the control of the participants to the settlement, by 2005 the salmon population should be at levels where there is some resiliency so that some of the management measures described herein may be tested, on an experimental basis." Because of the cyclical nature of Tuolumne River and San Joaquin Basin fall-run Chinook salmon escapements over the last fifty years, improving the resiliency of the Tuolumne salmon population has been an important goal of the Licensees since the 1980's. The other TRTAC participants have also stressed the importance of resiliency at TRTAC meetings and in their comments.

The best articulation, that the Licensees have been able to find, of the criteria for determining when the resiliency goal for San Joaquin fall-run Chinook salmon has been reached is contained in the USFWS' "Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes" (approved November 26, 1996, by Regional Director, Region 1, USFWS), which states,

> San Joaquin fall-run chinook salmon will be regarded as restored when (1) the number of naturally spawning fish in the Stanislaus, Tuolumne, and Merced rivers reaches a median number of 20,000 fish and the three-year running average does not drop below 3,000 fish, for 15 years, three of which are dry or critical years and (2) when the smolt survival rates [through the Delta] approach pre-project levels when adult numbers decline to less than 3,000 naturally spawning fish. * * * Salmon taken by hatcheries for artificial spawning will not be counted toward meeting criteria. [p. 125]

> * * * Until reliable measures of smolt survival [in the Delta] are available, the criteria for number of spawners will have precedence. When reliable survival criteria are developed, they should be used primarily in conjunction with the adult criteria. [p. 127]

The Licensees are not advocating the above recovery goal for the FSA, but it is one method for assessing the resiliency of the San Joaquin salmon population where the 50 year history of Tuolumne, Stanislaus, and Merced river escapements have shown clear boom and bust cycles. Assume that the 15-year period would begin in 1999 with the progeny of the fall 1996 escapement, the first year under the FSA, and

end with the fall 2014 escapement. Using the recent GrandTab estimates by CDFG, the first five years of that period, fall 1999 to fall 2004 currently have a median escapement of 19,255 spawners for the San Joaquin basin (excluding salmon taken at Merced River Fish Facility). Escapements resulting from the three recent Water Years (i.e., 2001, 2002, 2004) are expected to be relatively low since those were classified as Dry and recent VAMP experiments showed lower than expected Delta survival in 2003 and 2004 (Report Table 4.4.1.4-1, p. 4-38). However, the recent three year running average for 2001–2004 was 15,687, well above the 3,000 spawner minimum for the San Joaquin Basin.

Under the USFWS Recovery Plan adult criteria, the Licensees would contend that the "some resiliency" goal of FSA § 9 has already been met. Although CDFG disagrees, the Licensees further contend that by allowing the sport take of San Joaquin fall-run Chinook salmon, the California Fish and Game Commission has determined that San Joaquin salmon are of sufficient abundance or resiliency to allow such take.

VII. ADDITIONAL FSA MEASURES

Several comments questioned the benefits of additional measures proposed to be implemented under FSA Section 9 as part of the adaptive management strategy for the Tuolumne River Chinook salmon population (e.g., NHI, p. 6, ¶. 2; USFWS, pp. 13-14), instead focusing upon additional flow augmentation (CDFG, p. 14, ¶ 3) before the benefits of the current flow schedule, implemented and planned restoration projects could be evaluated. For example, several comments stated that no spawning barrier experiments should be conducted on the Tuolumne River (FOT, p. 4 ¶ 2; SFF, p. 3, ¶ 3; USFWS, p. 13 ¶ 5).

Contrary to the position of CDFG[16], the mechanism of density dependent mortality due to redd superimposition has been well documented through direct observations on the Tuolumne River (TID/MID 1991 Appendices 6 and 7) and explains the historical observation of reduced production in years following high escapements. A subsequent redd superimposition model (TID/MID 1997, Report 96-6) was used to illustrate the impacts of density dependence on subsequent escapement and the potential for increased escapement through the use of temporary spawning barriers.

[16] CDFG Comment p. 5 ¶ 2

Spawning barriers serve as a means of preventing redd superimposition of late arriving spawners over earlier arriving spawners. In conjunction with the other flow- and non-flow measures within the FSA, spawning barriers are a means to increase long-term escapement levels. Spawning barriers are currently used at Battle Creek and Clear Creek [17] [18] with the goal of segregating spring and fall-run Chinook salmon that have overlapping spawning periods. Similarly, spawning barriers were recently proposed in a draft restoration plan for the Stanislaus River[19] (CRRF 2002) as a means of segregating potential spring-run Chinook salmon from the known fall-run population there. The use of spawning barriers was first proposed by the Licensees in 1991 (TID/MID 1991, Appendix 6) and was included in the FSA (See Section 12 paragraph d) with the consent of other TRTAC participants. Like these other rivers, spawning barriers on the Tuolumne would serve to prevent superimposition related mortality of early arriving fish (or "runs" in other rivers) from later arriving fish.

While the Report did not indicate redd superimposition was a major factor limiting the Tuolumne River Chinook salmon population in low escapement years, maximizing productivity of the available spawning gravels is a shared goal of all TRTAC members. Spawning barriers can be implemented in conjunction with other existing and planned measures. Supporting model evaluations performed in 1997 show the potential benefits in reducing superimposition at escapements as low as 5,000 spawners (TID/MID 1997 Report 96-6). In this manner, spawning barriers will enhance the productivity of existing and restored spawning gravels and will contribute materially towards the attainment of the FSA goals.

VIII. CONCLUSION

The forgoing represents a brief response to some of the comments and issues raised by interested parties regarding the Report. This letter is not intended to respond to all of the statements, characterizations, and recommendations contained in the dozen

[17] Earley, J. T., M. Brown. 2004. Accurately Estimating Abundance of Juvenile Spring Chinook salmon in Battle and Clear Creeks Proceedings of the 2004 CALFED Bay-Delta Program Science Conference, Sacramento, California. October 4-6.

[18] Brown, R. and W. Kimmerer. 2004. A Summary of the October 2003 Battle Creek Workshop, October 7 and 8, 2003 for the Science and Ecosystem Restoration Programs of the California Bay-Delta Authority. http://battle-creek.net/docs/BattleCreekWorkshopSummaryV5.pdf

[19] CRRF. 2002. The Lower Stanislaus River Restoration Plan. Initial Working Document prepared by the California Rivers Restoration Fund, in partnership with Carl Mesick Consultants and S.P. Cramer and Associates, on behalf of the Stanislaus River Fish Group (SRFG). 10 December.
http://www.calriversfund.org/Draft%20Stan%20River%20Restoration%20Plan.pdf

or so filings received by the FERC. The Licensees continue to believe that the filings contain a number of serious misunderstandings and misstatements of the facts that could be resolved through a thorough reading of the Report and an open and objective discussion of the questions at hand.

Accordingly, the Licensees recommend that these issues be referred to the TRTAC for resolution. As previously stated, the TRTAC was established to deal with such matters and, despite some comments to the contrary, has an effective track record of working through various viewpoints to find common ground and ultimately arrive at a consensus-based conclusion. The Licensees would envision dedicating the necessary time to deal point by point with all of the issues raised in a manner that would take into consideration all viewpoints in a process leading to conclusions that could be scientifically supported.

Lastly, as expressed in Chapter 5 of the Report, the general measures and activities contained in the 1996 FERC order should be allowed to continue through the remaining license period. While much good has been achieved over the last ten years, not enough time has passed to conclusively demonstrate the value, or lack thereof, of some of the prescribed measures. For example, the existing flow schedules need to be in place during a sufficient number of water year types before a scientific conclusion can be reached. Likewise, additional time is needed for the restoration efforts to be completed and their benefits assessed. Many of the other measures are adaptive in nature and were meant to be adjusted and refined as necessary. This process should be allowed to continue.

The Licensees hope the above comments and thoughts will help the FERC to better understand our perspective on these issues. Should the FERC be interested in a more detailed response to any of the questions raised, we would be happy to provide them.

Sincerely,

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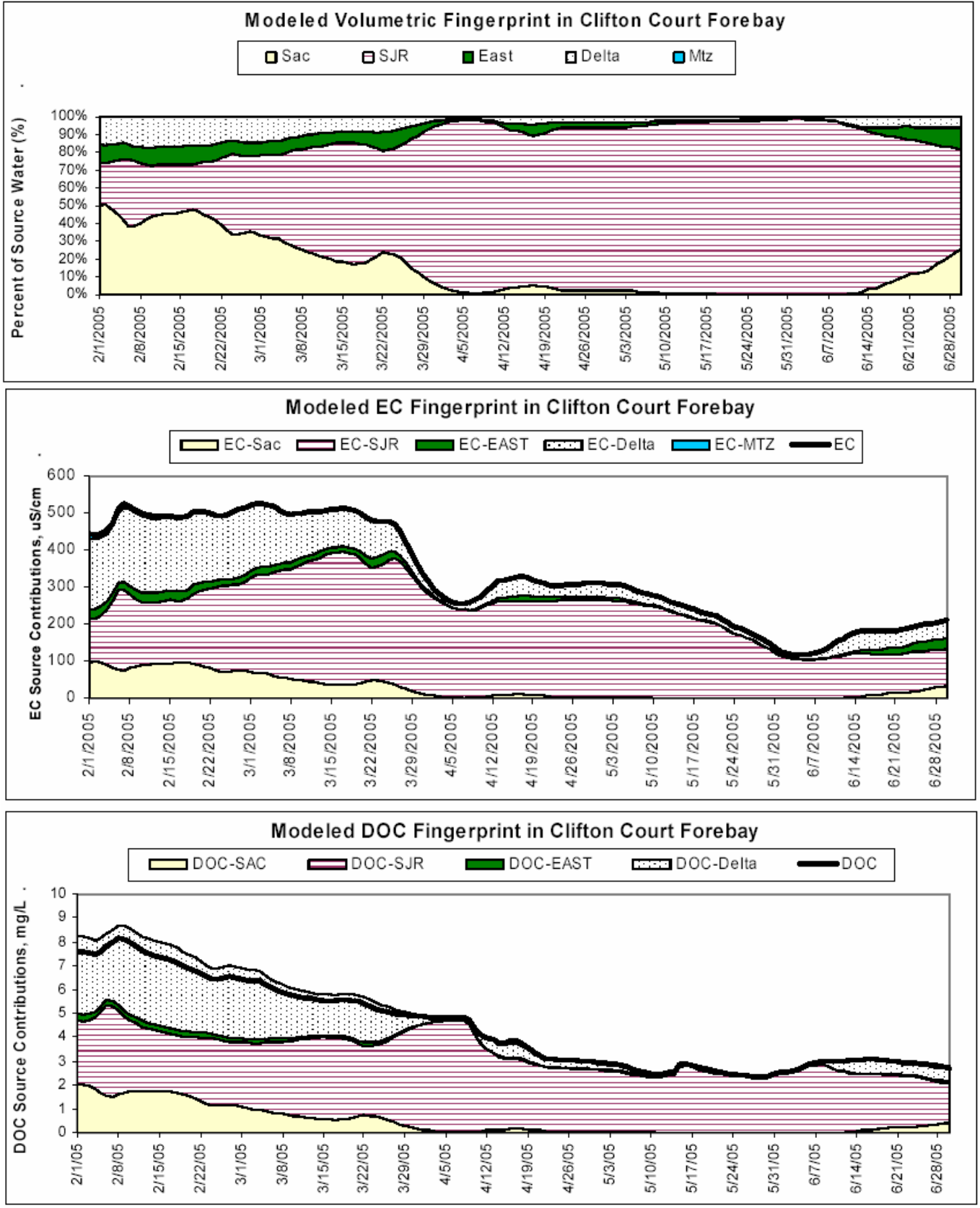

Figure A. Origin of water arriving at the Delta export facilities in 2005. Note that exports consist principally of water originating from the San Joaquin Basin. Reproduced from *Real Time Data and Forecasting Project Water Quality Weekly Report*, Volume 2 Issue 31, Office of Water Quality, CDWR, 9 August 2005.

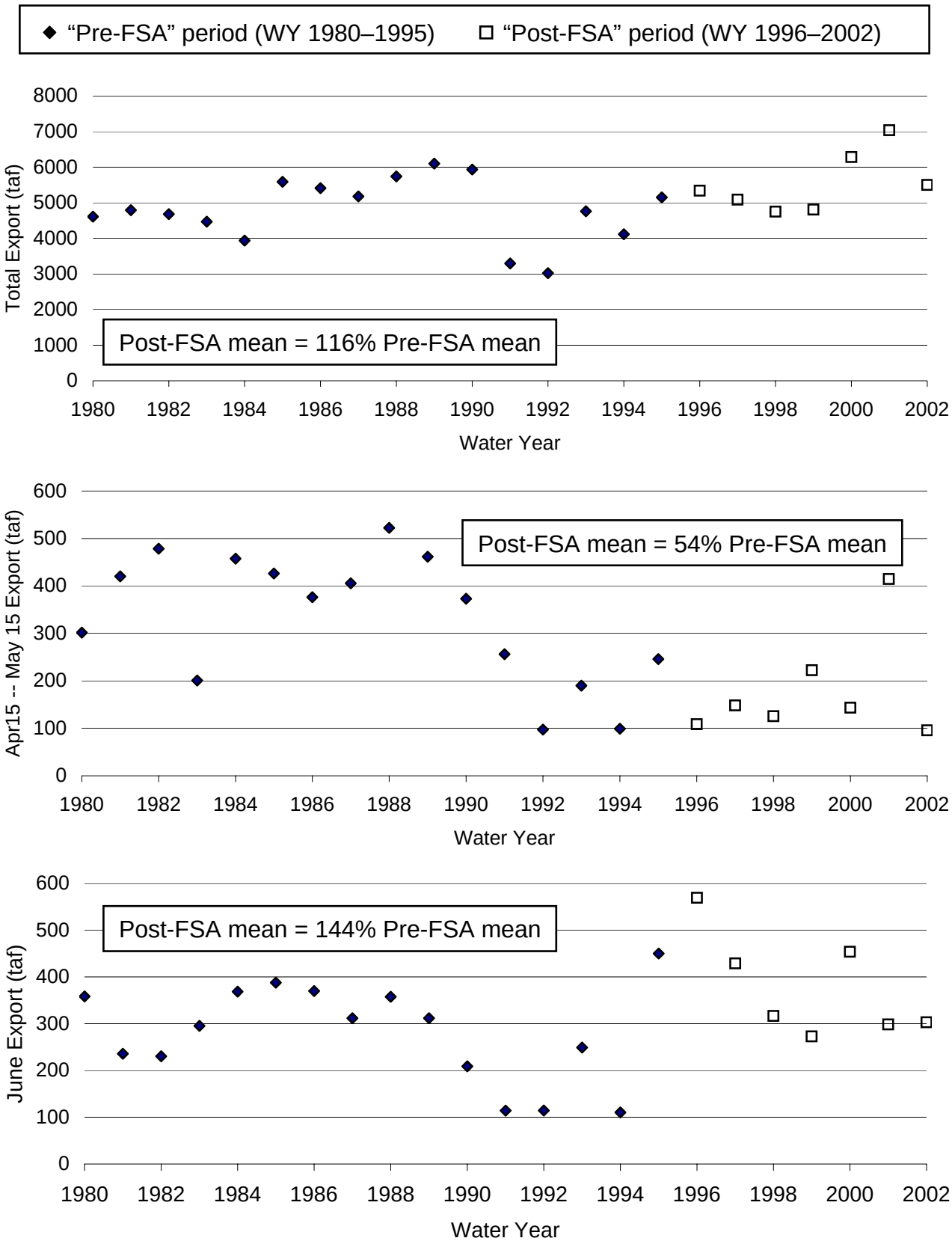

Figure B. Combined CVP, SWP, and CCC export volume for various periods. Note that although efforts have been made to reduce exports during at least part of the smolt outmigration period (April 15 – May 15), overall export rates at other times of year have increased significantly (Figure based on daily values reported in DAYFLOW developed by the Interagency Ecological Program at http://iep.water.ca.gov/dayflow/).