33.10.26 Natural Resources Defense Council

BISON CONNECT

Fwd: NRDC comments on SLWRI - attachments (2 of 2 emails)

KATRINA CHOW <kchow@usbr.gov> Wed, Oct 23, 2013 at 1:09 PM
To: KATHLEEN DUNCAN <kduncan@usbr.gov>

Sent from my iPhone

Begin forwarded message:

From: "Obegi, Doug" <dobegi@nrdc.org>
Date: September 30, 2013, 5:10:56 PM PDT
To: "KChow@usbr.gov" <KChow@usbr.gov>
Cc: "Rachel Zwillinger (external)" <rzwillinger@altshulerberzon.com>
Subject: NRDC comments on SLWRI - attachments (2 of 2 emails)

Dear Ms. Chow,

Attachments 2 and 3 to our comments are included with this email.
Please let me know if you have any problems opening the attachments.

Sincerely,

Doug

Doug Obegi

Staff Attorney*

Water Program

Natural Resources Defense Council

111 Sutter Street, 20th Floor

San Francisco, CA 94104

415.875.6100 (phone)

415.875.6161 (facsimile)

* *Admitted to practice in California*

2 attachments

Attachment 2.pdf
1989K

Attachment 3.pdf
33K

NRDC

NATURAL RESOURCES DEFENSE COUNCIL

January 28, 2013

Katrina Chow
Project Manager
Bureau of Reclamation
2800 Cottage Way, MP-720
Sacramento, CA 95825-1893

Sent via email to BOR-MPR-SLWRI@usbr.gov

RE: Comments on Draft Feasibility Report for Shasta Lake Water Resources Investigation

Dear Ms. Chow:

On behalf of the Natural Resources Defense Council, which has more than 250,000 members and activists in California, I am writing to provide brief comments on the draft feasibility report for the Shasta Lake Water Resources Investigation ("SLWRI"). The draft feasibility report and preliminary draft environmental impact statement ("preliminary DEIS") are significantly flawed, and do not accurately analyze the cultural and environmental impacts of the project. Below we highlight several of the problems with the analysis.

NRDC4-1

First, the SLWRI will cause significant and unavoidable effects on cultural and tribal resources. The Winnemem Wintu Tribe has prepared detailed comments on the draft feasibility report, and we support their comments on the significant adverse effects of the project on cultural and tribal resources.

NRDC4-2

Second, the draft feasibility report and preliminary draft environmental impact statement ("preliminary DEIS") are fatally flawed because they analyze effects based on an unlawful operational scenario (2004 OCAP). *See* draft feasibility report at ES-11, 2-42 to 2-44, 6-13. The analysis wholly ignores requirements in more recent biological opinions regarding Shasta Lake minimum end of September reservoir storage, as well as restrictions on operations in the Delta to avoid jeopardizing the continued existence and recovery of winter run Chinook salmon and other native fish species.[1] As a result, the analysis overestimates benefits to fish and wildlife and to water supply. *See id.* at 5-20 to 5-21 (acknowledging that implementation of the existing

NRDC4-3

NRDC4-4

[1] The 2009 NMFS biological opinion is available online at: http://www.swr.noaa.gov/ocap/NMFS_Biological_and_Conference_Opinion_on_the_Long-Term_Operations_of_the_CVP_and_SWP.pdf. The 2008 U.S. Fish and Wildlife Service biological opinion is available online at: http://www.fws.gov/sfbaydelta/documents/SWP-CVP_OPs_BO_12-15_final_OCR.pdf. These documents are incorporated by reference. The Bureau of Reclamation has recently reiterated in filings with the Federal District Court for the Eastern District of California that it will continue to operate in compliance with these biological opinions and RPA actions. *See, e.g., Consolidated Salmonid Cases*, Case No. 1:09-cv-00407-LJO-DLB, Doc. 726. Therefore, the draft feasibility report must utilize an operational scenario that is consistent with these existing biological opinions in the analysis of the effects of the SLWRI.

NRDC4-3 CONTD

www.nrdc.org
111 Sutter Street
20th Floor
San Francisco, CA 94104
TEL 415 875-6100 FAX 415 875-6161

NEW YORK · WASHINGTON, DC · LOS ANGELES · CHICAGO · BEIJING

NRDC4-4 CONTD

RPA actions will reduce water supply benefits shown in the analysis, and acknowledging that there is "significant uncertainty" as to the magnitude of benefits from implementing the RPA actions and the SLWRI).

NRDC4-5

In order to provide accurate information to the public, consistent with the requirements of NEPA, the draft feasibility report and preliminary DEIS must be substantially revised to incorporate the existing biological opinions. In addition, the documents must include an analysis of climate change effects in order to provide adequate information on the potential impacts of the project. *See id.* at 5-28. The effects of climate change are part of the regulatory baseline.

NRDC4-6

Similarly, the preliminary DEIS acknowledges that the SLWRI is likely to reduce Delta outflow, but it unlawfully assumes that the only significant impacts would be in December and January, and that any changes in delta outflow (or X2) that still meet the minimum requirements of D-1641 would not cause a significant impact. *See* Preliminary DEIS at 6-36.

NRDC4-7

However, reductions in Delta outflow are likely to result in a significant environmental impact, including impacts on longfin smelt (which is listed under the California Endangered Species Act) and numerous other fish and wildlife species.[2]

NRDC4-8

In addition, the wild and scenic resources of the McCloud River are protected under California law. Cal. Public Res. Code §§ 5093.50 *et seq.* However, the documents demonstrate that the SLWRI will inundate protected segments of the McCloud River, in violation of state law, and it appears that the project likely will adversely affect its wild trout and fishery. *See* Preliminary DEIS, Chapter 25.

NRDC4-9

Finally, the draft feasibility report assumes that the vast majority of the costs would be for fish and wildlife purposes. However, because the analysis largely ignores the improved carryover storage requirements for Shasta Reservoir under the existing biological opinion (NMFS 2009) to protect salmon listed under the Endangered Species Act ("ESA"), the analysis appears to dramatically overstate the ecological benefits of increased storage by ignoring these ESA requirements. As a result, the cost-benefit analysis is highly flawed and unreliable. Meeting existing mitigation or other legal requirements, such as ESA requirements in the 2009 NMFS biological opinion, cannot result in fish and wildlife benefits of the project; any fish and wildlife benefits must be in addition to existing legal requirements.

NRDC4-10

The cost-benefit analysis must be entirely redone, utilizing a lawful operational scenario and only assessing fish and wildlife benefits for additional protections (not existing mitigation or other requirements). The assessment of benefits to fish and wildlife must also incorporate the adverse effects of the project, and cannot only consider beneficial effects.

NRDC4-11

The current cost: benefit analysis appears to propose that the public should pay for mitigation that is already required, for effects that are likely to harm the Bay-Delta ecosystem, and for effects that significantly and unavoidably harm the Winnemem Wintu Tribe, its tribal heritage, and the wild and scenic resources of the McCloud River. That is wholly inappropriate.

NRDC4-7 CONTD

[2] For instance, the State Water Resources Control Board's 2010 Public Trust flow report concluded that, based on the best available science, the abundance of longfin smelt (as well as the abundance of other species, such as *Eurytemora affinis*) is positively correlated with Delta outflow, and that substantial increases in Delta outflow are necessary to fully protect longfin smelt and other Public Trust resources. That report is available online at: www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf and is incorporated by reference.

NRDC comments on SLWRI Preliminary Feasibility Report
January 28, 2013

Thank you for consideration of our views. Please contact us at your convenience if you have any questions about these comments or would like to discuss them further.

Sincerely,

Doug Obegi
Staff Attorney

ATTACHMENT 3:
See Copy of letter to the Bureau of Reclamation, January, 2006, on SALMOD enclosed.

State of California The Resources Agency ARNOLD SCHWARZENEGGER, Governor
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
601 Locust Street
Redding, CA 96001
(530) 225-2363

February 3, 2006

Mr. James DeStaso
U.S. Bureau of Reclamation
16349 Shasta Dam Boulevard
Shasta Lake, CA 96019

Dear Mr. DeStaso:

Initial Comments on the SALMOD Model and Shasta Lake Water Resources Investigation Related to Enlarging Shasta Dam

The U.S. Bureau of Reclamation (BOR) is planning to use the SALMOD fisheries model on the upper Sacramento River in their effort to analyze the effects of the Enlarged Shasta Project (Project). The Department of Fish and Game (DFG) is providing our concerns and comments for BOR to consider in using and/or modifying the SALMOD model. The DFG is also providing other sources of information and tools that should be considered in the Project evaluation and an initial list of natural resource issues that should be addressed, in addition to fisheries, as part of the Project investigation.

The DFG has three general areas of concern with the use of SALMOD as an evaluation tool for the Project. We have divided our comments into these three areas of concern which include, but may not be limited to, the assumptions used in the model, validation of the model, and further considerations. We provide the following specific concerns and comments for your consideration.

SALMOD Assumptions:

We question whether the primary assumption of the model is valid (i.e., egg and juvenile fish mortality are directly related to spatially and temporally variable microhabitat limitations which are directly related to the timing and quantity of stream flow). Data collected in recent years for winter-run Chinook salmon (*Oncorhynchus tshawytscha*) at Red Bluff Diversion Dam indicate the number of juveniles emigrating from the upper Sacramento River correlates very closely with the number of adult spawners (Gaines and Poytress 2003). This suggests that at the current winter-run population levels, over the range of flows and water temperatures that have occurred in recent years, physical habitat does not appear to be limiting juvenile production. The upper Sacramento River is a

very large and complex system, much larger than the Trinity River system where SALMOD has been used. It is not intuitive that physical habitat for rearing of a few million juvenile salmon would currently be limiting their production on the Sacramento River.

The DFG is concerned that the SALMOD input assumptions may not adequately address species habitat preference, selection and behavior. SALMOD is based on the premise that egg and fish mortality is directly related to spatial and temporally variable micro and macrohabitats. It is our understanding that SALMOD assumes that mesohabitats with more suitable habitat have a higher capacity than those with less suitable habitat. However, it has been our experience on the Klamath River that habitat-induced movements may be substantially influenced by the presence or absence of specific micro, submeso, meso, or macrohabitat types. Consequently, a habitat use, preference and availability investigation should be conducted for various anadromous salmonid races and life stages to obtain appropriate input data before using SALMOD on the Sacramento River. Such an investigation may identify other important subhabitat components which should be included in the SALMOD analysis. The DFG recommends that BOR review the available information and literature for micro, submeso, meso, and macrohabitat availability and species life stage habitat selection on the Sacramento River. We also recommend using the functional cover type definitions on pages 17 and 18 of Hardin (2005). If insufficient information is available to identify habitat availability and importance, BOR should conduct necessary investigations to obtain these data.

DFG believes BOR should consider work completed on the Klamath River as an example of the importance of considering other subhabitat components in salmonid habitat preference, selection and availability analyses. Meso and submesohabitat units have been shown to be important to young salmonids in the Klamath River. Inundation of specific vegetation (e.g., emergent and nonemergent aquatics, young willows, grasses, etc.) during specific times of the year provides critical habitat for coho fry (*Oncorhynchus Kisutch*), but somewhat less so for Chinook. Hard substrate elements (rocks, boulders, etc.) are not used extensively (Smith, 2005). In addition to the specific inundated vegetative component, the proximity of the component to the fish (or in the case of a model, the modeled station or focal point) may also be critical. For example, on the Klamath River approximately 96% of nearly 7,000 observed Chinook fry (across several different years and flows) were found within two feet of inundated vegetation. The vast majority of these fish were not within (i.e., actively using) the vegetation. This was termed "escape cover," as the fish are not actively using the component (Smith, 2005). Sacramento River anadromous salmonids may or may not demonstrate similar habitat selection and/or orientation as their

Klamath River counterparts. Moreover, Sacramento River habitat availability (existing and/or restored) may differ from the Klamath River. Thus, Klamath River data should not be applied on the Sacramento without validation of transferability.

Bartholow (2003) states, "...I have assumed that the four races do not use, and compete for, the same microhabitat at the same time...". We believe this assumption is an over-simplication because it implies that juveniles of each Chinook race sequentially use rearing habitat in the upper river and have no overlap in residence period. Chinook juveniles of all sizes and multiple races rear in the upper river year-round and should be addressed in the model.

Superimposition of redds is also a factor in the SALMOD model which is assumed to limit spawning success. At current population levels, superimposition is not commonly observed and probably is not a significant factor influencing production of anadromous salmonids in the upper Sacramento River. Consequently, the DFG recommends removing this factor as a model assumption.

Another assumption that should be dealt with carefully is the temperature tolerance function in the model. The overall temperature tolerance criteria currently used in SALMOD meets the regulatory objectives. The life stage data pertaining to temperature criteria are also valid. The DFG believes it is important whenever possible to meet these regulatory standards for anadromous fish in the upper Sacramento River and to use the best available scientific information. However, it is also important from a fishery management perspective to use the precautionary principle, i.e. there is the need to take action in advance of having complete, conclusive data in order to avoid potentially catastrophic events. This is particularly true for a listed species such as winter-run Chinook salmon. The use of only regulatory temperature assumptions in SALMOD could limit the length of habitat judged to be suitable for future temperature management of the Sacramento River. There are foreseeable drought conditions when cold water reserves in Lake Shasta will not meet the regulatory temperature objectives for the survival of winter-run Chinook. Predictions from a planning report for the Shasta outflow temperature control device indicates in at least ten out of every 100 years, cold water reserves will be limited (USBR 1991). Under these conditions BOR and fishery managers will have to make difficult decisions on how and when to use those limited cold water reserves. Temperature-induced mortality of eggs and fry is dependent upon both temperature and exposure time (FWS 1990). The USFWS (1999) evaluated the effects of temperature on survival of winter-run Chinook at four stages of embryonic development. The USFWS study was not rigorous enough to clearly identify a critical life stage for which to provide the regulatory temperature of 56°F. However, the study did show the importance of maintaining low temperatures at the earliest life stages of embryonic development.

DFG requests that modeling runs be conducted for dry and critically dry years which take into account the potential increased survival rates of these early life-history stages when provided cooler water. Modeling results of this sort will be valuable to BOR and fishery management agencies in developing management strategies to best ensure the survival of winter-run Chinook salmon under drought conditions in the Sacramento River.

Modeling runs should also include the current operations of Shasta Dam and operations under an enlarged Shasta scenario. A comparison of modeling outputs with and without the Project will help identify potential benefits or detriments of the Project.

SALMOD Validation:

SALMOD appears to have potential value, but has not been adequately validated for the upper Sacramento River except on a very gross scale. SALMOD should be used in conjunction with other models and empirical studies to validate output before it is used in a decision making process. For example, C-Pop, which was developed by Biosystems, Inc. (under contract with National Marine Fisheries Service), is another resource for assessing fall-run and winter-run Chinook (two separate models). The main scientist and modeler for C-Pop is Wim Kimmerer, who is now a member of the California Bay Delta Authority, Ecosystem Restoration Program Science Board. Population dynamics factors used in the SALMOD model must be validated if the model is to be of any use for the Sacramento River.

The DFG is concerned with the current lack of validation regarding the model's density-dependent assumptions for juvenile life stages. Given the large size of the Sacramento River and its length, it will be difficult to work with a density-dependent model. The validation step will be extremely difficult and will require a detailed evaluation of the Instream Flow Incremental Methodology (IFIM) study which has recently been completed on the Sacramento River by USFWS. Minimally, some effort should be made to run the model with populations that were present in the 1960's since the density of juveniles was much higher then. Quantitative juvenile Chinook data are also available from rotary screw trap sampling at Red Bluff Diversion Dam (RBDD) and could be used to validate model predictions.

Further Considerations for SALMOD:

Bartholow (2003) indicates the downstream extent of the study area for the original SALMOD model was the mouth of Battle Creek because hatchery-reared salmon from Coleman National Fish Hatchery on Battle Creek confound the enumeration of natural spawned salmon in the Sacramento River downstream of

that point. A noticeable proportion of fall-run Chinook spawning, which takes place in the Sacramento River upstream of the mouth of Battle Creek, also includes hatchery origin fish (Killam and Arrison 2005). The influence of these hatchery origin salmon on the production of natural fall-run Chinook from the Sacramento River above and below Battle Creek should be taken into consideration in the SALMOD modeling analysis.

Tributaries to the Sacramento River must also be considered for their substantial role in providing habitat to juvenile salmonids as they migrate downstream. Large perennial tributaries to the Sacramento River provide spawning and rearing habitat (e.g., Battle Creek, Cow Creek, Clear Creek, Cottonwood Creek, Deer Creek, Mill Creek, and others). Smaller tributaries also play a role in providing non-natal rearing habitat for juveniles (Maslin, et. al. 1996). We recommend consideration of non-natal tributary rearing habitat and natal tributary production and rearing habitat as important factors in your modeling efforts.

There is doubt that a distinct spring-run Chinook salmon population still spawns in the main-stem upper Sacramento River, because spawn timing and areas overlap with fall-run Chinook spawning. However, main-stem and tributary rearing habitat for juvenile spring-run Chinook should still be considered for known tributary populations including Clear Creek, Battle Creek, Beegum Creek, Antelope Creek, Mill Creek, Deer Creek and Butte Creek.

To the degree it is applicable and/or comparable to conditions on the Sacramento River, we recommend review of Trinity River Record of Decision (ROD), implementation plan and flow evaluation report. There is also a detailed science framework being developed that will incorporate SALMOD as one of the tools to evaluate success of the program. The use and limitations of SALMOD on the Trinity River should be consistent with its use on the Sacramento River.

Further Project Considerations:

The DFG is concerned with the geographic scope for Project modeling and impact analysis. The recent notice of intent filed on the Shasta Lake Water Resources Investigation (SLWRI), identifies the primary study area as Shasta Dam and Reservoir; tributary rivers and streams including the upper reaches of the Sacramento River, McCloud River, Pit River, and Squaw Creek; and the Sacramento River downstream from Shasta Dam to about the RBDD. Because of the potential influence of a Shasta Dam modification on natural resources along the Sacramento River and on programs and projects in the Central Valley, the extended study area includes other major tributaries to the Sacramento River, the Sacramento-San Joaquin Delta, San Joaquin River basin, and service

areas of the Central Valley Project (CVP) and State Water Project (SWP). The DFG wants to clarify that the extended study area should also include all of the Sacramento River from Shasta Dam to the Delta. We believe that any modeling effort or impact analysis for the Project must cover the entire Sacramento River system, tributaries and the Sacramento-San Joaquin Delta.

The Project analyses should consider existing conditions, other foreseeable water projects and restoration efforts, legislated programs, applicable permits and likely conditions if the Project is implemented. For example, we recommend review and consideration of coordinated operations and cumulative impacts of the Project with a potential North of Delta Offstream Storage Project (NODOS) currently being evaluated by the California Department of Water Resources (DWR). Restoration Programs such as the Trinity River Restoration Program (TRRP), California Bay Delta Authority (CBDA) Ecosystem Restoration Program (ERP), and Central Valley Project Improvement Act (CVPIA) Anadromous Fish Restoration Program (AFRP), are good sources for current and foreseeable restoration projects. The Project must also be evaluated with respect to mandates and guidance from the CVPIA, CALFED and CBDA programs and programmatic environmental documents, the Water Rights Permit for Shasta Dam and the Trinity River Record of Decision.

As an example, the water rights permit for Shasta Lake requires the same flows below Red Bluff Diversion Dam (RBDD) as below Keswick Dam. Flows below Red Bluff may be affected by the NODOS Program if Sites Reservoir is built. The BOR flow and impact analysis of the Project should consider scenarios with and without a Sites Project. The analysis must also address how to meet the requirements of the Shasta Lake water rights permit.

The programmatic environmental documents for CVPIA and CALFED; relevant technical analyses on the Sacramento River; fisheries survey data for adult and juveniles from the USFWS and DFG programs; and hearing records for the upstream of Delta elements of the SWRCB Bay Delta Hearing process (SWRCB 2000) are examples of references available for developing baseline information.

There are also State and Federal numeric restoration goals that have been legislatively mandated and should be considered, such as doubling anadromous fish populations identified in the AFRP Working Paper (1995) and CBDA ERP milestones, targets, and actions.

BOR should also consider limiting factors developed by the AFRP in its Project analyses. Based upon the Working Paper on Restoration Needs, Volume 3 (1995), there are six primary limiting factors affecting salmon and steelhead in

the upper main-stem Sacramento River:

1) changes in the natural frequency, magnitude, and timing of flows;
2) water temperature changes;
3) passage at artificial migration barriers;
4) toxic discharges;
5) effects of hatchery stocks on natural stocks; and
6) loss of riparian forests and associated rearing habitat and water temperature moderation capacity.

Some of the identified solutions developed by AFRP have been implemented (e.g., correcting fish passage problems at the Anderson Cottonwood Diversion Dam and Glenn Colusa Irrigation District Dam, and maintaining water temperatures in the river), but many are still relevant (Table 1). These limiting factors should be considered by BOR with regard to its enlarged Shasta studies and evaluations to avoid exacerbating existing conditions or undoing some of the accomplishments and investments made by CVPIA and the CBDA.

Table 1. Upper Main Stem Sacramento River Limiting Factors as per the AFRP Working Paper (1995):

Limiting Factors	Potential Solutions
Instream flows	1. Regulate CVP flow releases to provide adequate spawning and rearing habitat 2. Avoid flow fluctuations to avert dewatering redds or stranding or isolating adults and juveniles 3. Consider all effects of flow on ecosystem
Water temperatures	1. Maintain water temperatures at or below 56 F to at least Bend Bridge to Keswick Dam except in extreme water years
Passage at artificial impairments is inadequate	1. Correct migration problems at RBDD 2. Correct fish passage and other problems at the ACID's diversion dam 3. Avoid entrapment of adults at Keswick Dam stilling basin 4. Correct unscreened pump diversions 5. Correct problems at the GCID water diversions
Contaminants	1. Remedy water quality problems associated with Iron Mountain Mine and other toxic discharges
Effects of hatchery stocks on natural spawning stocks is unknown	1. Evaluate competitive displacement between hatchery and natural stocks 2. Evaluate displacement of natural stocks by hatchery stocks 3. Maintain genetic diversity in hatchery stocks 4. Evaluate disease relationships between hatchery and natural stocks
Loss of riparian forests	1. Restore and preserve riparian forests

Limiting factors for the lower Sacramento River are not identified in the AFRP Working Paper. However, there are limiting factors identified for its tributaries (as well as the tributaries of the upper Sacramento River). These should be considered to the extent those tributaries may be affected by changes in flows as a result of enlarging Shasta Dam.

The final recommended flows to benefit fish species as a result of the Project will also have a potential effect on other natural resources associated with the Sacramento River. Consequently, the DFG has developed an initial list of other items to consider in concert with the fisheries analysis. As part of the fisheries analysis and management recommendations, the following ecological components are needed to better assess the entire ecosystem.

- **Retention and enhancement of riparian forests:** Analysis of the effect of the Project on riparian habitat should be included within the SLWRI. Riparian habitat in systems such as the Sacramento Valley is dependent upon large-scale physical processes of the river. These processes include, but are not limited to, channel migration or meander, erosion and deposition, hydrology of flooding, summer low flow cycles, and such issues as cottonwood recruitment.

  By the 1980's less than 5% of the Sacramento River's riparian habitat remained (Sacramento River Conservation Area Forum 1989). State Senate Bill 1086, which passed in 1986, established the Upper Sacramento River Fisheries and Riparian Habitat Advisory Council. This multi-agency, multi-interest advisory council developed plans and procedures to solve fisheries and riparian habitat problems of the Sacramento River and tributaries - from Keswick Dam to the mouth of the Feather River. SB-1086 also called for a management plan to protect, restore, and enhance fish and riparian habitat and associated wildlife of the upper Sacramento River. The law evolved from two separate bills, one to inventory riparian habitat and the second to develop an Upper Sacramento River Fisheries and Riparian Habitat Management Plan.

  The plan (completed in 1989) identifies specific actions that will help restore the Sacramento River fishery to its optimum state and protect and restore riparian habitat. An additional document, the Sacramento River Conservation Area Handbook, was also prepared by the Sacramento River Conservation Area Forum (SRCAF) which provides river managers with a framework of ecology and policy to guide on the ground decisions. The DFG believes that recommendations and action items in the plan and handbook should be incorporated into the SLWRI analysis and environmental impacts analysis. You may also wish to coordinate with the SRCAF in Red Bluff (Burt Bundy, SRCAF Manager, [530] 528-7411).

With respect to regulatory considerations, DFG has a policy of no net loss of wetland habitat (Fish and Game Code §§ 1600-1607, 1775-1779.5, and 1790-1792.5). Fish and Game Code §§ 1385-1391, which describes the California Riparian Habitat Conservation Program, also identifies the importance of, and criteria for, protecting river and riparian natural resources. In addition to requirements for implementing a program to double natural production of Central Valley anadromous fish, the CVPIA *(Title 34 of Public law 102-575, Section 3406(b)(1))* requires giving first priority to measures which protect and restore natural channel and riparian habitat values through habitat restoration actions, modifications to Central Valley Project operations, and implementation of the supporting measures mandated by the CVPIA.

- **Terrestrial species:** Many terrestrial species, including Federal and State listed species and species of concern, utilize the river system for foraging, dispersal, and reproduction. Neotropical migratory birds are heavily reliant on healthy riparian forests, as are a number of amphibian species, insects, and mammals. An evaluation of the impacts of the Project should also assess the effect on these species.

- **Floodplain management/inundation benefits:** Some of the most significant impacts dams can have on the character and functioning of rivers are through changes of geomorphic processes. This includes affecting sediment transport processes, channel erosion rates, inundation of the floodplain, riparian habitat loss, riparian encroachment, accelerated invasion of noxious and invasive plants and maintenance of instream habitat conditions (e.g., spawning gravel). While the proposed management of flow associated with the Project has not yet been determined, we have concerns that enlarging Shasta will further reduce flood frequency and thereby degrade floodplain conditions. An analysis of geomorphic processes and consideration of implementing a natural hydrograph is an essential part of the SLWRI.

Other Analytical Tools:

The DFG has significant concerns regarding use of the SALMOD model to evaluate effects of changes in flow management in the upper Sacramento River on Chinook salmon production. It is DFG policy to use IFIM and Physical Habitat Simulation (PHABSIM) modeling to evaluate instream flow needs in California. We therefore recommend that BOR use IFIM and PHABSIM to evaluate the Project. Analyses should include additional habitat suitability and availability investigations, and validation of PHABSIM outputs to evaluate flows associated with the Project.

Biosystems, Inc. developed C-Pop, which is actually two models for specifically assessing fall-run and winter-run Chinook salmon on the Sacramento River. We recommend that BOR coordinates closely with the lead scientist (Wim Kimmerer) of Biosystems, Inc. to consider C-Pop as an additional tool in your Project evaluations. Biosystems' experience in developing C-Pop may help BOR in avoiding past difficulties in modeling anadromous fish on the Sacramento River, in identifying limitations of past modeling efforts and in refining assumptions for SALMOD.

Analysis of water temperature changes related to the Project will be important. The Nature Conservancy's Indicators of Hydrologic Alteration tool (IHA) (Richter, et al., 1996) could be used to assess the effects of changes either toward or away from unimpaired flow conditions. In 2001, the DWR, Northern District, initiated work as part of the Integrated Storage Investigation. To perform the required tasks, it was necessary to establish baseline conditions to provide a context for future analysis. DWR used the IHA methodology to establish a baseline for determining potential alterations caused by an offstream storage reservoir. The analysis and data files (on CD-ROM) are available at the DWR, Northern District office. The DWR contact is Stacy Cepello at (530) 529-7352 or cepello@water.ca.gov.

The DFG recommends that the SALMOD model be validated wherever possible. Model limitations should be stated very clearly. An adaptive management program should be developed that identifies key uncertainties in the major model assumptions. Hypotheses should be prepared for those assumptions, and then experiments developed to test the model. Based upon experiment results, model assumptions should be changed and retested. This concludes our initial comments on SALMOD and the SLWRI. Should you require further assistance, please contact Patricia Bratcher of my staff at (530) 225-3845 or pbratcher@dfg.ca.gov.

Sincerely,

DONALD B. KOCH
Regional Manager

cc: See Page 11

Use the signed copy

cc: Ms. Diana Jacobs, Deputy Director
Science Advisor
Department of Fish and Game
1416 Ninth Street
Sacramento, CA 95814

Mr. David Zezulak
Central Valley-Bay Delta Branch
Department of Fish and Game
4001 N. Wilson Way
Stockton, CA 95205

Mr. Gary Smith
Ms. Alice Low
Native Anadromous Fish
and Watershed Branch
830 S Street
Sacramento, CA 95814-7023

Messrs. Mark Stopher, Steve Turek,
Neil Manji, Mike Berry, Steve
Baumgartner, and Randal C. Benthin
601 Locust Street
Redding, CA 96001

Ms. Patricia Bratcher
Northern California-North Coast Region
Department of Fish and Game
601 Locust Street
Redding, CA 96001

Mr. Steven Detwiler
U.S. Fish and Wildlife Service
2800 Cottage Way
Sacramento, CA 95825

Mr. John Bartholow
U.S. Geological Survey
Fort Collins Science Center
2150 Centre Ave., Bldg C
Fort Collins, CO 80526-8118

Ms. Donna Garcia
U.S. Bureau of Reclamation
2800 Cottage Way, MP-700
Sacramento, CA 95825-1898

References:

Bartholow, J.M. 2004. Modeling Chinook salmon with SALMOD on the Sacramento River, California. Hydrecol. Appl. 14(1): 193-219.

Bartholow, J.M. 2003. Modeling Chinook salmon with SALMOD on the Sacramento River, California. International IFIM Users' Workshop. 1-5 June 2003. Fort Collins, CO.

Bartholow, J., J. Sandelin, B.A.K. Coughlan, J. Laake, and A. Moos. 1997. SALMOD: A Population Model for Salmonids: User's Manual. Version 2.0. USGS Internal Publication. 89 pp. Also available over the Internet at http://www.fort.usgs.gov/.

Biosystems, Inc. 1991. Hydrologic and fall-run Chinook salmon population dynamics assessment for the evaluation of economic impacts of alternatives for designation of winter-run Chinook critical habitat in the Sacramento River. Prepared for E.G&G. Washington Analytical Services Center, Inc. under Contract to National Marine Fisheries Service.

California Department of Fish & Game. 2005. California Department of Fish and Game Code. Addenda attached. 497 pp.

California Resources Agency. 1989. Upper Sacramento River Fisheries and Riparian Habitat Management Plan. Prepared for the Resources Agency by an Advisory Council established by SB 1086, authored by Senator Jim Nielson. 165 pp.

California State Lands Commission. 1993. California's Rivers—A Public Trust Report. Contributors: D. Jacobs and E. Chatfield. 334 pp.

Gaines, P.D., and W.R. Poytress. 2003. Brood-year 2002 winter Chinook juvenile production indices with comparisons to adult escapement. Report of U.S. Fish and Wildlife Service to California Bay-Delta Authority, San Francisco, CA.

(in press, DRAFT) T.S. Hardin, R.T Grost,. M.B. Ward,. and G.E. Smith. 2005. Habitat suitability criteria for anadromous salmonids in the Klamath River, Iron Gate Dam to Scott River, California. Department of Fish and Game Stream Evaluation Report Number 05-1. 76 pp.

Killam, D. and C.H. Arrison. 2005. Chinook salmon populations for the upper Sacramento River System, 2004. Sacramento River Salmon and Steelhead Assessment Project, California Department of Fish & Game, SRSSAP Technical Report No. 05-2 2005. 32 p.

References continued:

Maslin, P.E., W.R.McKinney, and T.L. Moore. 1996. Intermittent Streams as Rearing Habitat for Sacramento River Chinook Salmon. (1997 and 1998 updates also available). Prepared for U.S. Fish and Wildlife Service, Anadromous Fish Restoration Program. Unk pp.

Richter, B., J.V. Baumgartner, J. Powell, and D. Braun. 1996 (note—model has been updated recently). A Method for Assessing Hydrologic Alteration within Ecosystems. Conservation Biology, Volume 10, No. 1. August 14, 1996.

Sacramento River Advisory Council, c/o California Department of Water Resources. 2000. Sacramento River Conservation Area Handbook. Prepared for the Resources Agency, State of California, under Senate Bill 1086, authored by Senator Jim Nielson. Unk pp.

Smith, G. 2005. Personal communication to Patricia Bratcher, Staff Environmental Scientists, California Department of Fish and Game. October, 2005. Redding, CA.

Stalnaker, C.B., B.L. Lamb, J. Henriksen, K. Bovee, and J. Bartholow. 1995. The Instream Flow Incremental Methodology: A Primer for IFIM. Washington, D.C.: U.S. Geological Survey. Biological Report 29: 45 p.

State Water Resources Control Board. 2000. Revised Decision 1641. Decision Implementing Flow Objectives For The Bay-Delta Estuary, Approving A Petition To Change Points Of Diversion Of The Central Valley Project And The State Water Project In The Southern Delta, And Approving A Petition To Change Places Of Use And Purposes Of Use Of The Central Valley Project, December 29, 1999. Revised In Accordance With Order Wr 2000-02 On March 15, 2000.

USBR. 1991. Planning report/final environmental statement, Shasta outflow temperature control. Shasta County, California.

U.S. Fish and Wildlife Service 2001 (Final). Final Restoration Plan for the Anadromous Fish Restoration Program. A Plan To Increase Natural Production Of Anadromous Fish In The Central Valley Of California. Prepared For The Secretary Of The Interior By The United States Fish And Wildlife Service With Assistance From The Anadromous Fish Restoration Program Core Group under Authority Of The Central Valley Project Improvement Act. Released As A Revised Draft On May 30, 1997, And Adopted As Final On January 9, 2001.

References continued:

U.S. Fish and Wildlife Service. 1999. Effect of temperature on early-life survival of Sacramento River fall- and winter-run Chinook salmon. USFWS Report, Northern Central Valley Fish and Wildlife Office Red Bluff, California. 41pp.

U.S. Fish and Wildlife Service. 1995. Working Paper on restoration needs: Habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volume 3. May 9, 1995. Prepared for the U.S. Fish and Wildlife Service under the direction of the Anadromous Fish Restoration Program Core Group. Stockton, CA.

U.S. Fish and Wildlife Service. 1990. Assumptions for Application to a Temperature Mortality Model for Chinook Salmon of the Sacramento River. Prepared for the Bureau of Reclamation by the U.S. Fish and Wildlife Service and the California Department of Fish and Game. USFWS Sacramento Field Office. January 1990. 14 pp.

Warner, R.E., and K.M. Hendrix. 1985. Riparian Resources of the Central Valley and California Desert. A report on their nature, history, and Status with Recommendations for their Revitalization and Management. Prepared for the California Department of Fish and Game. Unk. Pp.

Responses to Comments from Natural Resources Defense Council

NRDC4-1: Please refer to Master Comment Response NEPA-1, "Sufficiency of the EIS," Master Comment Response CR-1, "Potential Effects to Cultural Resources," Master Comment Response CR-11, "Cultural Resources and NEPA," and Master Comment Response EI-1, "Intent of NEPA Process is to Provide Fair and Full Discussion of Significant Environmental Impacts."

NRDC4-2: Please refer to Master Comment Response CR-1, "Potential Effects to Cultural Resources."

NRDC4-3: The Commenter is incorrect. Analysis for the DEIS relied on the updated USFWS 2008 Revised Biological Opinion on the Coordinated Operations of the Central Valley Project and State Water Project in California. (USFWS 2008) and the NMFS 2009 Revised Biological Opinion on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (NMFS 2009).

Please refer to Master Comment Response ESA-1, "Compliance with the Endangered Species Act," and Master Comment Response DSFISH-4, "Maintaining Sacramento River Flows to Meet Fish Needs and Regulatory Requirements."

NRDC4-4: The Commenter is incorrect and reviewed a previous version of the EIS. Analysis for the DEIS relied on the updated USFWS 2008 Revised Biological Opinion on the Coordinated Operations of the Central Valley Project and State Water Project in California. (USFWS 2008) and the NMFS 2009 Revised Biological Opinion on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (NMFS 2009).

Please refer to Master Comment Response ESA-1, "Compliance with the Endangered Species Act," and Master Comment Response DSFISH-4, "Maintaining Sacramento River Flows to Meet Fish Needs and Regulatory Requirements."

NRDC4-5: As stated in Chapter 1, "Introduction," the Final EIS is being published along with the Final Feasibility Report. The Final Feasibility Report incorporates information contained in the Final EIS by reference, and will be used to determine the type and extent of Federal interest in enlarging Shasta Dam and Reservoir. The Final EIS and the Final Feasibility Report will be used together to support the Federal decision. Analysis for the DEIS relied on the updated USFWS 2008 Revised Biological Opinion on the Coordinated Operations of the Central Valley Project and State Water Project in California. (USFWS 2008) and the NMFS 2009 Revised Biological Opinion on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (NMFS 2009).

The feasibility report has been updated to reflect the USFWS and NMFS 2008 and 2009 BOs.

As described in DEIS Chapter 5, "Air Quality and Climate," Section 5.2, "Regulatory Framework," CEQ issued guidance on including GHG emissions and climate change impacts in environmental review documents under NEPA. CEQ's guidance (issued February 18, 2010) suggests that Federal agencies "consider opportunities to reduce GHG emissions caused by proposed Federal actions, adapt their actions to climate change impacts throughout the NEPA process, and address these issues in their agency NEPA procedures." The following are the two main factors to consider when addressing climate change in environmental documentation:

- The effects of a proposed action and alternative actions on GHG emissions

- The impacts of climate change on a proposed action or alternatives

Effects of the no-action and action alternatives on GHG emissions are discussed in Chapter 5, "Air Quality and Climate," Section 5.3, "Environmental Consequences and Mitigation Measures."

Cumulative effects of climate change on resource areas are discussed in the "Cumulative Effects" sections in each of the resource section chapters of the DEIS. In addition, The Climate Change Modeling Appendix provides an assessment of the potential to achieve the objectives of the SLWRI under projected future climate change. (See Master Comment Response CC-1 for a description of the differences between the Appendix and the information used in the DEIS chapters).

Because of the very uncertainty related to how global climate change will impact runoff and water temperatures at a regional or local scale, the quantitative analysis of future operational scenarios becomes speculative and must, by nature incorporate a number of scenarios, each of which may be more or less likely than other scenarios. Reclamation used the best available information and science in developing Chapter 5, "Air Quality and Climate," and the Climate Change Modeling Appendix.

Please refer to Master Comment Response CC-1, "Climate Change Uncertainty and Related Evaluations, "Master Comment Response NEPA-1, "Sufficiency of the EIS," and Master Comment Response NEPA-2, "Cumulative Impacts."

NRDC4-6: The Commenter is incorrect and reviewed a previous version of the EIS. Analysis for the DEIS relied on the updated USFWS 2008 Revised Biological Opinion on the Coordinated Operations of the Central Valley Project and State Water Project in California. (USFWS 2008) and the NMFS 2009 Revised Biological Opinion on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (NMFS 2009).

NRDC4-7: As stated in Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.3, "Direct and Indirect Effects," "An increase in Delta outflow of 200 to 300 cfs during dry or critical water years would not result in significant impacts to Delta fisheries, particularly at flows between 3,500 and 6,000, while a decrease in Delta outflow in November by around 700 cfs when outflows are higher in November would also not result in significant impacts to Delta fisheries."

While Delta outflow criteria for delta and longfin smelt, as identified in the cited report provided by the commenter are not always met, they are

not met under the baseline conditions (Existing Conditions and No-Action Alternative). Green sturgeon were not listed in Table 2. Species of Importance, and on page 53 of the report, it states: "No specific Delta outflow requirements are recommended for Chinook salmon."

NRDC4-8: Please refer to Master Comment Response WASR-1, "Eligibility of the McCloud River as a Federal Wild and Scenic River," and Master Comment Response WASR-6, "Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542."

NRDC4-9: This comment appears to be related to the Draft Feasibility Report, not the DEIS, which is the subject of these responses. To provide information related to this topic, please refer to DEIS Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.2.3, "Methods and Assumptions," and Chapter 2, "Alternatives," Section 2.1.6, "Development and Refinement of Comprehensive Plans." As described in the DEIS, legal challenges resulted in uncertainty regarding operational constraints for the CVP and SWP. As a result, evaluations in the Preliminary DEIS, and correspondingly the Draft Feasibility Report, which were both released to the public in February 2012, were based on available modeling and analysis at that time. This modeling and analysis reflected operations described in the 2004 OCAP BA and the Coordinated Operations Agreement between Reclamation and DWR for the CVP and SWP. These analyses were suitable for comparison purposes, and reflected expected variation among the alternatives, including the type and relative magnitude of anticipated impacts and benefits.

As described in the DEIS Chapter 3, Section 3.2.3, and Chapter 2, Section 2.1.6, subsequent to the release of the Draft Feasibility Report, the SLWRI action alternatives were further refined based on several factors, including updates to CVP and SWP operational assumptions and stakeholder input. Water operations modeling and related evaluations for the DEIS were updated to reflect the 2008 Long-Term Operation BA, 2008 USFWS BO, 2009 NMFS BO, and additional changes in CVP and SWP facilities and operations, such as implementation of the San Joaquin River Restoration Program. Evaluations in the Final Feasibility Report, including cost-benefit analyses for all comprehensive plans, were updated based on alternatives refinements and updated CVP and SWP operational assumptions included in the DEIS, including the 2008 Long-Term Operation BA, 2008 USFWS BO, and 2009 NMFS BO.

Please refer to Master Comment Response COST/BEN-2, "Comments Related to the SLWRI Feasibility Report."

NRDC4-10: This comment appears to be related to the Draft Feasibility Report, not the DEIS, which is the subject of these responses. Please see response for NRDC4-9 related to the cost-benefit analyses for action alternatives and related operational scenarios. Effects to fish and wildlife, both adverse and beneficial, are evaluated in EIS Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.3, "Direct and Indirect Effects," and EIS Chapter 13, "Wildlife Resources," Section 13.3.4, "Direct and Indirect Effects."

Please refer to Master Comment Response COST/BEN-2, "Comments Related to the SLWRI Feasibility Report."

NRDC4-11: Per, NEPA 40 CFR Section 1502.23, "…the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are important qualitative considerations." Accordingly, a cost-benefit analysis was not included in the DEIS. A preliminary cost-benefit analysis was included in the SLWRI Draft Feasibility Report, which was released to the public in February 2012. Estimated costs and benefits of action alternatives presented in the Draft Feasibility Report were determined by comparison of the with-project (action alternative) and without-project (No-Action Alternative) conditions, consistent with the Federal planning process identified in the U.S. Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G). Evaluations in the SLWRI Final Feasibility Report, including economic feasibility evaluations, were updated based on alternatives refinements and updated CVP and SWP operational assumptions included in the SLWRI DEIS, including the 2008 Long-Term Operation BA, 2008 USFWS BO, and 2009 NMFS BO.

According to NEPA requirements, potential effects to the Delta ecosystem are evaluated in the EIS in Chapter 7, "Water Quality," Chapter 11, "Fisheries and Aquatic Ecosystems, Chapter 12, "Botanical Resources and Wetlands," and Chapter 13, "Wildlife Resources." Potential effects to wild and scenic resources of the McCloud River are evaluated in DEIS Chapter 25, "Wild and Scenic River Considerations for McCloud River."

Please refer to Master Comment Response COST/BEN-2, "Comments Related to the SLWRI Feasibility Report," and Master Comment Response CR-1, "Potential Effects to Cultural Resources."

33.10.27 Northstate Women's Health Network

PUBLIC COMMENT CARD

Name: Joy L. Newcom-Wade RN, FNP, PA
Organization: Northstate ♀ Health Network
Address: 3702 Fujiyama Way
V.P. Board of Directors
Email:
Written (NWHN1-1

The Water Education Foundation, W.H.O, B.I.A, and Nobel Prize economist, E.F. Schumacher Small Is Beautiful and The World Policy Institute ALL believe taking out dams, replumbing, filtering, conserving separating, Terraceing & and beautification projects are MORE NECESSARY and MORE COST-EFFECTIVE than HUGE, NOISE-POLLUTING, AIR-POLLUTING, EARTH DESTROYING DESERTIFICATION projects whose so-called "irrigation" has led to deforestation, air-pollution, pesticides, G.M.O.'s, global warming and UNSUSTAINABILITY. Build dam-raising where water-torrents warrant it — NOT where NO ONE WANTS or NEEDS IT.

NWHN1-2 Sierra Pacific Industries cogeneration PLUS solar, wind, hydro-fuel could fuel the DESALINATION PLANT in SAND, CA.

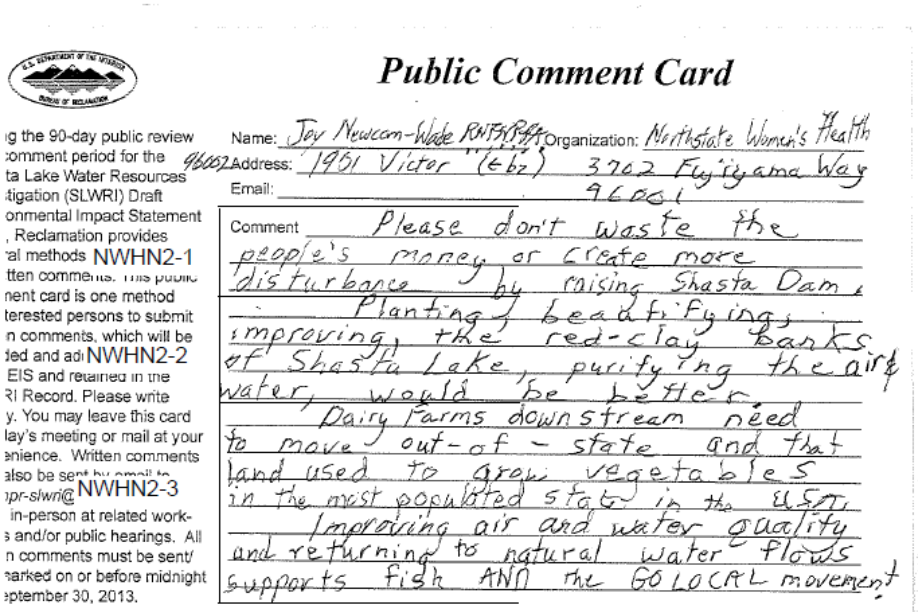
Responses to Comments from Northstate Women's Health Network

NWHN-1: Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," Master Comment Response ALTD-2, "Alternative Development- Anadromous Fish Survival," and Master Comment Response ALTR-1, "Range of Alternatives General."

NWHN-2: Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," and Master Comment Response ALTR-1, "Range of Alternatives General."

33.10.28 Northstate Women's Health Network

NWHN2



Public Comment Card

...g the 90-day public review ...comment period for the ...ta Lake Water Resources ...tigation (SLWRI) Draft ...onmental Impact Statement ..., Reclamation provides ...al methods NWHN2-1 ...tten comments. This public ...nent card is one method ...terested persons to submit ...n comments, which will be ...ded and adi NWHN2-2 ...EIS and retained in the ...RI Record. Please write ...y. You may leave this card ...lay's meeting or mail at your ...enience. Written comments ...also be sent by email to ...pr-slwri@ NWHN2-3 ...in-person at related work- ...s and/or public hearings. All ...n comments must be sent/ ...marked on or before midnight ...eptember 30, 2013.

Name: Joy Newcom-Wade RN FNP-BC Organization: Northstate Women's Health
Address: 1951 Victor (Ebz) 3702 Fujiyama Way 96002 96001
Email:

Comment: Please don't waste the people's money or create more disturbance by raising Shasta Dam. Planting, beautifying, improving the red-clay banks of Shasta Lake, purifying the air & water, would be better. Dairy farms downstream need to move out-of-state and that land used to grow vegetables in the most populated state in the U.S.A. Improving air and water quality and returning to natural water flows supports fish AND the GO LOCAL movement

Responses to Comments from Northstate Women's Health Network

NWHN2-1: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

NWHN2-2: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

NWHN2-3: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

33.10.29 Pacific Forest Trust

PACIFIC FOREST TRUST

california water impact network

Katrina Chow, Project Manager
United States Department of the Interior
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way, MP-700
Sacramento, CA 95825-1893

Copy sent via email to: BOR-MPR-SLWRI@usbr.gov

September 30th 2013

Dear Ms. Chow,

PFT1-1

The undersigned organizations thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) recently published as part of the Shasta Lake Water Resources Investigation (SLWRI). We are active members of the Shasta Lake watershed community and have a significant interest in the outcomes of the SLWRI.

We are opposed to the proposals outlined in the DEIS to raise the Shasta Dam. Our opposition is centered on the Bureau of Reclamation's failure to address broader watershed conservation in the DEIS. A single-minded focus on raising the height of Shasta Dam without working to conserve and protect the landscape that supplies water to Shasta Lake is short-sighted. The watershed as a whole is the true reservoir – Shasta Lake is only its most visible manifestation. By failing to conserve the broader watershed in any way, the Bureau is endangering the source of the water that it covets.

Thank you again for the opportunity to comment on the DEIS.

Sincerely,

Patrick Doherty
Policy Associate
Pacific Forest Trust
1001-A O'Reilly Ave.
San Francisco, CA 94129
e-mail: pdoherty@pacificforest.org

Carolee Krieger
President and Executive Director
California Water Impact Network
808 Romero Canyon Road
Santa Barbara, CA 93108
e-mail: caroleekrieger7@gmail.com

Responses to Comments from Pacific Forest Trust

PFT1-1: Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," Master Comment Response P&N-1, "Purpose and Need and Objectives," and Master

Comment Response EI-1, "Intent of NEPA Process to Provide Fair and Full Discussion of Significant Environmental Impacts."

33.10.30 Pacific Forest Trust

PFT2

PACIFIC FOREST TRUST

Katrina Chow, Project Manager
United States Department of the Interior
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way, MP-700
Sacramento, CA 95825-1893

Copy sent via email to: BOR-MPR-SLWRI@usbr.gov

September 30th 2013

Dear Ms. Chow,

PFT2-1 Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) recently published as part of the Shasta Lake Water Resources Investigation (SLWRI). The Pacific Forest Trust (PFT) holds several large conservation easements in the Shasta region, and is the convener of the Klamath-Cascade Advisory Council – a local group of stakeholders interested in economic development and forest health in the Shasta region. As a result, PFT has interests in the region that are directly affected by the SLWRI and the proposal to raise the Shasta Dam (the proposal).

PFT2-2 Overall, PFT believes that all five of the proposal's action options are anachronistic and their analysis wholly inadequate. While the original Shasta Dam may have been an appropriate way to address flood control, water storage and electricity generation, the 21st century introduces new challenges with respect to climate change and water security, and consequently new solutions are required.

PFT2-3 The Bureau of Reclamation (the Bureau) should not spend billions of dollars to raise the Shasta Dam, while simultaneously ignoring more cost-effective means of increasing water security and regulating water supply. Modest investments in forest conservation and wet meadow restoration in the upper watersheds of Shasta Lake would be a more efficient and more flexible investment, especially in the face of uncertain changes to our environment.

PFT2-4 PFT opposes the proposal and the five action options considered by the DEIS for implementing it. The reasons for our opposition are:

- The proposal is illegal in its effects by interfering with the free-flowing conditions of the McCloud River.

PFT2-5
- The proposal's process is illegal, as it requires collaboration with state agencies that is prohibited by law.

PACIFIC FOREST TRUST
Private Forests, Public Treasures

PFT2-6
- The rationale for the proposal is hollow as the action options will not reduce expected unfulfilled CVP contractual obligations, making the high cost of the proposal unjustifiable.

PFT2-7
- The current full pool of Shasta Lake is rarely reached, which suggests that projections of future full pool levels will be rarely reached as well.

PFT2-8
- The DEIS does not consider a preferred alternative encompassing forest conservation and restoration activities.

PFT2-9
Further, PFT finds that the DEIS fails to analyze the range of alternatives fully as the DEIS:

- Fails to consider in any form the value of forest conservation and wet meadow restoration projects and their ability to increase water security and supply for Shasta Lake.

PFT2-10
- Fails to account for greenhouse gas (GHG) emissions from flooded vegetation, cement manufacture and decay, and foregone sequestration.

PFT2-11
- Fails to consider the overall policy landscape for renewable energy in California, and therefore significantly overestimates the GHG emission mitigations that will result from increased hydroelectric power generation.

PFT2-12
General Comments

As noted by the SLWRI's Draft Feasibility Report (DFR), the total increase in demand for water in California by 2050 is expected to range between -1.5 to 8 million acre-feet (MAF), depending on the model of population growth used. However, when one looks at those numbers broken down by sector it becomes apparent that none of the increase in demand by 2050 is expected to come from the agricultural sector. Under all of the growth scenarios cited by the DFR, the agricultural sector is expected to consume less water in 2050 compared to the present day.

The Shasta Dam, as the largest reservoir serving the Central Valley Project (CVP), supplies water mainly to the CVP and its contractors. As you are well aware, the vast majority of CVP water is used by the agricultural sector. According to the Bureau's own record of CVP contractors as at February 22nd 2012, the agricultural sector is allocated 87% of the CVP's water service supplies.

2

PACIFIC FOREST TRUST

PFT2-12 CONTD

While it may be that current CVP contractual obligations go unfulfilled, it does not follow that raising the Shasta Dam will satisfy those unmet obligations. The DEIS notes that under various projections of the impacts of climate change, the reduction in unmet demand to CVP contractors will be small (DEIS Climate Change Modeling Appendix (CCMA), page 3-114). Given that the annual unmet CVP obligations under various climate models are expected to range from 2.7 to 8.2 MAF per year (CCMA, p. 3-73), the expected reduction in unmet demand for CVP contractors is, literally, a drop in the bucket.

Therefore, an argument to raise the Shasta Dam premised on the need to secure a greater supply of water for CVP contractors is fundamentally flawed. The vast majority of water that the CVP is contracted to supply is owed to a sector that is not projected to require more water in the future than it does today, and the DEIS CCMA makes clear that whatever new storage is created will likely be inconsequential to expected unmet contractual obligations.

Given that the underlying rationale for the project is hollow, any significant cost for the project would be a waste of financing. The DEIS's estimated costs for the proposal to raise the dam are enormous. Each of the five different action options for raising Shasta Dam is expected to cost approximately $1 billion merely for construction. Once ongoing costs are added, the total cost for the action options range from $4.2 billion to $5.4 billion.

PFT2-13

It truly stretches credibility to argue that federal taxpayers, state taxpayers, and CVP contractors should be expected to pay these gigantic sums for CVP water storage where there is no projected increase in demand for the agricultural sector, and where any new storage created will likely not affect expected unmet obligations. While there may be some agricultural CVP contractors "at the back of the line" for water distributions that desire to see the dam raised, their particular interests should not be used to justify such enormous expenditures and unavoidable environmental degradation.

Significant and Unavoidable Impacts on the Free-Flowing Conditions of the McCloud River

PFT2-14

In general, PFT opposes the proposal to raise the Shasta Dam on the grounds that it will negatively affect the free-flowing conditions of the McCloud River. As noted by the DEIS, the free-flowing conditions of the McCloud River are protected by state law, and these conditions would be negatively impacted by all five of the proposal's action options.

PACIFIC FOREST TRUST

PFT2-14 CONTD

While PFT appreciates that the DEIS is forthright enough to admit to the proposal would violate state law protecting the free-flowing conditions of the McCloud River, PFT is deeply concerned that despite this acknowledgement, there appears to be no mitigation proposed for these effects on the McCloud River. Rather, they are identified as "significant and unavoidable" impacts on page ES-123 of the DEIS.

It may be stating the obvious, but if the Bureau cannot mitigate or otherwise resolve impacts that make the proposal illegal, then the Bureau should not pursue the proposal. This is because executive agencies are entrusted with enforcing the law of the land. It is a fundamental premise of our system of government that the executive is not allowed to break the law. Therefore, PFT urges the Bureau to cease work on a proposal that it has identified as being plainly illegal in its effects.

Illegality of the Process as it Relates to State Agencies

Of the several unresolved issues noted on pages ES-29 to ES-32 of the DEIS, one of the most striking is the fact that cooperation on the Shasta Dam proposal between state agencies and the Bureau is likely illegal. This is because state law generally prohibits California state agencies from working with federal agencies on proposals that would have an adverse effect on the free-flowing conditions of the McCloud River – which is exactly what the proposal would do.[1]

PFT2-15

PFT urges the Bureau to discontinue its efforts to coordinate with state agencies on this proposal. This includes efforts that seek or otherwise result in permits or approvals for the proposal required by applicable law. Should the Bureau continue to attempt to coordinate with state agencies as a part of this process, PFT will urge the Attorney General of the state of California to prevent the Bureau from working with state agencies on the proposal.

Given that the DEIS identifies the likely illegality of working with state agencies on this proposal, PFT is dismayed that the Bureau would continue working through a process – including the preparation of the DEIS itself – that appears to be plainly illegal. It suggests that the Bureau values the desired outcomes of the project more than the law itself, which is a dangerous position for any executive agency entrusted with enforcement of the law to take.

Low Likelihood of Attainment Maximum Water Storage Under Any Option

PFT2-16

Each of the five action options for raising Shasta Dam in the DEIS would result in large increases to the total maximum potential water storage (aka "full pool") for Shasta Lake, ranging from 256,000 to 634,000 acre-feet. However, as noted by the

PFT2-15 CONTD

[1] Our comments on this issue do not relate to the participation of the Department of Water Resources in studies involving the technical and economic feasibility of enlargement of Shasta Dam, which is

PACIFIC FOREST TRUST
Private Forests, Public Treasures

DFS, the *current* full pool is rarely reached. The figure on page 2-26 of the DFS suggests that full pool has been reached only once since 1999.

PFT2-16 CONTD

Given that the current full pool of Shasta Lake is only rarely reached, PFT does not believe there is a strong rationale for expanding the potential full pool. Shasta Dam currently fulfills its flood protection duties, and as noted above demand for water from the agricultural sector is expected to decrease by 2050. As a result, there does not appear to be a compelling need to cause widespread environmental harm and incur billions of dollars in costs.

PFT2-17

While the DFS argues that increased surface storage is necessary given variability in California's precipitation and water usage patterns (see, eg, page 2-9), this argument fails to account for finite limits on precipitation to be expected in California in the future. In essence, building a bigger dam will not make more rain or snow fall, and as a result the shortage of supply that is highlighted by the DFS and DEIS as a rationale for the proposal will not be truly addressed. Below, we point out that modest investments in the upper watersheds of Shasta Lake can actually increase water security while not requiring an increase in the dam's height.

No Consideration of the Value of Green Infrastructure

While the Bureau insists that increasing the height of the Shasta Dam is essential for flood management and water supply in the face of climate change, the reality is that investments in upper watershed forest conservation and restoration – an example of so-called "green infrastructure" – can provide a more cost-effective means of meeting this goal.

PFT2-18

Forest conservation is a practical and cost-effective means of ensuring the security and quality of large watersheds. Conservation reduces fragmentation of forested landscapes and enhances forest cover structure. This not only assists with water security, but it also provides significant co-benefits for wildlife. Forest conservation is also a proven tool in this context. A famous example is the conservation of forestland in New York's Catskill Mountains by New York City, to ensure a high level of water quality and security for the city's public water system. Widespread use of conservation easements on forestland in the Catskills was found to be extremely cost-effective, and saved New York City billions of dollars that would have otherwise been spent on manmade water treatment facilities.

PFT2-19

As a complement to forest conservation, restoring wet meadows within forests can increase water storage, reduce winter flood flows, and make more water available later in the year when competing demands are at their peak. Forest restoration

PACIFIC FOREST TRUST

PFT2-19 CONTD

projects that reduce over-stocked stands can also increase surface snowpack during the winter and reduce the amount of biological uptake of water.

PFT2-20

The absence of such modest investment options from the DEIS is striking. PFT recommends that the Bureau include a preferred option that focuses on green infrastructure investments that will enhance the ability of the forests of the upper watersheds to filter, regulate and increase water supplies to Shasta Lake. These sensible investments can provide proven economic benefits to downstream users of Shasta Lake waters, and they would likely result in greater benefits for a greater number of stakeholders than simply raising the height of the dam.

Accounting of Greenhouse Gas Emissions

PFT2-21

Page 5-43 of the DEIS laudably states that careful accounting of GHG emissions from vegetation loss is conducted "to ensure that underestimating would not occur." Unfortunately, the spirit of this pledge is not reflected in the overall GHG accounting provided by the DEIS. Instead, the DEIS ignores significant sources of GHG emissions arising from the proposal's five action options, including:

- GHG emissions from flooded, decomposing vegetation.
- GHG emissions from foregone sequestration.
- GHG emissions from cement manufacture and decay.

Perhaps most striking is the DEIS's statement on page 5-45 that increases in GHG emissions from foregone sequestration and decomposing organic matter are "speculative and infeasible to calculate at this time." This is simply not true, as illustrated below.

For GHG emissions from flooded and decomposing vegetation, it is possible to estimate these – particularly as it pertains to methane in the hydroelectric generation context. As noted by the DEIS, methane is a potent GHG. As noted by PFT in our comments on the DFS, methane emissions are a primary reason why hydroelectric power generation should not be considered GHG beneficial. We repeat our previous comments on the DFS, and remind the Bureau that:

> Hydroelectric facilities are not as green as they first appear, particularly when the release of methane from anaerobically digested plant matter is taken into account. We note that a study publicized last year by researchers at Washington State University found that methane emissions jumped 20-fold when the water level was drawn down at Lacamas Lake in Clark County, Washington after analyzing dissolved gases in the lake.

PACIFIC FOREST TRUST
Private Forests, Public Treasures

The researchers also sampled bubbles rising from the lake mud and measured a 36-fold increase in methane during a drawdown.

PFT is disappointed that despite bringing the issue of GHG emissions from anaerobic digestion of plant material to the attention of the Bureau in March, this source of GHG emissions is not considered in the DEIS. We repeat our comment that the GHG emissions of the proposal's five action options cannot be considered complete unless such an analysis occurs.

With respect to foregone sequestration benefits from flooded vegetation, the EPA's publicly available Greenhouse Gas Equivalencies Calculator (available at http://www.epa.gov/cleanenergy/energy-resources/calculator.html), clearly refers to a metric for calculating foregone sequestration per acre of converted forestland. It is strange, then, that the DEIS would claim that such a calculation is speculative and infeasible.

PFT2-21 CONTD

Page 10-17 of the DEIS (Table 10-4) estimates that a maximum of 4,675 acres of forestland will be lost as a result of the proposal. Using the EPA's public calculator of forest sequestration potential, this means that a maximum of 5,704 metric tons of potential annual CO_2e sequestration will be eliminated by the proposal.[2]

Over the lifetime of the project (assuming 100 years), this amounts to 570,400 metric tons of lost CO_2e sequestration. Not accounting for such a large source of GHG emissions – and foregone sequestration is a GHG source – demonstrates that the DEIS does not accurately describe the GHG emissions that would result from the proposal. Consequently, the DEIS's finding that the proposal's GHG emissions are "less than significant" is unfounded.

Not accounting for the contribution of cement manufacture and decomposition to the GHG emissions of the proposal also contradicts established mechanisms for GHG accounting. Cement manufacture is well known as a particularly GHG-intensive industry. The California Air Resources Board (ARB) estimated that in 2011 California cement plants emitted 6.14 million metric tons of CO_2e. This is roughly equivalent to the emissions required to provide electricity to over 900,000 average American homes.[3]

PFT2-22

[2] This number is probably an underestimate as the EPA's calculator uses an average for forests nationwide – the forests of northern California are very productive and sequester larger amounts of carbon per acre than the national average.

[3] Using the EPA's greenhouse gas equivalency calculator available at: http://www.epa.gov/cleanenergy/energy-resources/calculator.html.

PFT2-21 CONTD

PFT2-22 CONTD

7

PFT2-22 CONTD

Given that such a large contribution to GHG emissions occurs when cement is manufactured, to say nothing of the GHG emitted as concrete decomposes, the DEIS must account for these emissions. The failure to do so is glaring, and must be corrected in order for the DEIS to credibly claim that it accounts for the GHG emissions of the proposal.

PFT2-23

With respect to the DEIS's general finding that GHG emissions from the proposal are expected to be "less than significant," this finding appears to be based primarily on the assumption that increased hydroelectric power output will offset GHG emissions from electricity created by fossil fuels. This finding relies on two assumptions that are flawed:

- That there will be increased water supply (until 2030) to power at least 2.7GWh of increased hydroelectric generation.
- That but for the raising of the Shasta Dam, fossil fuel generation of at least 2.7GWh would occur.

As noted by the DEIS, "future conditions" will not be as favorable to increased water supply for hydroelectric power generation. One of the many expected impacts of climate change is a greater variability in precipitation and, consequently, water supply to Shasta Lake. As noted in our comments above concerning green infrastructure, the Bureau is missing an opportunity to secure clean and dependable increases in water supply by failing to include forest and wet meadow restoration in the upper watersheds as part of its proposal for Shasta Dam.

The result of this increased variability is that it is simply not certain that increased water supply – even to 2030 – would be available to generate at least 2.7GWh of increased hydroelectric power. Therefore, the DEIS should not assume that such a large increase in power could be generated annually to 2030.

PFT2-24

The second flawed assumption of the DEIS is that but for the raising of the Shasta Dam and the generation of increased hydroelectric power, such power would be sourced from fossil fuels. There is simply no reason to make this assumption.

PFT2-25

California law requires that 33% of the state's electricity be generated by renewable sources by 2020. This is known as the renewable portfolio standard (RPS). Between the three largest utilities in California, only about 20% of power is currently sourced from renewable sources.[4] This means that California's three main utilities must increase their supply of renewable power by around 50% over the

[4] Please see http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm.

8

PFT2-25 CONTD

next seven years to comply with the RPS. This is an ambitious target that means renewable power will be in high demand.

PFT2-26

Any new hydroelectric generation that would be provided by the proposal would almost certainly be used by utilities to meet their goal under the RPS, as hydroelectric power qualifies as renewable energy. Simply put, it is infeasible that a California utility would source fossil fuel power to replace foregone hydroelectric power. In order to meet the requirement of the RPS, a utility would need to source that power from another renewable source – such as solar or wind.

Given that the water supply for the additional hydroelectric power is unreliable, and given that the additional hydroelectric power would almost certainly not be alternatively supplied by fossil fuels, the DEIS's finding that the GHG emissions from all five action options are less than significant is incorrect. In light of this, the Bureau should reevaluate the potential GHG emissions of the proposal and grant that the impacts will actually be significant and in need of mitigation.

Conclusion

PFT2-27

PFT opposes the proposal and the five action options considered by the DEIS for implementing it. The reasons for our opposition are:

- The proposal is illegal in its effects by interfering with the free-flowing conditions of the McCloud River.

PFT2-28

- The proposal's process is illegal, as it requires collaboration with state agencies that is prohibited by law.

PFT2-29

- The rationale for the proposal is hollow as the action options will likely not substantially reduce expected unfulfilled CVP contractual obligations, making the high cost of the proposal unjustifiable.

PFT2-30

- The current full pool of Shasta Lake is rarely reached, which suggests that projections of future full pool levels will be rarely reached as well.

PFT2-31

- The DEIS does not consider a preferred alternative encompassing forest conservation and restoration activities.

PFT2-32

Further, PFT finds that the DEIS fails to analyze the range of alternatives fully as the DEIS:

PACIFIC FOREST TRUST
Private Forests, Public Treasures

PFT2-32 CONTD
- Fails to consider in any form the value of forest conservation and wet meadow restoration projects and their ability to increase water security and supply for Shasta Lake.

PFT2-33
- Fails to account for GHG emissions from flooded vegetation, cement manufacture and decay, and foregone sequestration.

PFT2-34
- Fails to consider the overall policy landscape for renewable energy in California, and therefore significantly overestimates the proposal's potential mitigation of GHG emissions.

PFT2-35
Due to the DEIS's failure to accurately account for GHG emissions and its overestimate of the benefits of hydroelectric power, the DEIS's finding that the GHG emissions of the proposal are less than significant is incorrect. Failure to address this issue in the final EIS could significantly delay the proposal.

Thank you again for the opportunity to comment on the DEIS. Please contact me if you have any questions about our comments or wish to discuss PFT's concerns in more detail. I can be reached at (415) 561-0700 x39 or by email at pdoherty@pacificforest.org.

Sincerely,

Patrick Doherty
Policy Associate

10

Responses to Comments from Pacific Forest Trust

PFT2-1: Comment Noted.

PFT2-2: Please refer to Master Comment Response ALTR-1, "Range of Alternatives General," and Master Comment Response P&N-1, "Purpose and Need and Objectives."

PFT2-3: Please refer to Master Comment Response P&N-1, "Purpose and Need and Objectives," Master Comment Response ALTD-1, "Alternative Development-Water Supply Reliability," and Master Comment Response EI-1, "Intent of NEPA Process to Provide Fair and Full Discussion of Significant Environmental Impacts."

PFT2-4: Please refer to Master Comment Response WASR-1, "Eligibility of the McCloud River as a Federal Wild and Scenic River," and Master Comment Response WASR-6, "Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542."

PFT2-5: Please refer to Master Comment Response WASR-6, "Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542," and Master Comment Response CEQA-1, "CEQA Compliance."

PFT2-6: Please refer to Master Comment Response COST/BEN-1, "Intent of EIS and Process to Determine Federal Interest," Master Comment Response COST/BEN-3, "Estimated Increased Water Supply Reliability Under Action Alternatives."

PFT2-7: Please refer to Master Comment Response RAH-1, "Available Water to Fill an Enlarged Reservoir."

PFT2-8: Reclamation understands the value of forest conservation and restoration activities for watershed improvements. These types of programs can benefit overall water supply, but were not included as alternatives in the current Feasibility Planning phase of the SLWRI.

Please refer to Master Comment Response P&N-1, "Purpose and Need and Objectives," and Master Comment Response ALTR-1, "Range of Alternatives General."

PFT2-9: Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," and Master Comment Response P&N-1, "Purpose and Need and Objectives."

PFT2-10: The commenter states that the GHG analysis in the DEIS "fails to account for greenhouse gas (GHG) emissions from flooded vegetation, cement manufacture and decay, and foregone sequestration." Please refer to Master Comment Response AQ-3, "Potential for Greenhouse Gas Emissions Generated by the Decomposition of Soil and Vegetative Material in the Expanded Reservoir," regarding the level of GHG emissions associated with the decomposition of vegetation that would be inundated by the expanded reservoir. Please refer to Master Comment Response AQ-4, "Greenhouse Gas Emissions Associated with Cement Production," regarding the level of Greenhouse Gas Emissions

Associated with Cement Production. Please refer to Master Comment Response AQ-2, "Loss of Carbon Sequestration and Carbon Sequestration Potential," regarding the level of GHG emissions from decreased sequestration from vegetation that will be removed from inundated areas.

PFT2-11: The commenter states that the GHG analysis in the DEIS "fails to consider the overall policy landscape for renewable energy in California, and therefore significantly overestimates the GHG emission mitigations that will result from increased hydroelectric power generation." Please refer to Master Comment Response AQ-1, "Offsetting Greenhouse Gas Emissions with Increased Hydropower," regarding the GHG benefits of increased hydropower of the proposed project in the regulator context of AB 32 and the Renewable Electricity Standard.

PFT2-12: Please refer to Master Comment Response ALTD-1 "Alternative Development – Water Supply Reliability."

PFT2-13: Total annual costs for action alternatives are included in Attachment 1, "Cost Estimates for Comprehensive Plans," to the DEIS Engineering Appendix. Operations and maintenance costs are included in total annual cost estimates for SLWRI action alternatives. Annual costs for action alternatives in the DEIS ranged from $44 million per year for CP1 to $61 million per year for CP5.

Predicted changes in agricultural water demand by 2050 in the SLWRI Draft Feasibility Report and DEIS were based on evaluations in DWR's California Water Plan Update 2009. A corresponding discussion of estimated unmet agricultural water demands in the Central Valley through 2050 was not provided in Update 2009, but can be found in DWR's California Water Plan Update 2013. Figure 5-10 in Update 2013 Chapter 5, "Managing an Uncertain Future," shows simulated agricultural supply, demands, and unmet demands in portions of the Central Valley through 2050 for a scenario representing historical supply conditions and current trends for population and urban density. As shown in Figure 5-10 of the California Water Plan Update 2013, although agricultural demands are anticipated to decrease by 2050, evaluations indicate significant unmet agricultural water demands in portions of the Central Valley will persist through 2050.

Please refer to Master Comment Response COST/BEN-1, "Intent of EIS and Process to Determine Federal Interest," Master Comment Response COST/BEN-3, "Estimated Increased Water Supply Reliability Under Action Alternatives," and Master Comment Response WSR-1, "Water Supply Demands, Supplies, and Project Benefits."

PFT2-14: Please refer to Master Comment Response WASR-1, "Eligibility of the McCloud River as a Federal Wild and Scenic River," Master Comment Response WASR-6, "Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542," and Master Comment Response WASR-8, "Effects to the Eligibility of Rivers for Inclusion in the Federal Wild and Scenic River System."

PFT2-15: Please refer to Master Comment Response WASR-6, "Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542."

PFT2-16: The reference to the "figure on page 2-26 of the DFS" appears to be related to the SLWRI Draft Feasibility Report not the DEIS, which is the subject of these responses. To provide information related to Shasta Reservoir water operations, please refer to Chapter 6 of the DEIS, "Hydrology, Hydraulics, and Water Management." It should be noted that the referenced figure also reflects Shasta Reservoir flood control operations. If Shasta Dam was raised, the "Bottom of the Flood Control Space" would also be raised. As described in Master Comment Response RAH-1, "Available Water to Fill an Enlarged Reservoir," flood control releases occur before Shasta Lake is physically full, and are driven by the flood control storage regulatory limitations. An enlarged Shasta Reservoir would allow capture of a portion of these releases due to the larger available usable storage under the flood control storage limits.

Predicted changes in agricultural water demand by 2050 in the SLWRI Draft Feasibility Report and DEIS were based on evaluations in DWR's California Water Plan Update 2009. A corresponding discussion of estimated unmet agricultural water demands in the Central Valley through 2050 was not provided in Update 2009, but can be found in DWR's California Water Plan Update 2013 Public Review Draft. Figures 5-8 and 5-9 in Update 2013 Chapter 5, "Managing an Uncertain Future," show simulated Central Valley agricultural supply, demands, and unmet demands through 2050 for a scenario representing historical supply conditions and current trends for population and urban density. As shown in Figures 5-8 and 5-9, although agricultural demands are anticipated to decrease by 2050, evaluations indicate significant unmet agricultural water demands in the Central Valley will persist through 2050.

Please refer to Master Comment Response RAH-1, "Available Water to Fill an Enlarged Reservoir," and Master Comment Response COST/BEN-1, "Intent of EIS and Process to Determine Federal Interest."

PFT2-17: Please refer to Master Comment Response RAH-1, "Available Water to Fill an Enlarged Reservoir."

PFT2-18: Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," Master Comment Response P&N-1, "Purpose and Need and Objectives," and Master Comment Response GEN-1, "Comment Included as Part of the Record."

PFT2-19: Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," Master Comment Response P&N-1, "Purpose and Need and Objectives," Master Comment Response ALTR-1, "Range of Alternatives General," and Master Comment Response GEN-1 "Comment Included as Part of the Record."

PFT2-20: Please refer to Master Comment Response ALTR-1, "Range of Alternatives General," Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," and Master Comment Response P&N-1, "Purpose and Need and Objectives."

PFT2-21: The commenter disagrees with the DEIS's statement on page 5-45 that it would be speculative and infeasible to quantify the potential for increased GHG emissions due to loss of vegetation presently in the area that would be inundated by the expanded reservoir. Please refer to Master Comment Response AQ-2, "Loss of Carbon Sequestration and Carbon Sequestration Potential."

The commenter also disagrees with the DEIS's statement on page 5-45 that it would be speculative and infeasible to quantify level of increased GHG emissions generated by the decomposition of soil and vegetative material in the expanded reservoir. There is a lack of established methods for estimating GHGs generated by the decomposition of organic material inundated by reservoirs. Please refer to Master Comment Response AQ-3, "Potential for Greenhouse Gas Emissions Generated by the Decomposition of Soil and Vegetative Material in the Expanded Reservoir."

The commenter mentions a single poster presented by a Washington State University doctoral student at the Society for Freshwater Science Annual Meeting in Louisville, Kentucky in 2012 called *Water level drawdown affects methane and nitrous oxide production in a small eutrophic reservoir: Lacamas Lake, Washington* (Deemer *et al.* 2012). However, the comment does not provide evidence to support the idea that the dynamics and GHG pathways in Lacamas Lake are similar to those of Shasta Lake, which is a major dominant factor for applicability. Also, Reclamation and its consultants have not been able to attain the poster presentation despite contacting the lead author. As stated in the

United Nations Educational, Scientific and Cultural Organization and the International Hydropower Association *GHG Measurement Guidelines for Freshwater Reservoirs* (UNESCO and IAH 2010), "factors that result in varied GHG exchanges among reservoirs may include carbon/nutrient loading from the catchment; temperature; oxygen concentration; type and density of the flooded vegetation; aquatic flora and fauna; residence time; wind seed; thermal structure; reservoir topography and shape; and water level." The Guidelines also state, "Most studies of reservoirs indicate that GHG emissions can significantly vary (up to two orders of magnitude) from one reservoir to another, or in the same reservoir for samples collected at different times of the year, or at the same times of year but in different areas (time/space variability)." Also, without reviewing the study it's not clear whether the measurements of methane and nitrous oxide accounted for the seasonality—that is, like many ecosystems, lakes, wetlands, reservoirs and release GHG emissions during some times of the year and absorb carbon during other times of the year and it's the annual net change that is important to understand.

The commenter suggests that the GHGs associated with the production of cement used to construct the project should be accounted for in the GHG analysis. Please refer to Master Comment Response AQ-4, "Greenhouse Gas Emissions Associated with Cement Production," regarding the level of Greenhouse Gas Emissions Associated with Cement Production.

PFT2-22: The commenter criticizes the GHG analysis for not accounted for the GHGs associated with the manufacturing of the cement that would be used in project construction. Please refer to Master Comment Response AQ-4, "Greenhouse Gas Emissions Associated with Cement Production."

The commenter also suggests that the GHG analysis should account for GHGs from flooded, decomposition of vegetation. Please refer to Master Comment Response AQ-3, "Potential for Greenhouse Gas Emissions Generated by the Decomposition of Soil and Vegetative Material in the Expanded Reservoir."

PFT2-23: The commenter questions the assumption that increased hydroelectric power output would offset GHG emissions from electricity created by fossil fuels.

Please refer to Master Comment Response AQ-1, "Offsetting Greenhouse Gas Emissions with Increased Hydropower," for a discussion that supports this assumption.

The commenter also questions that there would be sufficient water supply to support increased hydropower production due to the many expected effects of climate change, particularly the increasing variability in precipitation levels. The commenter states that Reclamation "is missing an opportunity to secure clean and dependable increases in water supply by failing to include forest and wet meadow restoration in the upper watersheds as part of its proposal for Shasta Dam." The DEIS explain the use of the CalSim-II model, in collaboration with DWR, for estimating future water supply availability beginning on page ES-27 of the Executive Summary of the DEIS.

As explained in Chapter 6, "Hydrology, Hydraulics, and Water Management," on page 6-31 of the DEIS, the SLWRI 2012 Version CalSim-II model was used to simulate CVP and SWP operations, determining the surface water flows, storages, and deliveries associated with each alternative. CalSim-II is a specific application of the Water Resources Integrated Modeling System (WRIMS) to simulate CVP and SWP water operations. CalSim-II typically simulates system operations for an 82-year period and therefore accounts for a wide range of climatic variability. A detailed description of the SLWRI 2012 Version CalSim-II model, including modeling assumptions, is included in Chapter 2 of the Modeling Appendix.

Furthermore, the effects of climate change on operations at Shasta Lake, is discussed in Section 6.3.5, "Cumulative Effects," on page 6-134 of the DEIS. Here the DEIS acknowledges that the effects of climate change could result in changes to hydrology, hydraulics, and water management. As described in the Climate Change Modeling Appendix, climate change could result in higher reservoir releases in the winter and early spring because of an increase in runoff during these times. The change in winter and early spring releases could necessitate managing flood events resulting from potentially larger storms. Similarly, climate change could result in lower reservoir inflows and Sacramento tributary flows during the late spring and summer because of a decreased snow pack. This reduction in inflow and tributary flow could result in Shasta Lake storage being reduced because of both a reduced ability to capture flows and an increased need to make releases to meet downstream requirements.

In addition, further relevant discussion is provided in the cumulative impact analysis that begins on page 6-134. Here it is explained that effects of climate change on operations of Shasta Lake could include increased inflows and releases at certain times of the year, and decreased inflows at other times. The additional storage associated with all the action alternatives potentially would diminish these effects and allow Shasta Lake to capture some of the increased runoff in the winter and early spring for release in late spring and summer.

The commenter does not provide any evidence for why the use of the CalSim-II model is insufficient or why the cumulative analysis, which addresses climate change-related uncertainties, is insufficient.

PFT2-24: The commenter questions the assumption that "but for the raising of the Shasta Dam and the generation of increased hydroelectric power, such power would be sourced from fossil fuels. There is simply no reason to make this assumption." Please refer to Master Comment Response AQ-1, "Offsetting Greenhouse Gas Emissions with Increased Hydropower."

PFT2-25: The commenter falsely assumes that hydropower generated at Shasta Dam would be eligible as renewable power in the context of RES.

Please refer to Master Comment Response AQ-1, "Offsetting Greenhouse Gas Emissions with Increased Hydropower," for an explanation about why it was assumed that fossil fuel-based power would be generated but for the increased hydropower production at Shasta Dam.

PFT2-26: The commenter states that "any new hydroelectric generation that would be provided by the proposal would almost certainly be used by utilities to meet their goal under the [RES], as hydroelectric power qualifies as renewable energy." This is incorrect. Please refer to Master Comment Response AQ-1, "Offsetting Greenhouse Gas Emissions with Increased Hydropower," for an explanation about why it was assumed that fossil fuel-based power would be generated but for the increased hydropower production at Shasta Dam.

The commenter also states that "the water supply for the additional hydroelectric power is unreliable." Please refer to Response PFT2-23.

PFT2-27: Please refer to Master Comment Response WASR-1, "Eligibility of the McCloud River as a Federal Wild and Scenic River," and Master Comment Response WASR-6, "Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542."

PFT2-28: Please refer to Master Comment Response WASR-6, "Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542," and Master Comment Response CEQA-1, "CEQA Compliance."

PFT2-29: Please refer to Master Comment Response COST/BEN-1, "Intent of EIS and Process to Determine Federal Interest," and Master Comment Response COST/BEN-3, "Estimated Increased Water Supply Reliability Under Action Alternatives."

PFT2-30: Please refer to Master Comment Response RAH-1, "Available Water to Fill an Enlarged Reservoir."

PFT2-31: Reclamation understands the value of forest conservation and restoration activities for watershed improvements. These types of programs can benefit overall water supply, but were not included as alternatives in the current Feasibility Planning phase of the SLWRI.

Please refer to Master Comment Response P&N-1, "Purpose and Need and Objectives," Master Comment Response ALTR-1, "Range of Alternatives General," and Master Comment Response ALTS-1, "Alternative Selection."

PFT2-32: Reclamation understands the value of forest conservation and restoration activities for watershed improvements. These types of programs can benefit overall water supply, but were not included as alternatives in the current Feasibility Planning phase of the SLWRI.

Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," and Master Comment Response P&N-1, "Purpose and Need and Objectives."

PFT2-33: Please refer to Master Comment Response AQ-2, "Loss of Carbon Sequestration and Carbon Sequestration Potential," Master Comment Response AQ-3, "Potential for Greenhouse Gas Emissions Generated by the Decomposition of Soil and Vegetative Material in the Expanded Reservoir," and Master Comment Response AQ-4, "Greenhouse Gas Emissions Associated with Cement Production."

PFT2-34: Please refer to Master Comment Response AQ-1, "Offsetting Greenhouse Gas Emissions with Increased Hydropower."

PFT2-35: Please refer to Master Comment Response AQ-1, "Offsetting Greenhouse Gas Emissions with Increased Hydropower."

33.10.31 Pacific Gas & Electric Company

PGE1

Pacific Gas and Electric Company

Law Department
77 Beale Street, B30A
San Francisco, CA 94105
Mailing Address
P.O. Box 7442
San Francisco, CA 94120
Fax: 415.973.5520

July 8, 2013

Ms. Katrina Chow, Project Manager
Bureau of Reclamation, Planning Division
2800 Cottage Way, MP-700
Sacramento, CA 95825-1893

Re: Draft Environmental Impact Statement for Shasta Lake Water Resources Investigation

Dear Ms. Chow:

We are in receipt of the June 25, 2013 letter to Interested Parties for the Public Review and Comment on the Draft Environmental Impact Statement for Shasta Lake Water Resources Investigation, along with a copy of the DVD. The envelope was addressed to Ms. Madelin Mailander, Senior Legal Assistant and Case Manager at P. O. Box 7442, San Francisco, CA 94120 (copy enclosed).

Would you be so kind and delete Ms. Mailander's name from the list of "Interested Parties" and instead add the following name in place of hers:

Annette Faraglia, Esq.
Law Department
PACIFIC GAS AND ELECTRIC COMPANY
P. O. Box 7442
San Francisco, CA 94120-7442

PGE1-1

Thank you.

Very truly yours,

Betsie Diamond

Betsie Diamond, Secretary to
ANNETTE FARAGLIA

BD
Enclosures

cc: Ms. Madelin Mailander, Legal Assistant
Annette Faraglia, Esq.

Responses to Comments from Pacific Gas & Electric Company

PGE1-1: Please refer to Master Comment Response MAILINGLIST-1, "Addition or Change to the Mailing List."