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2 August 2015

Mr. Thomas Howard
Executive Director
Ms. Barbara L. Evoy
Deputy Director, Division of Water Rights
State Water Resources Control Board
1001 "I" Street, 24th Floor
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VIA: Electronic Submission
Hardcopy if Requested

RE: COMPLAINT: Against SWRCB and USBR for Violations of Central Valley Basin Plan, WR Order 90-05, Clean Water Act, Endangered Species Act, Public Trust Doctrine and California Constitution

Dear Mr. Howard and Ms. Evoy:

The California Sportfishing Protection Alliance (CSPA) hereby submits a complaint against the State Water Resources Control Board (SWRCB) and United States Bureau of Reclamation (USBR) for violations of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan), violations of WR Order 90-05 and Sacramento River temperature requirements and for violations of the Clean Water Act (CWA), Endangered Species Act (ESA), Public Trust Doctrine and the California Constitution.

Specifically, CSPA alleges that the SWRCB has failed to implement crucial Basin Plan water temperature criteria and CWA requirements protecting water quality and fish and wildlife beneficial uses with respect to USBR's water rights permits and licenses and has failed to take enforcement actions against USBR's habitual violations of the Basin Plan, CWA and WR Order 90-05 temperature criteria and requirements. CSPA alleges that USBR has failed to comply with explicit temperature criteria protecting fish and wildlife beneficial uses contained in the Basin Plan, CWA and WR Order 90-05. CSPA additionally alleges that the SWRCB and USBR have failed to comply with their respective responsibilities and obligations under the ESA, Public Trust Doctrine and Article X of the California Constitution.

CSPA incorporates by reference the comments, protests, objections (including exhibits) and workshop presentations submitted and presented over the last two years in the SWRCB drought proceedings related to Temporary Urgency Change Petitions (TUCP) and SWRCB TUCP Orders by CSPA et al., Bay Institute, Sequoia Forestkeeper and Restore the Delta. Those documents can be found on the SWRCB's State Water Project and Central Valley Project Temporary

Urgency Change Petition webpage under the headings *Comments/Objections/Protests/Petitions for Reconsideration* and *Temporary Urgency Change Petitions and Drought Workshops.*

We file this complaint in the wake of poor natural production of the 2013 brood year of Sacramento River winter-run, spring-run and fall-run Chinook salmon and the destruction of the 2014 year classes. Given the presence of lethal temperatures in the Sacramento River this year that threaten a repeat of last year's disaster, CSPA asks the SWRCB to act expeditiously in responding and in requiring USBR to respond to the allegations herein. CSPA requests that the SWRCB immediately re-establish protective, non-lethal temperature criteria at the Clear Creek compliance point and that the SWRCB require USBR to reduce water deliveries in order to preserve what's left of cold water reserves in Shasta Reservoir. CSPA further requests the SWRCB to issue sanctions against USBR for failure to comply with the Basin Plan, CWA and ESA.

WR Order 90-05 and the initial listing of winter-run Chinook salmon came on the heels of myriad exceedances of temperature criteria and alarming salmon population declines following the drought of 1976-1977 and the initial years of the 1987-1992 drought. Subsequent droughts brought similar population declines followed by only partial rebounds in wetter years that show a parallel long-term decline in anadromous fisheries. Failure to adopt and enforce defensible temperature criteria has been a key factor in the continued decline of Sacramento Chinook salmon to the point where winter-run and spring-run are now threatened with extinction and California's commercial salmon fishery is wholly dependent on grow-and-truck hatchery production for survival.

As discussed more fully below, the Central Valley Regional Water Quality Control Board (Regional Board) established temperature criteria in the Sacramento River, pursuant to the CWA and the SWRCB implemented the temperature criteria in USBR's permits and licenses in WR Order 90-05. In doing so, the SWRCB implemented temperature criteria based on average daily temperatures without determining whether average daily temperatures were protective of aquatic life and, additionally, exempted almost 43% of identified fish spawning habitat from temperature requirements. The SWRCB then ignored the Basin Plan's Controllable Factors Policy and it's own admonition to USBR that water necessary to meet water quality criteria was not available for delivery. When the National Marine Fisheries Service (NMFS) listed winter-run Chinook salmon as threatened under the ESA, the SWRCB ignored the presence of other species and relocated the temperature compliance point further upstream.

Over the next 23 years, the SWRCB participated in back-room temperature management group meetings that recommended ever-changing temperature compliance points, based upon the quantities of water USBR had remaining in storage after deliveries to its water contractors. The SWRCB subsequently approved the recommendations of the temperature management group of which it is a participating member. These approvals generally relocated temperature compliance points further and further upstream, often eliminating as much as 90% or more of spawning habitat protected by the Basin Plan. And despite these yearly concessions, USBR has violated temperature criteria in nearly every year without a single enforcement sanction being issued by the SWRCB.

The SWRCB has ignored USBR's failure to comply with the National Marine Fisheries Service's (NMFS) OCAP Biological Opinion's (BO) Reasonable and Prudent Action (RPA) performance measures regarding end of September carryover storage at Shasta Reservoir and the percentages-of-time USBR is required to meet temperature criteria at specific compliance points. It has sidestepped the BO's RPA drought exception procedures when end of September Shasta storage is projected to be less that 1.9 million acre-feet (MAF). It refuses to address the conflict that exists under these conditions, between USBR delivering "nondiscretionary" water to Sacramento Settlement Contractors and achieving compliance with temperature objectives, despite the fact that the BO observes that these poor conditions "… could be catastrophic to the species, potentially leading to a significant reduction in the viability of winter-run."

The SWRCB is aware that USBR lacks the legal authority to curtail "nondiscretionary" contract water deliveries to Sacramento Settlement Contractors to meet ESA requirements. Despite being notified of a likely conflict between the delivery of this "nondiscretionary" water and compliance with temperature requirements, the SWRCB refused to use its authorities to reduce water deliveries in order to retain sufficient cold water storage necessary to meet temperature criteria. The BO does not address ESA section 7(a)(2) compliance for individual water supply contracts and, consequently, delivery of water that is "nondiscretionary" for the purposes of the ESA is not exempt from ESA section 9 take prohibitions. In effect, the SWRCB has sanctioned the illegal "take" of endangered species by the USBR and Sacramento Settlement Contractors.

USBR's delivery of 1.3 MAF of water to Sacramento River contractors in 2014 depleted limited cold water reserves in Shasta Reservoir leading to significant exceedances of water temperature criterion. The 2014 year classes of Sacramento winter-run, spring-run and fall-run Chinook salmon were virtually destroyed. Although the SWRCB acknowledged that it had made a serious mistake last year, it has inexplicably elected to repeat the mistake in 2015.

Rejecting the politically unpalatable option of reducing water deliveries to Sacramento Settlement Contractors to ensure compliance with temperature criteria, the SWRCB has instead approved USBR's request to increase the temperature compliance target from a daily average of 56ºF to 58ºF. This despite the fact that the NMFS pointed out in April that an increase to 58ºF would result in adverse impacts to incubating winter-run eggs and alevin in redds and that 58ºF was identified in the scientific literature as lethal to incubating salmon eggs and emerging fry. The subsequent concurrence by NMFS because "the plan provides a ***reasonable possibility*** that there will be ***some juvenile winter-run survival*** this year" is an unacceptable and illegal standard of compliance with the BO and ESA. [Emphasis added.]

The SWRCB justified the higher temperature criterion as necessary to preserve cold water in Shasta to avoid depletion of the cold water pool and more devastating impacts later in the year. However, the urgent need to preserve cold water was apparently unimportant to the SWRCB as USBR delivered 366,794 acre-feet (AF) of water in April and May to Sacramento River water contractors while exporting another 312,686 AF in the first five months of the year. Depletions (i.e., water deliveries) between Bend Bridge and Wilkins Slough in June and July of this year totaled another 500,771 AF.

CSPA et al. and others pleaded with the SWRCB to reduce these water deliveries in order to protect cold water storage. The NMFS summed up the situation in their 1 July 2015 concurrence letter regarding USBR's temperature management request in observing, "We note that these conditions could have been largely prevented through upgrades in monitoring and modeling, and reduced Keswick releases in April and May." Daily average June/July temperatures in the Sacramento River at the Clear Creek compliance point have been significantly higher this year than they were last year.

As we show below, a 56ºF daily average temperature criterion is not protective of Chinook salmon spawning, egg incubation and fry emergence. The U.S. Environmental Protection Agency (USEPA), the states of Washington, Oregon and Idaho, both North Coast and Central Valley Regional Boards, NMFS, California Department of Fish and Wildlife (CDFW), the Pacific Fishery Management Council and the majority of the scientific literature have either adopted or recommended more restrictive temperature criteria based upon a daily maximum and/or a seven-day mean of daily maximums.

In sum, the SWRCB essentially bases its implementation of temperature criteria for Sacramento River Chinook salmon on the amount of water USBR has left over after supplying its contractors. Notwithstanding the law and the fact that protection, restoration and enhancement of fish and wildlife is a coequal purpose of the Central Valley Project (CVP), water deliveries always come first regardless of water year type.

Should winter-run Chinook salmon, Delta and longfin smelt and potentially several other species that have evolved and thrived over millennia go extinct, it will not be because of drought. It will be because the SWRCB has refused to comply with its responsibilities under the Water Code, CWA, ESA, Public Trust Doctrine and California Constitution.

Sacramento River Salmon Fisheries are in a State of Collapse

The precipitous collapse of the Central Valley's pelagic and anadromous fish populations in recent decades has been extensively documented in our referenced documents and need not be repeated at length here. Numerous species dependent on the Sacramento River for all or part of their life cycle have been listed pursuant to state and federal endangered species acts.[1]

Since 1967-68, the U.S. Fish & Wildlife Service's (USFWS) Anadromous Fisheries Restoration Program (AFRP) documents that, since 1967, in-river natural production of Sacramento River

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[1] Southern DPS green sturgeon (*Acipenser medirostris*), federal threatened, candidate for federal endangered; Delta smelt (*Hypomesus transpacificus*), state endangered, federal threatened, Longfin smelt (*Spirinchus thaleichthys*), state threatened; Central Valley steelhead (Oncorhynchus mykiss), federal threatened; Sacramento winter-run Chinook salmon (Oncorhynchus tshawytscha), state endangered, federal endangered; Central Valley spring-run Chinook salmon (Oncorhynchus tshawytscha), state threatened, federal threatened; Central Valley fall/late-fall-run Chinook salmon (*Oncorhynchus tshawytscha*), federal species of concern, state species of special concern; Sacramento splittail (*Pogonichthys macrolepedotus*), state species of special concern; Pacific lamprey (*Entosphenus tridentate*), federal species of concern and river lamprey (*Lampetra ayresi*), state species of special concern. The Project also has potential to adversely affect Killer whales or Orcas (Southern Resident DPS) (*Orcinus orca*), federal listed as endangered because they are dependent upon Chinook salmon for 70% of diet and reduced quantity and quality of diet is one of the major identified causes of their decline.

winter-run, spring-run and fall-run Chinook salmon have decline by 98.2, 99.3 and 91.2 percent, respectively, and are only at 5.5, 1.2 and 31.6 percent, respectively, of doubling levels mandated by the Central Valley Project Improvement Act, California Water Code and California Fish & Game Code.

The construction of Shasta Dam eliminated the ability of Sacramento River winter-run, spring-run and late-fall-run Chinook salmon to reach the cold spring-fed headwaters of the Upper Sacramento, Pit, McCloud and Fall Rivers to spawn.[2] Before the Dam was constructed, there were an estimated 34,634 spawning sites for winter-run salmon available in the Upper Sacramento, McCloud, and Pit River systems. With the exception of Battle Creek, 100% of the winter-run salmon spawned upriver from the present site of Shasta Dam.[3] Pre-Shasta populations of spring-run salmon once had at least 51,377 spawning sites dispersed throughout the Upper Sacramento, the McCloud, and Pit Rivers (PG&E's Pit River dams eliminated an additional 7,444 upriver spawning sites without mitigation). Only about 15% of the fall-run salmon generally spawned above the present site of Shasta Dam. Most fall-run spawned within the lower river and its foothill reaches at elevations less than 500 feet. The construction of Shasta Dam eliminated approximately 201 miles of historically available habitat in the Pit, McCloud and Upper (little) Sacramento Rivers.[4]

Shasta/Keswick dams not only eliminated the vast majority of spawning habitat for winter-run, spring-run and late-fall-run Chinook salmon, they eliminated the quality of drought-proof habitat. The remaining habitat is subject to droughts and USBR's failure to retain sufficient reservoir storage in sequential low water years to meet temperature requirements. Additionally, the remaining spawning habitat is crammed into the 59 miles between Keswick and Red Bluff Diversion Dam (far less in most years) and does not provide necessary spatial separation between overlapping stocks, which leads to superimposition of redds. Under these degraded conditions, it is imperative that every effort be extended to ensure that the quality of remaining spawning habitat is protected. This means complying with temperature objectives for sensitive life stages during critical drought years.

Following the construction of Shasta Dam, significant numbers of winter-run Chinook salmon spawned below Red Bluff. Between 1987 and 1992, 19% of winter-run salmon spawned in the Sacramento River below Red Bluff as far down as Hamilton City. After construction of Red Bluff Diversion Dam in 1964, it was noted that 60% of fall-run Chinook salmon spawned below the Dam.[5] A 1988 DWR report titled *Water Temperature Effects on Chinook Salmon (Oncorhynchus tshawytscha), With Emphasis on the Sacramento River, A Literature Review*

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[2] Yoshiyama RM, Fisher FW, Moyle PB. 1998. Historical abundance and decline of Chinook salmon in the Central Valley region of California. N Am J Fish Manage 18(1998):487–521.

[3] Hallock RJ, Rectenwald H. 1989. Environmental factors contributing to the decline of the winter-run chinook salmon on the upper Sacramento River. In: Northwest Pacific chinook and coho salmon workshop proceedings. Bethesda (MD): American Fisheries Society. p 141–5.

[4] Yoshiyama RM, Gerstung ER, Fisher FW, Moyle PB. 1996. Historical and present distribution of chinook salmon in the Central Valley drainage of California. In: Sierra Nevada ecosystem project: final report to Congress. Volume III: assessments, commissioned reports, and background information. Davis (CA): University of California, Centers for Water and Wildlife Resources. p 309–61.

[5] Hallock, as cited in Lufkin 1991, p 100. Lufkin A, editor. 1991. California's salmon and steelhead: the struggle to restore an imperiled resource. Berkeley (CA): University of California Press.

reported: "By 1976 spawning activity was nearly uniform in the reaches from Balls Ferry to Keswick, Red Bluff to Balls Ferry, and Hamilton City to Red Bluff. More recent data show that the reach from Hamilton City to Red Bluff receives more spawning activity than do both upper reaches combined."[6]

SWRCB Order 90-05 limited temperature protection to Red Bluff, excluding 44 river miles and more than half of the then-extant Chinook spawning habitat from temperature protection. This had the effect of shifting spawning upriver. USBR's failure to provide adequate temperature control on the Sacramento River has pushed spawning ever further upstream. Between 2001 and 2005, only about 1% of winter-run salmon spawned below Red Bluff.[7]

The CDFW annually surveys the Sacramento River to estimate numbers of Chinook salmon that return and spawn. The results are published in annual reports titled *Chinook Salmon Populations for the Upper Sacramento River Basin* and include the results of aerial surveys of spawning redds. CDFW staff recommends using aerial redd data only for comparisons of redd distributions by river sections or for specific needs such as use of a specific area as a spawning location. Aerial redd surveys do not provide complete counts of new redds, but it is assumed that the proportion of redds visible in the various sections during a single flight are identical.

These reports establish that significant Chinook salmon spawning occurs below Red Bluff and, consequently, the Basin Plan's temperature criteria for the reach between Red Bluff and Hamilton City are both justified and necessary. They also illustrate the compression of salmon spawning that has occurred in the extreme upper reaches below Keswick because USBR has failed to provide adequate cold water flows to meet temperature criteria in the river.

- In 2005, 21.1% of fall-run, 15.2% of spring-run, 9.8% of late-fall-run redds were identified below Red Bluff Diversion Dam and 88.9% of winter-run, 30.3% of fall-run, 29.5% of spring-run, and 51.63% of late-fall-run redds were found above the Highway 44 Bridge in Redding.[8]
- In 2007, 17% of fall-run and 10% of late-fall-run redds were below Red Bluff and 83% of winter-run, 25% of fall-run, 43% of spring-run, and 60% of late-fall-run redds were compressed into the 5 miles above Highway Bridge 44 in Redding.[9]
- In 2008, 6% of fall-run and 10% of late-fall-run redds were found below Red Bluff and 92% of winter-run, 35% of spring-run 56% of late-fall-run and 7% of fall-run redds were compressed into the reach above the Highway 44 Bridge.[10]

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[6] Boles G, Turek S, Maxwell C. 1988. *Water Temperature Effects on Chinook Salmon (Oncorhynchus tshawytscha), With Emphasis on the Sacramento River,* California Department of Water Resources. pp. 2, 18.

[7] OCAP BA, 5-12, 2008.

[8] Killam D, Harvey-Arrison C, Chinook Salmon Populations for the Upper Sacramento River Basin 2005, SRSSAP Technical Report No. 6-3, 2006: California Department of Fish and Game, Summary of Aerial Redd Survey Data 2008, Table 2, p. 9.

[9] Killam D, Kreb B, Chinook Salmon Populations for the Upper Sacramento River Basin 2007, SRSSAP Technical Report No. 08-4, 2008: California Department of Fish and Game, Summary of Aerial Redd Survey Data 2008, Table 2, p. 8.

- In 2011, 11% of fall-run redds were below Red Bluff and 78% of winter-run and 88% of late-fall-run and 34% of fall-run redds were above the Highway 44 Bridge. There were no spring-run aerial flights.[11]
- In 2012, 21% of fall-run redds were observed below Red Bluff and 99% of winter-run and 83% of late-fall-run and 22% of fall-run redds were identified into the reach above the Highway 44 Bridge.[12]

Failure to provide adequate temperatures protective of sensitive life stages of Chinook salmon and the resultant compression of spawning habitat are major factors in the continued decline of the species and the threatened extinction winter-run and spring-run salmon.

Violations of the CWA, Basin Plan, WR Order 90-05 and CVPIA

The Regional Board's Basin Plan was adopted pursuant to the CWA and approved by the EPA. With respect to the Sacramento River, the Basin Plan explicitly states, "The temperature shall not be elevated above 56ºF in the reach from Keswick Dam to Hamilton City nor above 68ºF in the reach from Hamilton City to the I Street Bridge during periods when temperature increases will be detrimental to the fishery." Hamilton City is located at River Mile (RM) 199 on the Sacramento River. These temperature requirements protecting Chinook salmon extend up-river for 103 miles to Keswick Dam (RM 302).

As described above, the construction of Shasta and Keswick Dams eliminated virtually the entire historical spawning habitat for winter-run and spring-run Chinook salmon and forced these species to spawn in the river below Keswick. Historically, only 15% of fall-run Chinook salmon spawned in the Sacramento River upstream of Shasta Dan. The majority spawned in the lower river between Keswick and Hamilton City and until recently more than half spawned in the reach between Red Bluff Diversion Dam and Hamilton City.

The Basin Plan also states that temperature objectives are limited to "controllable factors" and "in determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied *provided that beneficial uses will be fully protected*." Emphasis added.

The Basin Plan's Controllable Factors Policy states:

> Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State that are subject to the authority of the State Water Board or Regional Water Board, and that may be reasonably controlled.

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[10] Killam D. Chinook Salmon Populations for the Upper Sacramento River Basin in 2008, SRSSAP Technical Report No. 09-1, 2009: California Department of Fish and Game, Summary of Aerial Redd Survey Data 2008, Table 3 p. 9.

[11] Killam D. Chinook Salmon Populations for the Upper Sacramento River Basin in 2011, RBFO Technical Report No. 03-2012: California Department of Fish and Game, Summary of Aerial Redd Survey Data 2011, Table 2 p. 15.

[12] Killam D. Chinook Salmon Populations for the Upper Sacramento River Basin in 2012, RBFO Technical Report No. 02-2013: California Department of Fish and Game, Summary of Aerial Redd Survey Data 2012, Table 2, p. 14.

In 1990, the SWRCB issued WR Order 90-05, which implemented the Basin Plan with respect to USBR's water rights and licenses for the CVP. It requires USBR to meet a daily average water temperature of 56ºF in the Sacramento River at Red Bluff Diversion Dam (RM 243) during periods when higher temperatures will be detrimental to the fishery. WR Order 90-05 states that when factors beyond the control of USBR prevent attainment of 56ºF temperatures at Red Bluff Diversion Dam, USBR may, after consultations with the fishery agencies and subject to approval of the SWRCB, designate an upstream location where it can meet the 56ºF requirement.

The SWRCB addressed controllable factors in maintaining cold-water pools for temperature control in WR Order 92-02 (Order Establishing Drought-Related Requirements for the Bay-Delta Estuary During 1992) when it referenced WR Order 90-05, at page 9:

> The State Water Board also has advised the USBR that decisions on water deliveries are subject to the availability of water, and that water should not be considered available for delivery if it is needed as carryover to maintain an adequate cold water pool for the fishery.

WR Order 90-05 ignored and failed to protect the 44 miles of river between Hamilton City and Red Bluff that comprises almost 43% of the spawning habitat protected by the Basin Plan. The Order also violated the Basin Plan when it established an average temperature of 56ºF, without regard to whether daily average temperatures that allow daily exceedances above 56ºF will *fully protect beneficial uses* during critical periods. As we demonstrate below, daily average temperature criteria are not protective of the fishery, as daily maximums can be lethal to fish.

The SWRCB also ignores and violates the Basin Plan's Controllable Factors Policy and its own advice to USBR as it approves the yearly Sacramento River Temperature Management Plans (TMPs) submitted by USBR to the SWRCB that shifts the compliance point upstream thereby further restricting the amount of spawning habitat available to salmon. As discussed more fully below, in recent years the SWRCB has approved TMPs that establish the compliance point at Clear Creek. This compresses spawning to a 10 mile reach below Keswick: a 90% reduction of Basin Plan and 83% reduction in BO protected spawning habitat. In 2015, SWRCB even violated its average daily 56ºF criterion, when the Executive Officer unilaterally approved an USBR request to raise the temperature standard to a target of 57ºF not to exceed 58ºF.

USBR has consistently operated to a pattern and practice of maximizing water deliveries without regard to reserving sufficient water storage to comply with water quality standards. It schedules water deliveries in the spring based on assumptions of future rainfall and not what was stored from the preceding wet season. The adverse consequences of this reckless policy are magnified during drought sequences. Delivering excessive quantities of water and draining reservoirs to the point of not being able to comply with water quality standards is not a defensible excuse for the failure to provide adequate cold water to protect fisheries. The pattern and practice of delivering near normal water supplies in the early years of drought, depleting carryover storage and then relying on the SWRCB to weaken water quality standards has been extensively discussed and documented in previous protests, objections and SWRCB TUCP workshops and is referenced and need not be repeated here.

The SWRCB has acquiesced and participated in this pattern and practice. It has disregarded Basin Plan and CWA requirements, relied upon average temperature criteria, approved temperature criteria that permit lethality, excluded significant reaches of identified spawning habitat from requirements to comply with temperature criteria, approved relocated compliance locations based upon USBR's willingness to reserve storage to meet water quality standards, and failed to enforce violations of temperature criteria.

Enactment of the Central Valley Project Improvement Act (CVPIA) in 1992 seems to have been forgotten. Co-equal with water supply, the protection, restoration and enhancement of fish and wildlife are now primary purposes of the CVP. Mitigation for previous dam construction, contributions to efforts to protect the Bay-Delta and the doubling of natural production of anadromous fisheries in Central Valley rivers are now CVP purposes.

Yet, USBR, with SWRCB approval, ignores the CVPIA requirement to achieve a reasonable balance between competing demands, and continues to operate the CVP primarily to deliver water to its customers and only secondarily to protect and enhance fisheries and public trust values. Deliveries to Settlement Contractors cannot take precedence over fish and wildlife requirements because the water rights of both USBR and the Settlement Contractors are subject to compliance with water quality criteria, the reasonable use doctrine and public trust balancing.

Both the SWRCB and USBR appear to regard NMFS' BO for the Long-Term Operational Criteria and Plan for Coordination of the CVP and SWP (OCAP) as having primacy over the CWA, Basin Plan, WR Order 90-05 and Public Trust Doctrine. Additionally, NMFS appears to believe that its BO protecting Chinook salmon spawning on the Sacramento River is subservient to USBR's desires to maximize water deliveries to its Settlement Contractors.

The NMFS OCAP BO's Reasonable and Prudent Action (RPA) 1.2.1 (page 592) establishes performance measures for temperature compliance points and End-of-September (EOS) carryover storage that must be attained.

Performance measures for EOS storage at Shasta Reservoir include:

- 87 percent of years: Minimum EOS storage of 2.2 MAF
- 82 percent of years: Minimum EOS storage of 2.2 MAF and end-of-April storage of 3.8 MAF in following year (to maintain potential to meet Ball's Ferry compliance point)
- 40 percent of years: Minimum EOS storage 3.2 MAF (to maintain potential to meet Jerry's Ferry compliance point in the following year)

Review of Shasta Reservoir storage records reveals that, over the last 10 years, USBR has failed to meet the performance requirements. They met the 2.2 MAF EOS storage requirement only 50% of the time, met the 2.2 MAF EOS and 3.8 MAF end-of-April requirement only 60% of the time and met the EOS storage of 3.2 MAF requirement only 30% of the time.

Reasonable and Prudent Action performance measures for temperature compliance points during the summer season, measured as a 10-year running average, include:

- Meet Clear Creek Compliance point 95% of the time
- Meet Balls Ferry Compliance point 85% of the time
- Meet Jelly's Ferry Compliance point 40% of the time
- Meet Bend Bridge Compliance point 15% of the time

Review of daily average temperature data for the Clear Creek compliance point (RM 292), Balls Ferry (RM 276), Jelly's Ferry (RM 266) and Bend Bridge (RM 258) compliance points reveals that, between 2007 and 2015, there were temperature exceedances at Bend Bridge and Jelly's Ferry in all years, exceedances at Ball's Ferry 66.6% of the years and exceedances at Clear Creek 55.5% of the years.

The NMFS OCAP BO's RPA 1.2.3.C (page 600) establishes drought exception procedures if the February forecast, based on 90% hydrology, shows that the Clear Creek temperature compliance point or 1.9 MAF Shasta Reservoir EOS storage is not achievable. Under these conditions, there is clear potential that minimal requirements for winter-run egg survival and spring-run spawning requirements will not be achieved due to depletion of the cold water pool, resulting in temperature-related mortality to both winter-run spring-run salmon. The BO's effects analysis concludes that these conditions could be catastrophic to the species.

Consequently, RPA 1.2.3.C requires preparation of a contingency plan, relaxation of Wilkins Slough criteria to at most 4,000 cfs and:

> *Notification to State Water Resources Control Board that meeting the biological needs of winter-run* and the needs of resident species in the Delta, *delivery of water to nondiscretionary Sacramento Contractors* and Delta outflow requirements per D-1641, *may be in conflict* in the coming season and *requesting the Board's assistance* in determining appropriate contingency measures, and *exercising their authorities* to put these measures in place. [Emphasis added.]

The BO makes clear that an appeal to the SWRCB was necessary because Sacramento Settlement Contractor withdrawal volumes of water from the river can be substantial and because the court had concluded that USBR did not have discretion to curtail deliveries to Sacramento Settlement Contractors to meet federal ESA requirements. Unfortunately, while the SWRCB has the authority to reduce water deliveries to Settlement Contractors, it has demonstrated in this and previous droughts that it lacks the political will to do so.

Review of Shasta storage levels and deliveries to Sacramento Valley Contractors reveals that in the second drought year of 2013, USBR delivered 1.6 MAF to Sacramento Settlement Contractors and 249 TAF to Tehama-Colusa Canal, thereby drawing down EOS storage to only 1.9 MAF. In the third drought year of 2014, with a February projection of Shasta EOS storage to be less than 1.9 MAF, USBR delivered 1.99 MAF of water to Sacramento Settlement Contractors and Tehama-Colusa Canal drawing down Shasta EOS storage to only 1.16 MAF. Failure to meet temperature criteria in 2014 devastated the winter-run, spring-run and fall-run year classes.

In the fourth drought year of 2015, USBR scheduled 75% of contracted water deliveries on 27 February despite a February projection of Shasta EOS storage of only 903 TAF. In April and May, USBR delivered 337,339 AF of water to the Settlement Contractors and 36,898 AF to the Tehama-Colusa Canal, forcing USBR to request that the SWRCB increase the 56ºF temperature criterion at Clear Creek compliance point to 58ºF. In April 2015, the NMFS said that the fishery agencies believed an increase in the temperature criterion to 58ºF would result in significant impacts and a likelihood of adverse impacts to incubating winter-run eggs and alevin in redds compared to a daily average of 56ºF. But, by 1 July 2015, NMFS had been ***persuaded*** that an increase to 58ºF was consistent with the BO because there was a ***reasonable possibility*** that there would be ***some juvenile winter-run survival*** this year.

USBR's continuing lack of compliance with temperature requirements is illustrated in a review of Sacramento River temperature control history in the NMFS' OCAP BO. Figure 6-18, on page 263, titled *Historical exceedances and temperature control point locations in the upper Sacramento River from 1992 through 2008* shows Shasta storage, the starting compliance point and changes in temperature compliance points and the reasons for the changes. It reveals that compliance points were frequently moved, often multiple times in a single year, in response to exceedances of water quality criteria. Compared with recent actions discussed below, not much has changed: the compliance point is a floating target that is frequently relocated because it is dependent upon how much water USBR is prepared to provide to comply with water quality criteria and protect fisheries.

The rationale and justification for meeting temperature criteria is described in the OCAP BO at Page 91, Section 4.2.1.2.3.3.4 titled *Water Temperatures for Successful Spawning, Egg Incubation, and Fry Development.* It states:

> Reclamation releases cold water from Shasta Reservoir to provide for adult winter-run migration, spawning, and egg incubation. *However, the extent winter-run habitat needs are met depends on Reclamation's other operational commitments, including those to settlement contractors, water service contractors, D-1641 requirements, and projected end of September storage volume. Based on these commitments, and Reclamation's modeled February and subsequent monthly forecasts, Reclamation determines how far downstream 56ºF can be maintained and sustained throughout the winter-run spawning, egg incubation, and fry development stages. Although WRO 90-05 and 91-1 require Reclamation to operate Keswick and Shasta dams, and the Spring Creek Powerplant, to meet a daily average water temperature of 56ºF at RBDD, they also provide the exception that the water temperature compliance point (TCP) may be modified when the objective cannot be met at RBDD. In every year since the SWRCB issued WRO 90-05 and 91-1, operations plans have included modifying the RBDD compliance point to make best use of the coldwater resources based on the location of spawning Chinook salmon* (CVP/SWP operations BA page 2-40). Once a TCP has been identified and established, it generally does not change, and therefore, water temperatures are typically adequate for successful, egg incubation, and fry development for those redds constructed upstream of the TCP. *However, the annual change in TCP has degraded the conservation value of spawning habitat (based on water temperature).* [Emphasis added.]

Regardless of the OCAP BO's description of how USBR views its obligations to deliver water or the process of by which temperature compliance points are selected, it is USBR's ultimate responsibility to comply with the legal water quality criteria in the Basin Plan that was developed pursuant to the federal CWA and approved by USEPA as a condition of operations. USBR is not entitled to operate its project in violation of legal requirements simply because it is the USBR.

The approval of fishery agencies cannot be legally employed as an excuse for USBR's not complying with water quality standards. Nor is the SWRCB's failure to incorporate the full water quality protections in the Basin Plan a defensible excuse. Delivering contracted water and drawing down reservoir levels and depleting cold water storage to the point of not being able to meet temperature requirements is a controllable factor. USBR's contracts for delivering water are predicated on compliance with water quality standards, and USBR's desire to maximize water deliveries and the SWRCB's lack of political will to reduce deliveries to Sacramento Settlement Contractors cannot be used to justify failure to comply with the law.

Yet, over the years, USBR, the fishery agencies and SWRCB have gathered together in secret rooms to determine temperature compliance points. The Sacramento River Temperature Task Group (SRTTG) advises USBR on the best course of action to take regarding temperature compliance, based on fish surveys, real-time data and temperature modeling all functioning within the limits of the quantity of water USBR is willing to provide. The SRTTG is comprised of the USFWS, NMFS, CDFW, SWRCB, Western Area Power Administration and the Hoopa Tribe. A TMP is prepared yearly and submitted to the SWRCB for approval.

In an interesting conflict of interest conundrum, the SWRCB participates in the SRTTG that devises and recommends a TMP and then the SWRCB, as a regulatory agency, evaluates and approves the recommendation that is always less protective than CWA/Basin Plan requirements.

In 2009, the SRTTG set the temperature compliance point at Airport Road (RM 284) in Anderson, thus eliminating 85 miles of spawning habitat protected by the Basin Plan, 41 miles protected by the WR Order 90-05 or 26 miles under the BO. In 2010, Shasta Reservoir received above normal inflow and filled. The SRTTG set the temperature compliance point at Jelly's Ferry (RM 267), eliminating 68 miles of spawning habitat protected by the Basin Plan, 24 miles protected by WR Order 90-05 and 9 miles under the BP.

The SRTTG Annual Report for 2011 revealed that temperature compliance was targeted at Balls Ferry (RM 276) until 1 June and Jelly's Ferry (RM 266) until 31 October. Shasta Reservoir had 3.99 MAF of water, as of 1 April 2011, and inflow was expected to be above average. Yet USBR claimed that 56ºF temperatures could not be met at Red Bluff during a wet year and, with the approval of the fishery agencies, eliminated 61% of spawning habitat from any temperature requirement until 1 June and subsequently eliminated 46% of spawning habitat in the critical spawning period for winter-run Chinook salmon.

The 2011 Independent Panel report, as quoted in the 2012 SRTTG Annual Report observed:

> The TCP at Bend Bridge, which is required to be met only 15% of the time (i.e., 1.5 yrs out of 10), has not been met in either this or the previous year. *If the TCP at this location*

> *was not met in WY2011 –one of the least challenging years in terms of available reservoir storage – it seems unlikely that it can be met in any year.* [Emphasis added.]

In 2012, the temperature compliance point began at Jelly's Ferry (RM 266) was moved up to Balls Ferry (RM 276) and ended the year at Jelly's Ferry. The 2012 SRTTG Annual Report also highlighted another problem: when high releases to meet delivery and temperature requirements are dramatically reduced following the close of the irrigation and temperature control seasons, there is considerable dewatering of fall-run and late-fall-run Chinook salmon redds.

In 2013, the SRTTG recommended and USBR operated to meet an initial temperature compliance point at Balls Ferry (RM 276), but in June it was moved upstream to Anderson (RM 284). The 2013 SRTTG Annual Report demonstrated how relocating temperature compliance points upstream compressed spawning. In 2012, 63.6% of fall-run and 95.9% of late-fall-run Chinook salmon spawned in the 26 miles between Keswick and Balls Ferry and, in 2013, 98.4% of winter-run Chinook salmon spawned in the 3 miles between Keswick and the ACID Dam, with another 22.5% above the Highway 44 bridge. It also reported that 35% of monitored fall-run redds were dewatered when flows were abruptly reduced from 7,000 to 4,000 cfs in WY2013 and that 8,011 fall-run and 650 winter-run salmon were observed stranded by CDFW crews between 7 February 7 and 4 April 2013.

In 2014, the SRTTG established a temperature compliance point at Clear Creek (RM 292), with the approval of the SWRCB Executive Director. This provided 10 miles of spawning habitat but eliminated 34 miles of spawning habitat under the BO, 49 miles of spawning habitat under WR Order 90-05 and 93 miles of spawning habitat protected under the Basin Plan. However, flawed modeling and reckless mismanagement prevented USBR from even protecting this upper 10 miles of spawning habitat. The cold water pool in Shasta Reservoir was depleted because USBR delivered 1.2 MAF of water to Sacramento Settlement Contractors and 119 TAF to the Tehama-Colusa Canal and exported 1.5 MAF via the Jones Pumping Plant in the Delta during 2014, the third year of the drought. Shasta Reservoir was drawn down to 1.05 MAF by January 2015.

With cold water depleted, the temperature objective was exceeded and 100% of the winter-run Chinook salmon redds were exposed to temperatures above 56ºF. It is estimated that 95% of winter-run, 98% of fall-run and virtually all of the spring-run Chinook salmon brood year was lost because of the USBR's failure to comply with temperature objectives.

On 6 April 2015, the SWRCB Executive Director directed USBR to prepare and implement a 2015 TMP for the Sacramento River for the protection of winter-run, Chinook salmon and other salmonids. USBR submitted a draft TMP in mid-April and an updated plan on 4 May 2015. The Executive Director provisionally approved the TMP on 14 May. USBR subsequently informed the SWRCB that it could not meet the 56ºF temperature requirement at Clear Creek, and the Executive Director suspended his approval of the TMP on 29 May. The SWRCB held a workshop on 24 June, where CSPA, NRDC and the Bay Institute provided highly critical comments on the proposed TMP. USBR submitted a revised TMP on 25 June, the NMFS provide a concurrence letter on 1 July and the Executive Director approved the TMP on 7 July 2015.

The approved TMP set a daily average temperature target of 57ºF at Clear Creek, not to exceed 58ºF. To preserve cold-water storage, the Order limited Keswick releases to 7,250 cfs in June, July and August, 6,500 cfs in September and 5,000 cfs in October, subject to change in accordance with real-time monitoring and decision-making.

So far in 2015, daily average temperatures at the Clear Creek compliance point averaged 57.3ºF in June and 57.1ºF in July. Daily maximum temperatures at Clear Creek averaged 59.6ºF in June and 59.2ºF in July. USBR violated the not-to-exceed 58ºF weakened daily average criterion on June 16 (58.038), 17 (58.42), 18 (58.19) and 24 (58.18). Based upon the scientific literature, significant instantaneous mortality to the 2015 winter-run Chinook salmon brood class has already occurred, and substantial delayed mortality can be expected to occur.

The fishery agencies initially opposed USBR's proposal to increase temperature limits from 56ºF to 58ºF because they believed it was not protective of early Chinook salmon life stages. NMFS' 15 April 2015 *Evaluation of Alternatives for Sacramento River Water Temperature Compliance for Winter-fun Chinook Salmon* is posted on the SWRCB's website. The Evaluation points out, on page one:

> A requirement in NOAA's National Marine Fisheries Service's reasonable and prudent alternative is to provide water temperatures *no greater than a daily average of 56ºF in the upper Sacramento River to provide habitat needs for various life history stages of Sacramento River winter-run Chinook salmon.* [Emphasis added.]
>
> The fish agencies (NMFS, USFWS, and CDFW) have reviewed various alternatives to temperature compliance, including a targeted daily average water temperature Shasta Dam (e.g., 52ºF or 53ºF) and *increasing the temperature target from 56ºF to 58ºF* at the Sacramento River above Clear Creek CDEC monitoring station (CCR) compliance point after the eggs hatch. As a result of their assessment, the fish agencies *do not think that these alternatives would result in negligible impacts and/or little likelihood of adverse impacts to incubating winter-run eggs and alevin in redds compared to a daily average of 56ºF.* [Emphasis added.]
>
> For example, a heat wave in Redding (>105ºF) with these operation could lead to elevated *temperatures above 56ºF at CCR, leading to potentially significant winter-run egg mortality and sublethal effects.* [Emphasis added.]

Having acknowledged that NMFS, USFWS and CDFW believe that an increase of daily average temperatures from 56ºF to 58ºF would result in adverse impacts, the Evaluation observes, on page 5, that <u>violations occur nearly every year because of USBR commitments to water contractors</u>:

> Even though State Water Resources Control Board Orders 90-5 and 91-1 require Reclamation to operate Keswick and Shasta dams to meet a daily average temperature of 56ºF at Red Bluff Diversion Dam (RBDD) [or at a temperature compliance point (TCP) modified *when the objective cannot be met at RBDD based on Reclamation's other operational commitments including those to water contractors*, D-1641 regulations and

> criteria, and projected end of September storage volume], *nearly every year, Reclamation has exceeded the TCP at some point throughout the temperature control season.* Especially last year, 100% of winter-run brood year 2014 redds were exposed to temperatures above 56ºF degrees at the CCR TCP at some time period during the water year (see Figure 3). Emphasis added.

But USBR, with SWRCB acquiescence, did an end run around the fishery agencies and eliminated all possibility of using Shasta storage to meet a 56ºF temperature criterion, even at Clear Creek. In April and May of this year, USBR, despite pleas from CSPA, Bay Institute, NRDC and others to reduce deliveries in order to protect the cold water pool in Shasta Reservoir, delivered 366,794 AF to the Sacramento Settlement Contractors and Tehama-Colusa Canal and exported an additional 312,686 AF of water from the Delta. These deliveries eliminated any possibility that the water would be used to meet water quality standards and fishery needs.

Faced with a *fait accompli* and unwilling to hold their partner accountable for violations of the CWA and ESA, the fishery agencies went along and issued consistency determinations that claimed the TMP was consistent with the BOs. The situation is described in the conclusion of NMFS's 1 July 2015 consistency determination for the TMP:

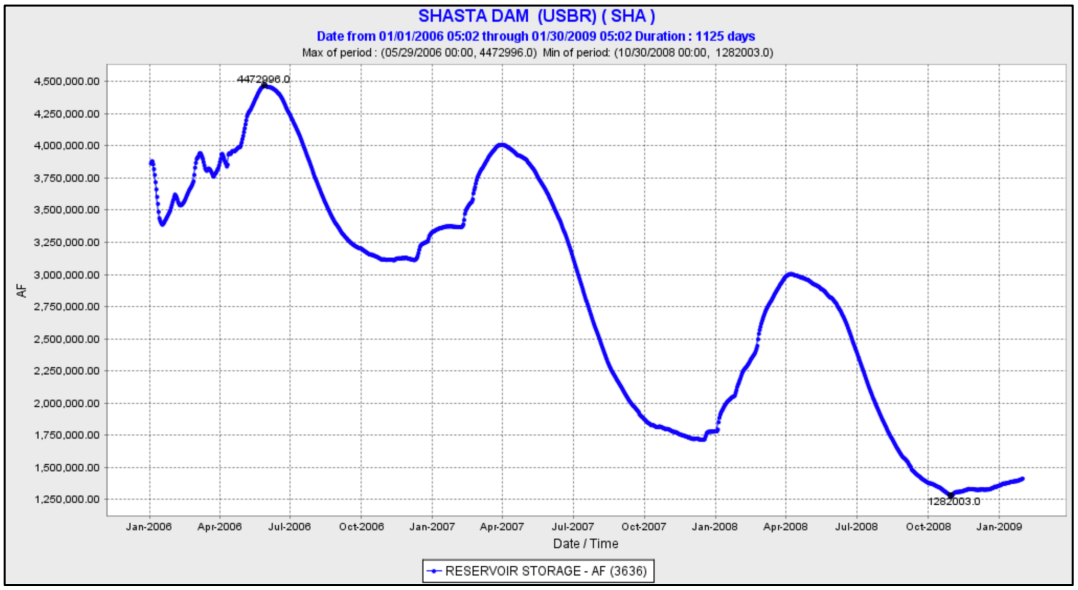
> NMFS acknowledges that storage in Shasta Reservoir at the beginning of the temperature management season in June, and the quantity and quality of the cold water pool, *will not provide for suitable winter-run habitat needs throughout their eggs and alevin incubation and fry rearing periods*. The base operations plan, including the Keswick release schedule, delayed use of full side gates, and real-time monitoring and decision-making based on winter-run timing, location of redds, air and surface water temperature modeling, and projected versus actual cold water storage conditions and downstream water temperatures, represents the best that can be done with a really bad set of conditions. *We note that these conditions could have been largely prevented through upgrades in monitoring and modeling, and reduced Keswick releases in April and May. Based on extensive analyses of alternative scenarios (6,000 to 8,000 cfs Keswick releases), the plan provides a reasonable possibility that there will be some juvenile winter-run survival this year.* [Emphasis added.]

And that's the best that can be hoped for this year, "a reasonable possibility that there will be some juvenile winter-run survival this year." Had USBR and the SWRCB heeded the pleas to not deliver 2.8 MAF of water and draw down Shasta by 1.05 MAF of water last year in the third year of drought, had they heeded the pleas to not deliver 374,237 AF of water to Sacramento Settlement Contractors and the Tehama-Colusa Canal in April and May of this year, had they heeded pleas to not continue to further deplete cold water storage by delivering more than 500,000 AF in June and July to water agencies along the Sacramento River, there might be more than mere hope that some winter-run might survive this year.

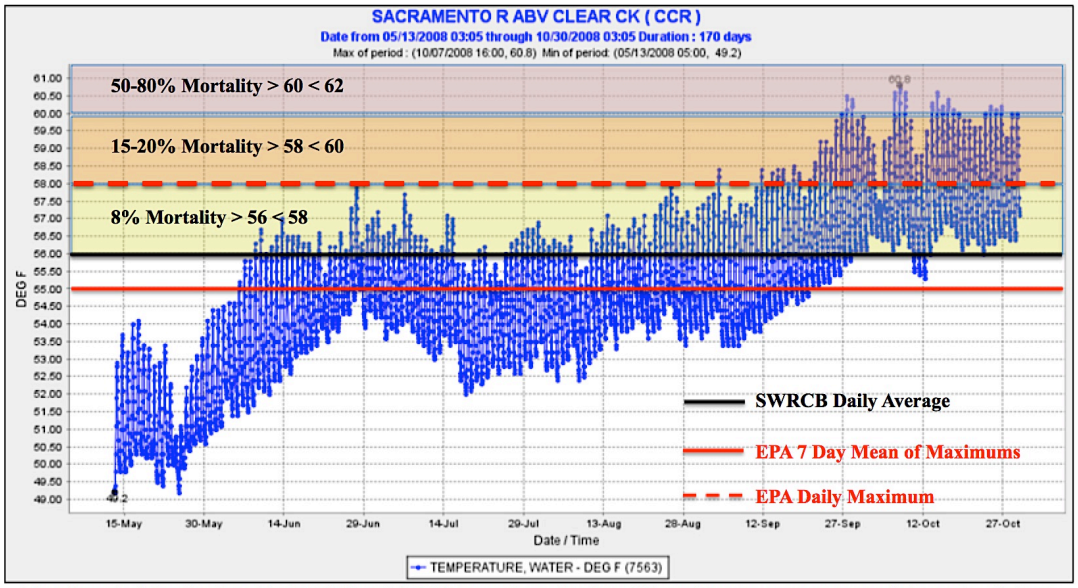
But reserving water needed to meet water quality standards and public trust fishery needs has never been a part of USBRs operating protocols. The pattern and practice of draining reservoirs in the initial years of a drought sequence and then either violating water quality and fishery standards or turning to the SWRCB to bail them out of having to comply with water quality

standards is deeply ingrained in USBR's operations. The last two drought sequences illustrate the pattern.

During the drought of 2007-2009, USBR delivered 100% of the contracted water to water contractors along the Sacramento River. Deliveries to Sacramento Settlement Contractors and Tehama-Colusa Canal in 2006, 2007, 2008 and 2009 totaled 1.7, 1.9, 1.9 and 1.8 MAF, respectively. CVP Delta Exports in 2006, 2007, 2008 and 2009 were 2.6, 2.6, 1.8 and 1.9 MAF, respectively. Shasta Reservoir was drawn down from 4.47 MAF in April 2006 to 1.28 MAF in November 2008, leaving insufficient cold water remained to comply with temperature criteria.



Sacramento River Above Clear Creek Temperatures: 15 May – 30 November 2008



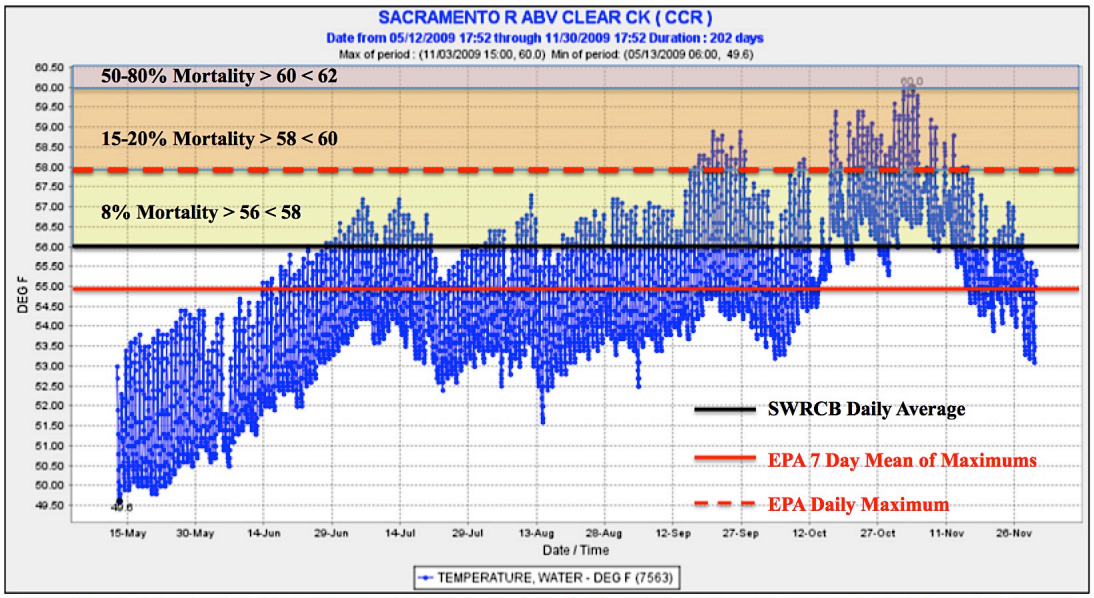
Mortality schedules developed by USFWS and CDFG for use in evaluation of Shasta Dam temperature control alternatives in June 1990 (Richardson et al. 1990).

Winter-run Chinook salmon spawning generally begins in late April and extends into early

August, eggs hatch between late June and middle-to-late September, and fry emerge between late July and late October. Spawning through incubation to emergence are critical life stages.

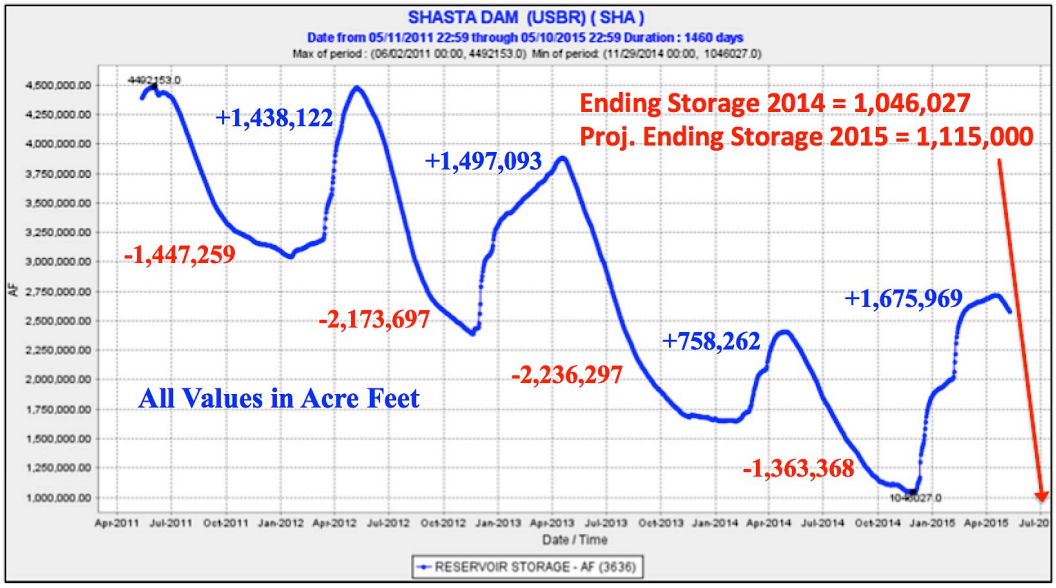
Temperatures at Clear Creek in 2008 ranged into lethal zones during spawning and egg incubation and exceeded even the SWRCB's inadequate daily averages during fry emergence. Temperatures in the 90% of identified spawning habitat below Clear Creek were much higher.

Sacramento River Above Clear Creek Temperatures: 15 May – 30 November 2009



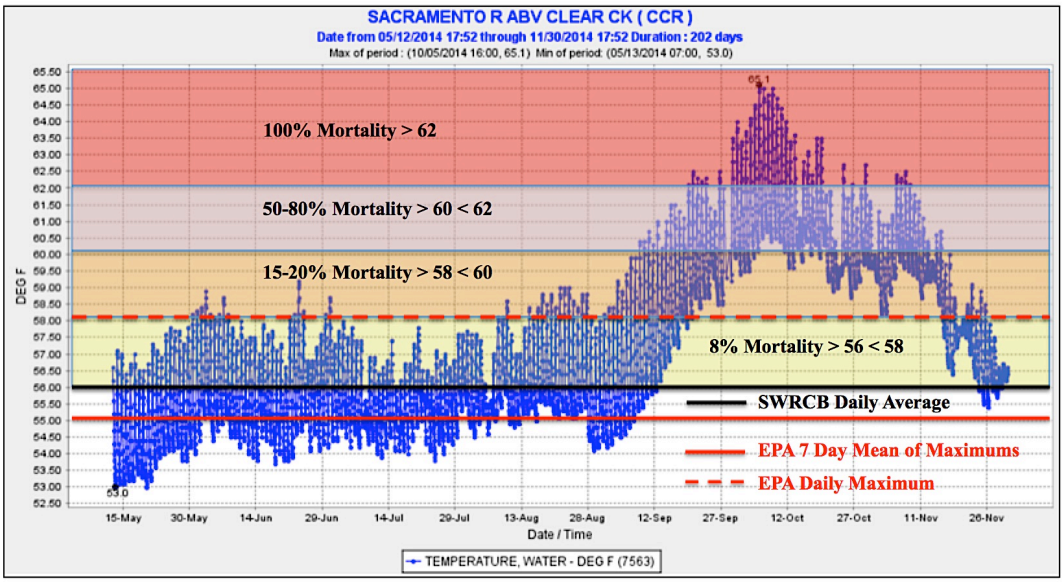
Mortality schedules developed by USFWS and CDFG for use in evaluation of Shasta Dam temperature control alternatives in June 1990 (Richardson et al. 1990).

The pattern repeated itself in 2009 as shown above.



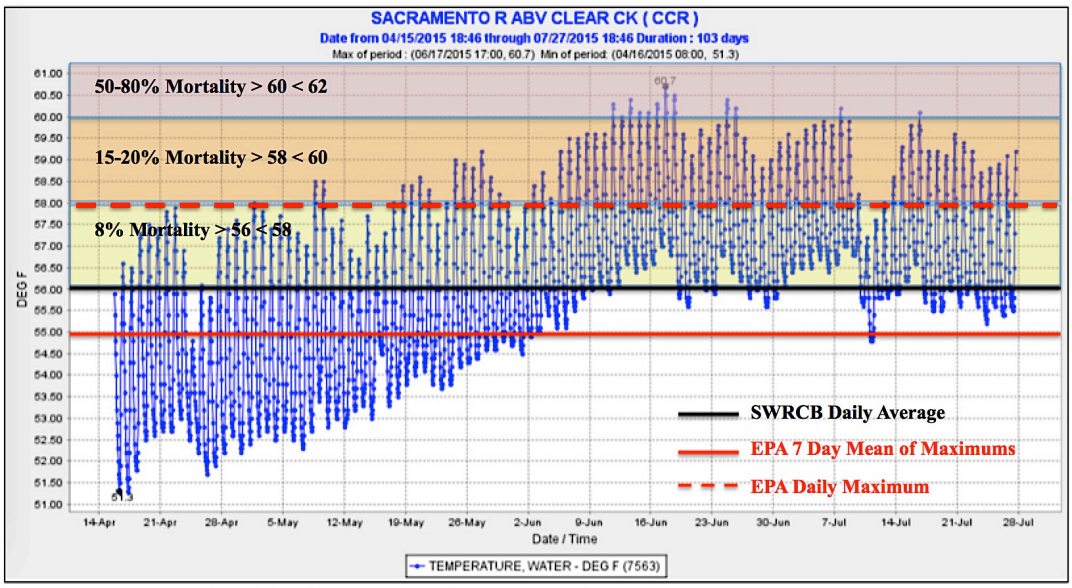
During the present drought, USBR scheduled deliveries of 100% of contracted water to Sacramento Contractors in 2012 and 2013 and 75% in 2014 and 2015. Deliveries to contractors along the Sacramento River in 2012, 2013 and 2014 totaled 1.8, 1.99 and 1.3 MAF, respectively. In 2012, 2013, 2014 and 2015 CVP Delta Exports were 2.1 MAF, 1.5 MAF, 874 TAF, and 334 TAF so far this year. Consequently, end-of-year storage in Shasta Reservoir plummeted.

Sacramento River Above Clear Creek Temperatures: 15 May – 31 October 2014



Mortality schedules developed by USFWS and CDFG for use in evaluation of Shasta Dam temperature control alternatives in June 1990 (Richardson et al. 1990).

Sacramento River Above Clear Creek Temperatures: 15 April – 27 July2015



Mortality schedules developed by USFWS and CDFG for use in evaluation of Shasta Dam temperature control alternatives in June 1990 (Richardson et al. 1990)

Excessive water deliveries in the initial drought years depleted cold water pools in Shasta. Water temperature intruded well into lethal zones during spawning and egg incubation and soared

during late incubation are fry emergence. The entire brood years of winter-run, spring-run and fall-run Chinook salmon were devastated.

CSPA has been unable to find a single example of the SWRCB taking an enforcement action against USBR for violations that occur "nearly every year," including the 2014 violations that destroyed an estimated 95% of winter-run, 98% of fall-run and virtually all of the spring-run brood class. Perhaps the SWRCB's participation in the closed-door meetings that recommends TMPs that fail to comply with CWA/Basin Plan requirements precludes it from taking an enforcement action against a fellow SRTTG member for violations of the TMP. This exhibits all of the characteristics of classic "conflict of interest" and "regulatory capture."

Average Temperature Requirements are Not Protective of Chinook Salmon

Following a long extensively peer-reviewed court ordered proceeding, USEPA Region 10 issued *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards* (Region 10 Guidance) in 2003. The Guidance establishes a recommended criterion of 13ºC (55ºF), as a 7 day average of the daily maximums (7DADM), for Chinook salmon, steelhead and trout spawning, egg incubation and fry emergence, 16ºC (61ºF) for salmon and steelhead "core" juvenile rearing and 18ºC (64ºF) for salmon and steelhead migration plus non-core juvenile rearing. The states of Washington, Idaho and Oregon have established temperature criteria for Chinook salmon spawning through fry emergence as 7DADM 13ºC (55.4ºF, 16ºC (60.8ºF) for salmonid core summer habitat and 17.5ºC (63.5ºF) for salmonid rearing and migration.

The 7DADM protects against not only the lethal effects of elevated temperatures but also the chronic and sublethal impacts that frequently occur in waters that meet weekly average temperatures. High daily maximum temperatures can lead to excessive mortality in waters that still meet weekly averages. Chronic and sublethal effects include reduce juvenile growth, increased incidence of disease, reduced viability of gametes in adults prior t spawning, increased susceptibility to predation and competitions and suppressed or reversed smoltification.

In 2011, USEPA Region 9, in disapproving the SWRCB's 2008-2010 306(d) list of impaired waterbodies, added the San Joaquin, Merced, Tuolumne and Stanislaus Rivers to the 303(d) list as impaired by temperature based partly on the Region 10 guidance and partly on recommendations by the California Department of Fish and Wildlife (CDFG) and the Regional Board, both of which used the Region 10 Guidance and other studies. The USEPA Region 9 letter stated,

> Additionally, EPA believes that EPA's Temperature Guidance values are appropriate for use in the Central Valley. The criteria have been used by California in their 303(d) list recommendation as well as selected as targets in Total Maximum Daily Loads (TMSLs) in the North Coast Regional of California (Carter 2008). They have also been used by National Marine Fisheries Service (NMFS") to analyze the effects of the long term operations of the Central Valley Project and State Water Project, and to develop the reasonable and prudent alternative actions to address temperature-related issues in the Stanislaus River (NMFS 2009a). Reviews of appropriate temperature criteria for use in

> the Stanislaus have yielded findings consistent with the EPA Temperature Guidance values (Deas (2004) and Marston (2003)).

The USEPA Region 9 letter also quoted a 2010 letter from Maria Rea, NMFS, to Alexis Straus (USEPA) that also supports the use of the Region 10 Guidance:

> The use of the US EPA 2003 criteria for listing water temperature impaired water bodies in the San Joaquin River basin is scientifically justified. It has been recognized that salmonid stocks do not tend to vary much in their life history thermal needs, regardless of their geographic location. There is not enough significant genetic variation among stocks or among species of salmonids to warrant geographically specific water temperature standards (US EPA 2001). Based upon reviewing a large volume of thermal tolerance literature, McCullough (1999) concluded that there appears to be little justification for assuming large genetic adaptation on a regional basis to temperature regimes.
>
> Although many of the published studies on the responses of Chinook salmon and steelhead to water temperature have been conducted on fish from stocks in Oregon, Washington, and British Columbia, a number of studies were reported for the Central Valley salmonids. Myrick and Cech (2001, 2004) performed a literature review on the temperature effects on Chinook salmon and steelhead, with a focus on Central Valley populations…
>
> It is evident that the difference in thermal response is minimal in terms of egg incubation, growth, and upper thermal limit. Healey (1979, as cited in Myrick and Cech 2004) concluded that Sacramento River fall-run Chinook salmon eggs did not appear to be any more tolerant of elevated water temperature than eggs from the more northern races. Myrick and Cech (2001) concluded that it appears unlikely that there is much variation among races with regard to egg thermal tolerance because data from studies on northern Chinook salmon races generally agree with those from California. They further concluded that fall-run Central Valley and northern Chinook salmon growth rates are similarly affected by water temperature.

In fact, the Myrick and Cech's 2004 study titled *Temperatures effects on juvenile anadromous salmonids in California's central valley: what don't we know?* noted that a recent study on Sacramento River Chinook salmon by the US Fish and Wildlife Service (1999) concurred that fall-run egg mortality increased at temperatures greater than 12ºC (53.6ºF), that winter-run egg mortality increased at temperatures over 13.3ºC (55.8ºF), and that temperatures between 6 and 12ºC appear best suited to Chinook salmon egg and larval development.

Chapter 6, page 2 of USBR's Biological Assessment (BA) for the 2008 Long-Term Operational Criteria and Plan for Coordination of the Central Valley Project and State Water Project (OCAP) contains Table 6-1 titled *Recommended water temperatures for all life stages of Chinook salmon in Central Valley streams as presented in Boles et al. (1988).* Recommended temperatures for Chinook salmon are migrating adult (<65ºF), holding adult (<60ºF), spawning (53-57.5ºF), egg incubation (<55ºF), juvenile rearing (53-57.5ºF) and smoltification (<64ºF). Table 6-2 (page 6-3) titled *Relationship between water temperature and mortality of Chinook salmon eggs and pre-*

emergent fry used in Reclamation egg mortality model shows that instantaneous daily salmon egg mortality begins at 57ºF and instantaneous daily pre-emergent fry mortality begins at 59ºF.

The NMFS 8 March 2012 Biological Opinion for DWR's proposed construction and operation of the South Delta Temporary Barriers Program acknowledges, at page 12, that the "upper preferred water temperature for spawning Chinook salmon is 55ºF to 57ºF (Chambers 1956, Smith 1973, Bjornn and Reiser 1991, and Snider 2001)" and the "optimal water temperature for egg incubation ranges from 41ºF to 56ºF (44ºF to 54ºF [Rich 1997], 46ºF to 56ºF [NMFS 1997 Winter-run Chinook salmon Recovery Plan], and 41ºF to 55.4ºF [Moyle 2002]). It noted a "significant reduction in egg viability occurs at water temperatures above 57.5ºF and total embryo mortality can occur at temperatures above 62ºF (NMFS 1997)."

The NMFS 4 June 2009, Chinook Salmon/Sturgeon Biological Opinion for OCAP establishes, on page 621, an RPA for specific temperature criteria to protect steelhead adult migration of (< 56ºF at Orange Blossom Bridge [OBB], 1 Oct – 31 Dec), smoltification (< 52ºF at Knights Ferry and < 57ºF at OBB, 1 Jan – 31 May), spawning and incubation (< 55ºF at OBB), 1 Jan - 31May) and juvenile rearing (< 65ºF, 1 June – 30 September). It states, "Temperature compliance shall be measured based on a seven-day average daily maximum temperature. While NMFS requires USBR to meet specific temperature criteria specified as a 7DADM on the Stanislaus River, it fails to require USBR to meet any specific temperature criteria on the Sacramento River; leaving it to the SRTTG to develop an annual flexible TMP based upon water available after USBR meets its contractor obligations.

The North Coast Regional Water Quality Control Board developed a Klamath River TMDL in 2010. As part of the process, staff conducted an extensive literature review to evaluate temperature needs of the various life stages of steelhead trout, coho salmon and Chinook salmon. The purpose of the review was to identify temperature thresholds that are protective of salmonids by life stage, as a basis for evaluating stream temperatures in California temperature TMDLs within the North Coast region. The results were reported in Appendix 4, Effects of Temperature, Dissolved Oxygen/Total Dissolved Gas, Ammonia, and pH on Salmonids of the Final Klamath River TMDL Staff Report. Table 13, on page 25 of Appendix 4 identifies life stage temperature thresholds for salmonid spawning, egg incubation and fry emergence as 13ºC (55.4ºF), expressed as a MWMT, which is the same as a 7DADM.

The Pacific Fishery Management Council, in a 29 May 2015 letter from its Executive Director Dr. D. O. McIsaac, to SWRCB Executive Director Tom Howard, recommended that the SWRCB insist that USBR actively manage to meet a 56ºF maximum temperature, rather than a 56ºF daily average.

The 2013 SRTTG annual report revealed that NMFS had broached the subject of switching to a 7DADM. It stated on page 12:

> NMFS expressed the idea of tracking the 7-day maximum (7DADM) water temperature in order to determine whether sub-lethal effects on salmonid life history stages (spawning, egg incubation and fry emergence) exist, despite the current temperature requirement metric of a daily average (Appendix B). *The*

> *7DADM metric is recommended by EPA as of 2003 and has been used in other Central Valley rivers (e.g., Stanislaus, Tuolumne, and Merced rivers).* NMFS looked at the 7DADM and what that might mean to the current daily average criterion (Figures 3-6). *7DADM can exceed daily average temperatures by as much as 4ºF at Balls Ferry and as much as 3ºF at Airport Road.* [Emphasis added.]

The report then observed that:

> *SRTTG indicated that a change in compliance metric would require considerable time and effort in negotiations among all of the agencies and the State Water Resources Control Board and a change to decision 90-5.* Emphasis added.

The SRTTG 2013 report then posed the question:

> *How does the Panel view using 7DADM as a measurement to consider potential sub-lethal effects on salmonid life history stages in lieu of daily average temperature?* Emphasis added.

CSPA poses two additional questions: has the SWRCB abdicated its regulatory and public trust responsibilities to the SRTTG and ceded its authority to those it is required to regulate and to the fishery agencies that have chaperoned the continued decline of Chinook salmon in the Sacramento River? Where in the CWA, ESA or the California Water Code is authority granted to USBR, NMFS, USFWS, CDFG, the Western Area Power Administration and the Hoopa Tribe to secretly decide what are the appropriate water quality criteria to protect beneficial uses?

The 2014 SRTTG annual report reiterated NMFS' recommendation but did not mention any discussion or decision related to pursuing a change to a 7DADM temperature standard from the present daily average. It stated on page 16:

> In 2013, NMFS expressed to the SRTTG the idea of tracking 7-day average of daily maximum water temperature in order to determine whether sub-lethal effects on salmonid life history stages (spawning, egg incubation, and fry emergency) exist, despite the current temperature requirement metric of daily average. As explained in Appendix B of the 2013 SRTTG Annual Report of Activities, daily average temperature does not consider the impacts of diurnal temperature changes and daily maximum temperature. The stressful impacts of higher water temperatures on salmonids are cumulative and positively correlated to the duration and severity of exposure. The longer the salmonid is exposed to thermal stress, the less chance it has for long-term survival. Sub-lethal effects from high water temperature can lead to delayed mortality due to reduced fry and smolt sizes from sub-optimal growth. These effects could result in reduced productivity of a stock and reduced population size. As the term suggests, 7-day average of daily maximum (7DADM) reflects an average of maximum temperatures that fish are exposed to in a week long period. Since this metric is oriented to daily maximum temperatures, it can be used to protect against acute and sub-lethal or chronic effects.

It then observed that:

> *7DADM was monitored for WY2014 and it was found that the reported 7DADM temperature was as much as 3ºF higher in the Sacramento above Clear Creek than was shown by the SWRCB's 56ºF average temperature criterion.* Emphasis added.

Violations of the Endangered Species Act

In enacting ESA, Congress stated that the purpose of the ESA is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved." 16 U.S.C. § 1531(b). As part of conserving endangered or threatened species, ESA prohibits the "taking" of any such listed species. 16 U.S.C. § 1538(a)(1)(B). A "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(9). To "harm" a listed species in the context of a "take" includes "[any] act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." 50 C.F.R. § 17.3 (1994). An indirect injury to a listed species through habitat modification also constitutes a "take." *Babbitt v. Sweet Home Chapter of Communities for A Great Oregon*, 515 U.S. 687 (1995). The 9th Circuit Court of Appeals ruled that "under Sweet Home, a habitat modification which significantly impairs the breeding and sheltering of a protected species amounts to 'harm' under the ESA." *Marbled Murrelet v Pacific Lumber Company*, 83 F.3d 1060 (9th Cir. 1996).

USBR has operated to a pattern and practice of delivering near normal water supplies in the early years of drought, depleting carryover storage and then relying on the SWRCB to weaken water quality standards. The SWRCB has operated to a pattern and practice of weakening water quality standards and thereby significantly degrading the habitat and impairing essential behavioral patterns, breeding, feeding, or sheltering of listed species. The SWRCB and USBR are in violation of the ESA.

As discussed at length above, USBR does not have discretion to curtail water deliveries to Sacramento Settlement Contractors to meet ESA requirements to comply with temperature requirements. The SWRCB has the authority but has refused to use it reduce water deliveries to Settlement Contractors in order to retain sufficient cold water storage necessary for temperature compliance. Both the SWRCB and USBR have failed to ensure compliance with the terms and conditions in the incidental take statement, i.e., that the reasonable and prudent measures in the RPAs and, consequently, are no longer in compliance with the ESA.

The BO does not address ESA section 7(a)(2) compliance for individual water supply contracts and, consequently, delivery of water that is "nondiscretionary" for the purposes of the ESA is not exempt from ESA section 9 take prohibitions. The SWRCB has sanctioned the illegal "take" of endangered species by the USBR and Sacramento Settlement Contractors.

Abundances of anadromous and pelagic species listed pursuant to the ESA have plummeted over the last few years to the point where they are facing the likelihood of imminent extinction. Over

this period, the SWRCB has acceded to multiple requests by USBR to weaken basic minimum standards adopted to protect listed species and their habitats and the fishery agencies have acquiesced in issuing concurrence letters, frequently within hours or several days of receiving TUCPs and Reinitiation of Consultation requests. These serial actions have seriously modified and degraded the habitat and impaired the breeding and sheltering of listed species to the point of impending extinction.

For example, a year after violations of temperature criteria had decimated the year classes of Sacramento Chinook salmon, a month and a half after identifying Sacramento winter-run Chinook salmon as one of the eight species in the nation "most at risk of extinction in the near future" and after it had stated than an increase in the temperature compliance target would result in adverse impacts to incubating winter-run eggs and alevin in redds and that 58ºF was identified in the scientific literature as lethal to incubating salmon eggs and emerging fry, the NMFS issued a concurrence letter claiming that that increasing the temperature target was consistent with the BO because "the plan provides a ***reasonable possibility*** that there will be ***some juvenile winter-run survival*** this year." [Emphasis added.] A reasonable possibility that some winter-run might survive is not an acceptable ESA legal standard.

Notwithstanding the letters of concurrence from USFWS, NMFS and CDFW that claim these actions are consistent with existing Biological Opinions, nothing in the ESA legally allows or justifies the SWRCB and USBR to further degrade the habitats of species lingering on the precipice of extinction. Collectively, the excuses, justifications and serial weakening of water quality criteria emanating from the secret SRTTG meetings while the fishery agencies remain embraced in denial as fisheries plummet toward extinction, surely constitute one of the saddest and most wretched spectacles we've ever witnessed and could be easily construed as an illegal conspiracy to defraud the public of public trust resources to the benefit of special interests.

Violations of the Public Trust and Article X of the California Constitution

Article X, Section 2 of the California Constitution provides that:

> The right to water or to the use of the flow of water in or from any natural stream or water course in this state is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water.

Because of this Constitutional requirement, the SWRCB must consider the reasonableness of a particular method of diversion of water when evaluating (or reevaluating) all permitted uses of water and the requirements controlling those uses. "The limitations of Art. X, Section 2 … apply to all water users of the state and serve as a limitation on every water right and method of diversion." See *Yuba River D-1644* at p. 29. USBR is a water user subject to Article X, Section 2 in the operation of its respective projects in the Central Valley. The SWRCB's responsibility under the reasonable use doctrine is illustrated in the recent summary of this doctrine by the First District Court of Appeal, in *Light v. SWRCB (2014) 226 Cal.App.4th 1463, 1479–80*:

> Water use by both riparian users and appropriators is constrained by the rule of reasonableness, which has been preserved in the state Constitution since 1928. (Cal. Const., art. X, § 2; hereafter Article X, Section 2.) ... As the Supreme Court recognized soon after Article X, Section 2 was added, the rule limiting water use to that reasonably necessary "appl[ies] to the use of all water, under whatever right the use may be enjoyed." (Peabody v. City of Vallejo (1935) 2 Cal.2d 351, 367–68 (Peabody).) The rule of reasonableness is now "the overriding principle governing the use of water in California." (People ex rel. State Water Resources Control Bd. v. Forni (1976) 54 Cal.App.3d 743, 750 (Forni).)
>
> California courts have never defined, nor as far as we have been able to determine, even attempted to define what constitutes an unreasonable use of water, perhaps because the reasonableness of any particular use depends largely on the circumstances. (Peabody, supra, 2 Cal.2d at p. 368.) "What may be a reasonable beneficial use, where water is present in excess of all needs, would not be a reasonable beneficial use in an area of great scarcity and great need. What is a beneficial use at one time may, because of changed conditions, become a waste of water at a later time." (Tulare Dist. v. Lindsay–Strathmore Dist. (1935) 3 Cal.2d 489, 567.) In this regard, the Joslin court commented, "Although, as we have said, what is a reasonable use of water depends on the circumstances of each case, such an inquiry cannot be resolved in vacuo isolated from statewide considerations of transcendent importance. Paramount among these, we see the ever increasing need for the conservation of water in this state, an inescapable reality of life quite apart from its express recognition in [Article X, Section 2]." ([Joslin v. Marin Municipal Water District (1967) 67 Cal.2d 132, 140 (Joslin)]; see similarly In re Waters of Long Valley Creek Stream System (1979) 25 Cal.3d 339, 354 ["it appears self-evident that the reasonableness of a riparian use cannot be determined without considering the effect of such use on all the needs of those in the stream system [citation], nor can it be made 'in vacuo isolated from statewide considerations of transcendent importance'"].) Few decisions have ruled on the reasonableness of a specific use of water, but in separate cases the Supreme Court has concluded, essentially as self-evident, that the use of water for the sole purpose of flooding the land to kill gophers and squirrels is unreasonable (Tulare Dist., at p. 568), as is the use of floodwaters solely to deposit sand and gravel on flooded land (Joslin, at p. 141.)

And the responsibility and authority of the SWRCB to prevent unreasonable use of water extends to all users, The Board's authority to prevent unreasonable or wasteful use of water extends to all users, regardless of the basis under which the users' water rights are held. ([*California Farm Bureau Federation vs. State Water Resources Control Board (2011) 51 Cal.4th 421, 429].)*

Considering the conditions of drought which are described in the "drought emergency" declared by Governor Brown - the curtailments of water rights, the serial waivers of D-1641 standards to protect fish and wildlife and water quality in the Delta watershed, and the continual weakening of temperature compliance requirements on the Sacramento River - it is time for the SWRCB to declare flood irrigation by agriculture during the drought emergency a waste and unreasonable use until the emergency is over.

If the SWRCB can require urban conservation, it can also require conservation in agriculture. As former SWRCB chief counsel and Delta Watermaster Craig Wilson put it "flood irrigating a field during drought can be considered unreasonable. Flood irrigation in the Sacramento Valley in particular is unreasonable when endangered salmon are facing extinction.

Alfalfa and irrigated pasture alone consumes 8.6 MAF of water in California and provides low net revenue and few jobs. The SWRCB can and must reduce the quantity of water allocated to irrigated pasture and low-value crops like alfalfa that use prodigious amounts of water and have very high "applied water" coefficients relative to other crops during the drought emergency. To continue this use is unreasonable and a waste of water, and must be stopped or reduced until the drought emergency is declared over.

The continued killing of threatened and endangered species by obsolete and non-protective export pumping facilities simply because the state and federal water contractors refuse to pay for new state-of-the-art fish screens is an unreasonable method of diversion. This is especially true when water diverted through those facilities deprives listed species of water and primary production necessary for survival. The SWRCB can and must curtail south Delta exports during the drought emergency until D-1641 water quality standards are met.

The SWRCB must also consider public trust issues in proceedings that concern water rights and water quality based on reserved jurisdiction or under the doctrine of reasonable use. The SWRCB may also modify permits of "the projects" that require the appropriator to reduce the quantity of exports. *United States v. SWRCB* (1986) 182 Cal.App. 3d 82, 124-131. The SWRCB has a complaint procedure that can exercise authority over both federal and state water projects by virtue of having state water rights permits issued by the Board.

The State's management responsibilities include broad discretion to promote trust uses, such as the continued survival Chinook salmon in the Sacramento River, provided the discretion is exercised consistent with constitutional and statutory constraints. *People v. California Fish Co.* (1913) 166 Cal. 576, 597. While the State has discretion to promote trust issues, the SWRCB has "an affirmative duty" to protect trust resources. See *Illinois Central Railroad v. Illinois,* 146 U.S. 387; and *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419 (The state may not abdicate its supervisory role any more than the state may abdicate its police power); see also Stevens, The Public Trust: *A Sovereign's Ancient Prerogative Becomes the People's Environmental Right,* 14 U.C. Davis Law Review 195, 223.

Fish and wildlife are natural resources unequivocally protected by state sovereignty, whereby ownership of the resource is reserved to the states. *Geer v. Connecticut,* (1896) 161 U.S. 519. The court in *Audubon v. Superior Court*, (1983) 33 Cal.3d. 419 held that "no one may obtain a vested right to undertake an act that is harmful to the trust." See also *SWRCB D-1644* (Yuba River) at page 29. The supremacy of the public trust over private individuals is reflected in a "judicial presumption against state or legislative alienation of trust resources." *People v. California Fish*; see also *Illinois Central v. Illinois* (1892) 146 U.S. 387; *Montana v. U.S.*, (1981) 450 U.S.544. Historically, state sovereign ownership was limited to "the traditional triad of uses" – commerce, navigation, and fishing.

However, in 1971 the California Supreme Court expanded the protected uses to cover the environment generally. *Marks v. Whitney* (1971) 6 Cal 3d. 251, 259-260. State sovereign ownership imposes restraints on the state's discretion regarding the use of navigable waters. The use of trust resources must be consistent with the general trust purposes or it is invalid. *State of California v. Superior Court* (Lyon) (1981) 29 Cal 3d. 210, 220-230; *Marks v. Whitney*, supra; *City of Long Beach v. Mansell*, (1970) 3 Cal 3d. 462, 482-485. Preservation of a public trust resource such as the Sacramento River and San Francisco Bay/Delta estuary is a legitimate disposition of the public trust resource, and is consistent with general trust purposes. Thus, tidelands and water may be burdened with a negative easement against any active use or disposition of the trust reserve. Id; *National Audubon*, supra; *State of California v. Superior Court* (Fogerty), (1981) 29 Cal 3d. 240, 249-250.

Consequently, the SWRCB has both the authority and responsibility under its reserved jurisdiction in the permits and licenses of the USBR, and under its continuing authority and responsibilities pursuant to the public trust and reasonableness doctrine to protect fisheries, public trust resources and beneficial uses. To protect those resources and uses, it approved, among other things, the Basin Plan and issued WR Order 90-05 to protect the Sacramento River and issued the Bay-Delta Plan and D-1641 to protect the Sacramento-San Joaquin Delta Estuary.

Unfortunately, the SWRCB has ignored reasonable use and public trust considerations in its decision-making. It failed to analyze, discuss or justify its decision to significantly weaken protection for Sacramento River fisheries as opposed to maintaining near 75% deliveries to Settlement Contractors in its 7 July 2015 Order. The Order is devoid of any analysis and discussion weighing the costs and benefits of sending public trust species into extinction versus fallowing cropland that will be replanted when rains return. There is no economic study of Sacramento Valley agricultural beneficial uses to determine which crops provide important employment and economic benefits relative to crops that require large quantities of water but provide low net economic return and few jobs. Nor is there any analysis of "health and safety" needs and urban uses as opposed to agricultural or environmental.

USBR's pattern and practice of delivering near normal water supplies in the early years of drought, depleting carryover storage and then relying on the SWRCB to weaken water quality standards established to protect public trust resources as successive dry years occur has been amply documented in multiple documents and TUCP proceedings over the last several years. The SWRCB has failed to establish minimum reservoir storage levels that ensure compliance with water quality standards protective of public trust resources. When successive dry years occur, it then routinely weakens those standards, with little regard to its public trust and constitutional obligations.

In WR Order 92-02, the SWRCB previously made clear that water necessary to comply with water quality standards is not available for delivery for consumptive purposes. It must now explain or justify why it now chooses to reallocate that water to the Sacramento Settlement Contractors. Weakening water quality objectives and requirements simply because USBR recklessly delivered water that was otherwise necessary to maintain sufficient carryover storage to comply with water quality objectives and to protect public trust resources and agricultural beneficial uses in the Delta is a violation of Public Trust Doctrine. To send fisheries into

extinction while continuing to supply water for low value crops like pasture and alfalfa is an unreasonable use of water and a violation of Public Trust Doctrine and the California Constitution.

It is not the SWRCB's responsibility or legal right to sacrifice public trust resources and the Sacramento River's beneficial uses in order to absolve USBR of the consequences of egregious mismanagement. If customers of water contractors are now suffering because USBR failed to exercise prudence and due diligence in water management and rashly delivered near normal water supplies in initial drought years with little thought that another dry year might occur, it is USBR and not the SWRCB that has the responsibility to alleviate the suffering it caused.

In Conclusion

We request that the SWRCB immediately use its public trust, constitutional and water rights authorities to reduce water deliveries to low valued crops that are further depleting already inadequate cold water reserves, to require USBR to modify operations to ensure that sufficient carryover reserves of cold water necessary to comply with CWA and Basin Plan temperature criteria remain in Shasta Reservoir, and to issue sanctions against USBR for its willful disregard for public trust resources and beneficial uses. We also request that the SWRCB accelerate the present review of Bay-Delta standards, including a comprehensive balancing of the public trust with competing uses, and provide us a response to our 13 August 2014 complaint regarding illegal diversion by DWR and USBR and petition to adjudicate Central Valley waters.

Thank you for your consideration. If you have questions or require clarification, please don't hesitate to contact us.

Sincerely,

Bill Jennings, Executive Director
California Sportfishing Protection Alliance

Enclosures

Cc:	Felicia Marcus	Steven Moore
	Frances Spivy-Weber	Tom Howard
	Tam M. Doduc	Michael George
	Dorene D'Adamo	