“There it is. Take it.”

Endangered Species and Water Management in the San Francisco Bay Delta

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ESA and Federalism
Autumn 2004-2005
Submitted January 21, 2005
The CALFED Bay-Delta agreement has resulted in several notable innovations in Endangered Species Act (ESA) compliance: the Environmental Water Account (EWA), multi-jurisdictional/multi-agency cooperation, and a focus on consensus. Though these approaches have many potential benefits, their implementation in the San Francisco Bay Delta (hereafter “the Delta”) leaves considerable room for improvement. The EWA is a flexible, responsive, policy-neutral tool, but it currently fails to internalize the costs of environmental protection to agricultural and urban water users. Focus on cooperation has allowed agencies to get things done, but the focus has perhaps been on projects that can happen rather than projects that need to happen. As a result, four years after CALFED began, the fish are little if any better off.

Changes in Delta management as a result of recent meetings (the Napa Agreement) call into question whether there can or will be any consensus at all going forward among the various groups.

California’s Natural and Manmade Water Management System

Mulholland saw that a burgeoning and thirsty Los Angeles would soon need much more water than it had available. After much maneuvering and politicking by himself and others, Mulholland realized the dream of opening a new water source by tapping into Eastern Sierra water from the Owens Valley. He personally organized and supervised up to 3,900 construction workers at a time to build the 233-mile Los Angeles Aqueduct over six years…. It was the largest and most difficult municipal engineering project in U.S. history at the time. After an elaborate ceremony on November 5, 1913, water was released from the aqueduct into the San Fernando Valley. Mulholland declared to exuberant crowds at the ceremony, “There it is. Take it.”

California’s water management strategy is intimately tied to its climate and topography. Because of the large temperature contrast between its land surface and the cool waters of the North Pacific, its summers are extremely dry. The state receives nearly all of its precipitation during the winter months. On average, approximately 200 million acre feet (MAF) of

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precipitation falls from December to March\(^2\). Most of this precipitation is deposited in the Sierra Nevada and Southern Cascade mountain ranges as snow. Before the construction of the state’s water projects, natural drainage carried this water down the major river systems of the state—the Sacramento to the north and the San Joaquin to the south—through the San Francisco Bay Delta and out to sea (Figure 1A). The natural reservoir storage provided by the Sierra Nevada snowpack meant that both rivers had significant flows well into the summer months. Water projects have now dammed the main stems (and most tributaries) of the Sacramento and San Joaquin rivers (Figure 1B).

![Figure 1: California’s rivers and water projects. (A) California’s major rivers; (B) California’s state, federal, and locally operated water projects; (C) The San Francisco Bay-Delta and its major water project facilities.](image)

These dams augment the natural delay in the runoff of winter precipitation, creating a steadier flow of year-round water. They also control the catastrophic annual floods that used to occur in the Delta, now home to the state capital, Sacramento, as well as the most rapidly


\(^4\) California Department of Water Resources supra note 1 at 2.

\(^5\) Zachary P. Hymanson, California Bay-Delta Authority, Fulfilling a paradoxical mandate: An evaluation of efforts to reduce delta smelt (*Hypomesis transpacificus*) export entrainment loss while simultaneously ensuring the
growing municipalities in California. Of the 200 MAF of precipitation that California receives each year, 130 MAF is consumed by evaporation and transpiration by plants, leaving 70 MAF as runoff. 40 MAF of this runoff is actively managed to provide a steady year round supply of water to Californias farms and municipalities as well as to mitigate spring floods caused by rapid melt of the snowpack\(^6\).

Both agricultural and municipal water supplies are crucial to the state. California’s Central Valley is the United States’ most productive agricultural region. It represents less than 1% of the total U.S. farmland but produces 8% (by value) of US farm products (Total value in 2003: $27.8 billion)\(^7\). Without extensive development both of irrigation and flood control, none of this agriculture would be possible. Fields would be under water when they weren’t bone dry.

California is the most populous state in the nation; it now has more than 37 million residents. The vast majority live near the coast in municipalities with grossly insufficient water supplies. When the population of California was smaller, the tradeoffs between water used for agriculture, for municipalities and industry, and for native species of fish was less stark. As the population of California has grown, these three uses have had to fight harder to get their “fair” share of the water supply. Irrigated agriculture currently uses nearly 80% of the managed water supply. Municipalities use another 16%. Environmental uses of water in the managed watersheds of the Central Valley thus account for the tiny proportion remaining\(^8\).

Withdrawals for agriculture and municipalities are only one of the major challenges for California’s highly managed ecosystems. The other is that the massive volume of water needed

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\(^6\) CALIFORNIA DEPARTMENT OF WATER RESOURCES supra note 1 at 1.
\(^7\) CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE, CALIFORNIA AGRICULTURAL STATISTICS 2003 (October 2004) available at [http://www.edfa.ca.gov/card/card_new03.htm](http://www.edfa.ca.gov/card/card_new03.htm) (last visited on Jan 20, 2005).
for those uses must be transported from the places where it falls to the places where it is needed. Since most of the farming and the majority of the urban population is located south of the Delta, a large proportion of the water must be transported from the north of the state to the south. This transport is accomplished by releasing water from dams in the foothills of the Northern Sierra Nevada, allowing it to flow down the Sacramento River into the San Francisco Bay Delta, where it is then pumped into aqueducts that transport it to the southern half of the state (Figure 1C). The transit of water across the Delta greatly perturbs its natural flow patterns and poses significant challenges for wildlife. The pumping plants themselves are also a major threat to any fish that stray too close to pump intakes.

The massive infrastructure necessary to capture and utilize California’s water supply was developed as two separate projects, one owned and operated by the State (the State Water Project, or SWP) and one by the Federal government (the Central Valley Project, or CVP). The SWP was built and is operated by the California Department of Water Resources (hereinafter the DWR). Construction of the SWP began in 1957. The Oroville-Thermalito Complex, the hub of the SWP, was completed in 1968. The complex consists of a series of dams across the Feather River, a major tributary of the Sacramento (Figure 1B). Today the SWP delivers approximately 3 MAF to its contractors. The CVP is operated jointly by the Army Corps of Engineers and the U.S. Bureau of Reclamation (hereinafter the Bureau). Construction began in 1937; the CVP’s centerpiece, Shasta Dam, was completed in 1945 (Figure 1B). Today the CVP delivers


approximately 7 MAF to agricultural and municipal customers. The CVP and SWP are operated cooperatively. They also share major facilities, including the San Luis Reservoir, the major water storage reservoir south of the Delta.

As California municipalities’ water usage has increased (Figure 2), the effects of the CVP and SWP on the hydrology and biology of California’s rivers and the Delta have grown more intense.

![Trends in Flow](image)

**Figure 2.** Trends in the percentage of inflows to the Sacramento-San Joaquin Delta that were either exported via the state and federal pumping facilities or flowed out to San Francisco Bay. Beginning in 1994, Delta outflows and exports were regulated by the San Francisco Bay-Delta Agreement.

Increased withdrawals by the CVP and SWP have significantly reduced wintertime flows in the Sacramento River and its tributaries, dramatically altered patterns of flow in the Delta, and

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12 CALIFORNIA DEPARTMENT OF WATER RESOURCES, supra note 10.
increased salinity values in the Delta as salt water from San Francisco Bay moves in to replace freshwater exports. All of these effects represent serious threats to fish that live in or attempt to travel through the Sacramento River and the Delta. These effects, combined with the multi-year droughts that occurred in 1976-77 and 1987-1992, pushed several fish species that had been in decline to the brink of extinction.

**Endangered Fish of the San Francisco Bay Delta**

**Sacramento River Winter-Run and Central Valley Spring-Run Chinook Salmon**

The Chinook Salmon is one of nine species of salmon inhabiting the North Pacific and the rivers that feed into it. It is the largest of the salmon species with adults occasionally exceeding 50 lbs. Salmon are anadromous fish; they are born in fresh water and spend some period of their lives maturing there before migrating out to sea during adolescence. They live at sea for most of their lives before returning to their natal stream at which time they achieve sexual maturity, reproduce, and die.\(^{15}\)

There are two major life-history types of Chinook Salmon, ocean-type and stream-type. Ocean-type salmon spend approximately six months in fresh water before emigrating to the ocean. Once there, they tend to forage in nearby coastal waters during their adolescence. In contrast, stream-type salmon spend more than a year foraging in fresh water before entering the ocean. Once in salt water, they typically live in the open North Pacific. Both of the endangered runs of Central Valley salmon are of the ocean-type.\(^{16}\)

Runs of salmon, even when they reproduce in the same stream, are genetically isolated by the time of year at which they reproduce. A recent microsatellite DNA study demonstrated that

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\(^{16}\) Id.
the Spring-Run was actually composed of two genetically distinct populations, each of which is also distinct from the Winter-Run.17

Prior to the construction of Shasta and Keswick Dams, Winter-Run Chinook spawned in the upper spring-fed tributaries of the Sacramento River near Mt. Shasta18. Spring-Run Chinook spawned at lower elevations in the Sacramento River and in its tributaries19. Then as now, Winter-Run Chinook leave the ocean in November through January and proceed quickly upstream to hold in the area downstream of Keswick Dam. Spawning occurs from April through August with a peak in late May and early June20. Spring-Run Chinook leave the ocean slightly later, in January and February, swim much less quickly upstream, and hold in their natal streams for a shorter interval before spawning in August through October.21 Today, both Winter-Run and the Spring-Run Chinook spawn in the reach of the Sacramento River downstream from Keswick Dam. The Spring-Run also spawns in Battle, Deer, and Butte Creeks, tributaries of the Sacramento downstream of Keswick Dam.22 Both runs of Chinook typically return to their natal streams to reproduce and die when they are in their third year of life. Thus there are three year-classes of fish in each run. Some variability in year of return produces gene flow between year classes.

The quality of fresh water habitat available for adult salmon as they swim upstream and reproduce as well as the environment in which the eggs, larvae, and smolts develop are critical for reproductive success. Important factors include cool water temperatures (<56°F), adequate flows in rivers, and relatively stable flows so previously submerged redds (the gravel beds where

17 M.A. Banks et al., Analysis of microsatellite DNA resolves genetic structure and diversity of Chinook Salmon (Oncorhynchus tshawytscha) in California’s Central Valley, 57 CAN. J FISH AQUAT SCI 915 (2000), 915-27.
18 U.S. FISH AND WILDLIFE SERVICE, supra note 16 at 53.
19 Id. at 56.
20 Id. at 50.
21 Id.
22 Id. at 54, 56.
salmon lay their eggs) are not exposed and juvenile fish are not stranded in the shallow reaches where they tend to forage. High quality redds must also be available, which requires adequate replenishment of gravel during winter storm events. Finally, a clear directionality of the river in which they are swimming is critical to the success of out-migrating juveniles – downcurrent must lead to the ocean\textsuperscript{23}.

All of these requirements have been upset by the major California water projects. Prior to listing, water temperatures in the spawning reaches of the Sacramento and its tributaries routinely exceeded 56°F during the summer and fall months when Chinook are present. This led to high adult mortality and low fertility among those adults that did survive. Dams were operated solely to maximize power generation and deliver water to downstream users. This led to very low flows during summer months interspersed with rapid increases and decreases when deliveries were made. The construction of dams also blocked the supply of gravel from the Sierra Nevada and Cascade ranges so that over time, redd quality declined significantly. Finally, the operation of the Delta pumps, combined with low inflows to the Delta, frequently created conditions in which flow in the Delta was toward the pumps rather than towards San Francisco Bay and the Pacific. This led to out-migrating smolts straying out of the Sacramento and into the South Delta and eventually the pump intakes\textsuperscript{24}.

These factors, when combined with fishing operations in the coastal and open North Pacific, led to gradual declines in Winter-Run and Spring-Run Chinook populations ever since data has been collected (Figure 3) punctuated by major decreases subsequent to the multi-year drought of 1976-77 and 1987-92. Populations are currently surveyed in two ways. First by counting fish that pass the fish ladders at Red Bluff Diversion Dam; second by surveying redds

\textsuperscript{23} Id. at 51.
\textsuperscript{24} Id. at 55, 57.
for fish carcasses. Both methods rely on an estimate of the reproductive fitness of the adult fish in order to estimate the out-migrating fry and smolt population that will be vulnerable to the Delta pumps. Currently, the redd counting method is thought to be more reliable because the Red Bluff Diversion Dam gates are raised, allowing fish passage in the river, during almost all of the Winter-Run and some of the Spring-Run\textsuperscript{26}.

Listing and Critical Habitat History

Sacramento River Winter-Run Chinook Salmon were listed as threatened in August 1989 under the emergency listing provision of the ESA. This listing was formalized in November 1990\textsuperscript{27}. Critical habitat for the Winter-Run Chinook was designated in June of 1993\textsuperscript{28}.

\textsuperscript{25} reprint from Native Anadromous Fish and Watershed Branch, California Department of Fish and Game, Sacramento River Winter-Run Chinook Salmon, Biennial Report, 2002-2003, 20 (June 2004).

\textsuperscript{26} Telephone Interview with Jim White, Staff Environmental Scientist, California Department of Fish and Game (Jan. 7, 2005).

\textsuperscript{27} Endangered and Threatened Species; Sacramento River Winter-Run Chinook Salmon, 55 Fed. Reg. 46,515 (Nov. 5, 1990).
habitat was designated as the Sacramento River from Chipps Island (mile 0) to Keswick Dam (mile 302), Suisun and San Pablo Bays, and San Francisco Bay north of the Bay Bridge. In January of 1994, as a result of population declines, increased run size variability, and a 99% decline between 1966 and 1991, Winter-Run Chinook were reclassified as endangered\textsuperscript{29}. In June of 2004, NOAA Fisheries proposed upgrading Winter-Run Chinook to threatened status\textsuperscript{30}. NOAA Fisheries justifies their proposal by pointing to increased abundance of the fish, artificial propagation programs, and CALFED ecosystem restoration efforts in Battle Creek that should lead to a second Winter-Run Chinook population.

Central Valley Spring-Run Chinook were listed as threatened in September of 1999\textsuperscript{31}. Critical habitat has yet to be designated for the Spring-Run. In December of 2004, NOAA Fisheries proposed critical habitat for the Central Valley Spring-Run Chinook\textsuperscript{32}. The proposal includes the all of the areas in the Winter-Run critical habitat plus numerous tributaries of the Sacramento including but not limited to Battle, Butte, and Deer Creeks.

**Delta Smelt**

The Delta Smelt (*Hypomesus transpacificus*) is the only smelt species endemic to California; the species is found exclusively in the Sacramento-San Joaquin Estuary. Once one of the most abundant fish species in the Estuary, smelt populations have decreased by nearly 90

\textsuperscript{28} Designated Critical Habitat; Sacramento River Winter-Run Chinook Salmon, 58 Fed. Reg. 33212 (Jun. 16, 1993).
\textsuperscript{29} Endangered and Threatened Species; Sacramento River Winter-Run Chinook Salmon, 59 Fed. Reg. 440 (Jan. 4, 1994)
\textsuperscript{30} Endangered and Threatened Species; Proposed Listing Determinations for 27 ESUs of West Coast Salmonids, 69 FR 33,102 (June 14, 2004).
\textsuperscript{31} Endangered and Threatened Species; Threatened Status for two Chinook Salmon Evolutionarily Significant Units (ESUs) in California, 64 Fed. Reg. 50,394 (Sep. 16, 1999).
percent in the last 20 years. The Delta Smelt is a euryhaline species, adapted to fresh and/or 
brackish water, rarely appearing in water with salinity greater than 2 ppt. The fish spawn in the 
shallow freshwater of the San Joaquin and Sacramento Rivers in the winter and spring and feed in 
Suisun Bay during the summer and autumn. Smelt are particularly vulnerable to population 
pressures due to their short lifespan (approximately one year), low fecundity rates, exclusive diet 
(zooplankton), and salinity requirements.

The smelt are particularly vulnerable to changes in water flow. Too little water depresses the 
population in the following ways. Transportation: too little water prevents the smelt from 
traveling upstream to spawn or downstream to feed. Food: lower water levels shift the mixing 
zone (of brackish water) upstream to deeper, less productive river channels, instead of the 
shallower areas of Suisun Bay. Salinity: lower water flows mean increased salinity, which 
affects the availability of food sources, increases the population of nonindigenous aquatic 
species, and hinders the instigation of natural processes. Navigation and entrainment: smelt are 
poor swimmers and range in size from 2-3 inches as juveniles and adults; this makes them 
susceptible to entrainment in Delta pumping stations. Reverse flows disorient juveniles, 
leading to increased mortality due to entrainment and predation by striped bass at pumping 
stations. Water exports from the Delta coincide with the smelt’s spawning season, exacerbating 
the problem.

33 Ryan Olah and Michael Nepstad, U.S. Fish and Wildlife Service, 5-Year Review of Hypomesus 
34 Id. at 5.
35 Id. at 3.
36 Id. at 5.
37 Id. at 27.
38 Id. at 4.
Too much water also harms the smelt population. Excess rain in 1995 resulted in juveniles being flushed out into San Francisco Bay, where food sources were scarce and salinity was too great\textsuperscript{39}.

Unfortunately for the smelt, competition for fresh water is intense. This threat is the main threat to the continued survival of the species.

**Listing History**

The Delta Smelt was listed as a threatened species March 5, 1993\textsuperscript{40}. Critical habitat was designated a year later, on December 19, 1994\textsuperscript{41}. The critical habitat included all water and submerged lands bounded by and contained in Suisun Bay (including contiguous bays) and the Sacramento/San Joaquin River Delta\textsuperscript{42}. This habitat spans 5 California counties: Contra Costa, Sacramento, San Joaquin, Solano, and Yolo (Figure 4).

The critical habitat designation isolated several key factors essential to the recovery of the species. Maintenance of salinity was deemed necessary to prevent incursion of opportunistic species, to promote abundance of phytoplankton and zooplankton, and to aid in the stimulation of natural processes. The Delta Smelt also has particular needs for various points during its lifecycle. During spawning, smelt need hard substrate materials to which eggs can attach themselves (e.g. rocks and roots), in shallow, non-polluted, fresh (or slightly brackish) water. After birth, water flow in the rivers must be adequate to transport smelt both to the mixing zone in Suisun Bay and to carry them back to the spawning areas further up river. 59 FR 65260.

\textsuperscript{39} California Dept. of Fish and Game, *Delta Smelt*, at [http://www.delta.dfg.ca.gov/gallery/dsmelt.asp](http://www.delta.dfg.ca.gov/gallery/dsmelt.asp) (last visited 10/7/04).
\textsuperscript{40} Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Delta Smelt, 58 Fed. Reg. 12,854 (Mar. 5, 1993).
\textsuperscript{42} *Id.*
Population history

Population history with the Delta Smelt relies on data “collected incidental to other investigations [such as population studies of the striped bass, among others] and were not intended to provide a population estimate.” Although the Final Report noted problems with data, by the 5-year Review ten years later, little had changed. As the review authors noted, “There presently is no survey which provides data which can be used for population estimates. All of the surveys described below provide limited data on seasonal distribution and abundance for a portion of the smelt life history.”

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44 supra note 40 at 12,681.
45 5-year Review supra note 33 at 2.
would suggest that Delta Smelt populations are increasing over pre-decline levels. Population estimates are based on abundance indices, which are, themselves, imprecise due to the areas the fish inhabit (shallow, rather than deep water), uneven (patchy) distribution within the habitat, and the presence of other species (rather than concentrated schools of smelt). Smelt were hit particularly hard by drought between 1987-1992, recovered to pre-drought levels in 1993, and then recorded their all-time lowest abundance levels in 1994. (Figure 5) This shows the vulnerability of the population to threats which neutralize population increases. The 5-year Review concludes that, despite variance in abundance indices, the population is trending downward. Indeed, the 2003 two-year running average of the Delta Smelt Recovery Index was the second lowest since the species was listed. The 5-year Review also notes that “sufficient

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46 Id. at 17.
47 Id. at 17-18.
48 Id. at 1.
49 Id. at 48.
50 Id. at 1.
51 Id. at 27.
legal mechanisms and interagency agreements are not in place to assure removal of many of the threat[s]”52, including water outflow and diversions.53

The Consequences of Listing for Water Management

Listing under the Endangered Species Act effectively put federal wildlife management agencies in control of Delta pumping plants—which, in turn, put the ESA at the center of California’s water management. Because of the federal ownership of most of the water management facilities in California and the close cooperation between the CVP and the SWP in operation of their projects, the mandates of the ESA on federal agency action are central to protection of the Delta Smelt, Winter- and Spring-Run Chinook. Upon listing, pump operations, the largest known killers of these endangered fish, had to be managed in a manner that would minimize harm to endangered species. §7(a)(2) of the ESA requires that each federal agency must, in consultation with the federal wildlife management agencies, insure that its actions are not likely to jeopardize the continued existence of any species listed as endangered or threatened under the act.54 If the agency’s actions are likely to result in incidental take of a listed species or in adverse modification of its habitat, the agency is required to take actions suggested by the wildlife management agency that will mitigate the effects of the agency action on the endangered species.55 Thus, upon a finding of jeopardy for the endangered smelt and salmon, the FWS and NOAA fisheries were required to outline “reasonable and prudent alternative[s]” to the plan of operations suggested by the Bureau for the CVP and for its cooperation with the SWP that would not jeopardize the continued existence of the fish.56

52 Id. at 21.
53 Id. at 21-23.
55 ESA §7(b)(3).
56 Id.
Mitigation Actions Taken Subsequent to Listing but Prior to CALFED

Prior to the advent of the CALFED program, important actions were taken on the part of
the U.S. Fish and Wildlife Service (hereinafter FWS), NOAA Fisheries, the California State
Water Resources Control Board (SWRCB) and the project operators that helped to improve the
environment in the San Francisco Bay Delta and Sacramento River ecosystems. These changes,
along with relatively high precipitation from 1994 to 2000, led to significant improvements in
the Winter-Run Chinook and Delta Smelt populations. First, in 1992, Congress passed the
Central Valley Project Improvement Act. This amended the authority of the CVP to give fish
and wildlife equal priority with other project objectives. The CVPIA also established an 800
Thousand Acre Foot (TAF) allotment of water for the protection of fish and wildlife. Known as
B2 water, after §3406(b)(2) of the CVPIA, this water was to be utilized in cooperation with the
FWS, NOAA, and state agencies in implementing habitat restoration efforts and to help the CVP
meet its future obligations under the ESA. This water was immediately put to use in helping to
increase and stabilize flows on the Sacramento and other CVP managed rivers, to reduce
temperatures in the spawning reach of the Sacramento, and to reduce salinity in the Delta.

After the introduction of B2 water, NOAA fisheries issued its first ESA §7 opinion on
CVP operations. This opinion required that the CVP adopt reasonable, prudent alternatives to
its then current operation by maintaining temperature and flow requirements in the Sacramento
River. Then, in May of 1995, the SWRCB issued its Water Quality Control Plan for the
Sacramento-San Joaquin Delta Estuary. This plan was also incorporated into a key water rights

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58 NATIONAL MARINE FISHERIES SERVICE, BIOLOGICAL OPINION FOR THE OPERATION OF THE FEDERAL CENTRAL
VALLEY PROJECT AND THE CALIFORNIA STATE WATER PROJECT (1993) [hereinafter NMFS BO 1993]
decision in 1999. The plan mandated that the CVP construct and employ a temperature control device (TCD) at Shasta Dam. The TCD would allow releases from Shasta to come from deep in the reservoir’s water column where temperatures were low enough to meet the temperature criteria laid out in the 1993 NOAA biological opinion. The SWRCB water quality control plan also mandated Delta outflow requirements, river flow requirements, export limits, and controls on delta gate closures, all for the purposes of protecting fish and wildlife. Finally, in 1996, NOAA Fisheries sharply curtailed ocean harvest of Winter-Run Chinook Salmon. All of these actions are thought to have had a beneficial impact on Delta Smelt and Winter-Run Chinook Salmon. Indeed, Bruce Oppenheim, a NOAA Fisheries biologist responsible for Central Valley Chinook argues that these actions were far more significant in increasing the abundances of endangered fish than the environmental programs implemented by CALFED.

Between the time the Winter-Run Chinook and Delta Smelt were listed and the CALFED Record of Decision (hereinafter CALFED ROD), however, water contractors south of the Delta faced uncertainty about the timing and amount of water deliveries. The Tracy and Banks pumping plants in the south Delta (Figure 1C) were shut down (and exports halted) by NOAA and FWS when high levels of incidental take of salmon and smelt were observed. This led to uncertainty as to the timing and amount of water deliveries for south of the Delta CVP and SWP water contractors. This uncertainty in turn led to a desire for a new plan, one that would

59 California State Water Resources Control Board, Decision 1641, In the matter of implementation of water quality objectives for the San Francisco Bay/Sacramento-San Joaquin Delta; petition to change the POD for the Central Valley Project and State Water Project in the southern delta; petition for change in place of use and purpose of use of the Central Valley project (Dec. 29, 1999) available at http://www.waterrights.ca.gov/hearings/d1600_d1649.html (last visited Jan. 21, 2005).


61 Telephone Interview with Bruce Oppenheim, Biologist, Protected Resources Division, Southwest Region, NOAA Fisheries (Jan. 6, 2005) [hereinafter, Interview with Oppenheim].
incorporate increased fish protections alongside better system reliability. The result was the CALFED Bay-Delta Accord.

The Bay-Delta Accords

Once Delta Smelt and Winter-Run Chinook Salmon were listed under the ESA, FWS and NOAA Fisheries were required by law to prevent incidental take that might jeopardize their continued existence. Unfortunately for the CVP and the SWP, the most visible way in which endangered fish are taken in the Bay-Delta or the Sacramento River is by being drawn into the intakes to the Banks or Tracy pumping plants in the southern Delta (Figure 1C). These pumps are a critical part of the projects’ infrastructure because they allow water to be transported south of the Delta to the many municipal and agricultural contractors who reside there. Essentially, if the take at the pumping stations exceeded allowable limits, set at 0.5% of the estimated population size for Chinook or Smelt, NMFS and/or FWS could order export curtailments (a reduction in pumping). If take exceeded 1%, the pumps were shut down entirely. Export curtailments caused project deliveries to be less than expected for south of Delta contractors. This uncertainty led to the realization amongst all stakeholders that cooperative action to improve the situation of the endangered fisheries was necessary if the reliability of California’s water delivery systems was to be assured. Business as usual was no longer sustainable.

This realization led in 1994 to the Framework Agreement for Establishing CALFED and the San Francisco Bay-Delta Agreement, which instituted interim water quality and ESA actions while the final CALFED agreement was negotiated. The Framework represented a commitment on the part of all stakeholders to attempt to achieve consensus on a solution to

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NATIONAL MARINE FISHERIES SERVICE, supra note 58 at 73.

California’s water problems. One key component of the Agreement with regard to endangered fish was that compliance with ESA requirements would result in no additional loss of water supply to the contractors beyond the level agreed to in the Agreement’s various provisions for endangered species and Bay-Delta water quality. Another, perhaps equally important component was a commitment by all parties to utilize the best available science in their decision making and management of the CVP and SWP.

During the six years it took to negotiate the CALFED ROD, California was blessed with relatively abundant precipitation, including a large El Niño event, that significantly eased what were already difficult negotiations. The CALFED ROD, signed in 2000, ratified a long-term plan for management of California’s water resources that sought to balance four goals: water quality, system reliability, levee integrity, and ecosystem restoration. Inclusion of all of these goals was necessary to achieve consensus amongst a diverse group of stakeholders that included wildlife management agencies, the project operators and contractors, in-Delta water users, and environmentalists. Although CALFED was supposed to be financed equally by the State, the federal government, and the water users, the bulk of CALFED’s initial funding was provided by California Propositions 204 and 50. Because the state is the only one of the three groups that has come through with all of the funds it promised, CALFED has faced a budget shortfall in its first 4 years of operation of approximately $1.1 B (30%).

Even with mostly adequate funding, accomplishing all of the CALFED goals has required a confusing array of programs. The two programs instituted by the CALFED ROD

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64 San Francisco Bay-Delta Agreement (1994), at http://calwater.ca.gov/Archives/GeneralArchive/SanFranciscoBayDeltaAgreement.shtml (last visited 1/18/05).
65 Telephone Interview with Teresa Geimer, Chief, Water Project Planning Branch, State Water Project Analysis Office, California Department of Water Resources (Jan. 7, 2005) [hereinafter, Geimer Interview].
66 CALFED Record of Decision (2000), at http://calwater.ca.gov/CALFEDDocuments/CALFEDDocuments.shtml (last visited 1/18/05) [hereinafter CALFED ROD].
specifically designed to benefit fish were the Ecosystem Restoration Program (ERP) and the Environmental Water Account (EWA)\textsuperscript{68}.

The Ecosystem Restoration Program, as its name suggests, has been largely involved in the restoration of Delta and river habitat for the benefit of endangered fish and other species. One small component of the program, the Environmental Water Program, has attempted to purchase water rights in smaller tributaries of the Sacramento or San Joaquin Rivers that have been identified as good candidates for reintroduction of Chinook Salmon. This program, to date, has purchased no water. This lack of progress is largely the result of an inability to identify watersheds that have potentially good spawning habitat and willing sellers of rights to sufficient water. Both technical staff at NOAA as well as environmental activists involved in the CALFED process believe that if an effective EWP program can be initiated, it may well hold the key to restoring healthy runs of Chinook Salmon in the Central Valley.\textsuperscript{69} In contrast to the EWP’s sluggish start, the EWA, a program intended to insure system reliability and provide water for fish by creating a virtual water district run by a team of project operator and wildlife management technical staff, purchased and used water in its first year of operation.

\textbf{The Environmental Water Account (EWA)}

The EWA was designed to give fish agencies a flexible, easily administrable way to protect endangered species. The EWA gives agencies a set amount of water they can use per year. At the agencies’ discretion, pumps in the Delta can be shut down for the benefit of the fish. EWA water is then delivered to water users in lieu of the water that would’ve been pumped from the Delta. The EWA, therefore, allows the agencies to apply water assets whenever they want to,

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\footnote{\textsuperscript{67} California Legislative Analyst’s Office, \textit{CALFED Bay-Delta Program: At a Funding Crossroads} (2004), at \url{http://www.lao.ca.gov/analysis_2004/resources/res_02_cc_calfed_anl04.htm} (last visited 1/18/05).}
\footnote{\textsuperscript{68} CALFED ROD, \textit{supra} note 66 at 35, 54.}
\end{footnotes}
and ensures water supply reliability by avoiding uncompensated pump shutdowns. The response is rapid—EWA administrators need not conduct lengthy hearings or litigate over regulations that would deprive users of water. From a fish management perspective, the idea behind the EWA was to give the agencies the most benefit for the least amount of water—stopping pump activity quickly when fish were in danger of being sucked into the pumps and/or when water was needed for fish transportation purposes. The EWA had an added benefit—by giving the agencies a fixed budget of water, the agencies would internalize the costs of each intervention. In other words, regulation has no budget. Under the fixed budgets of the EWA, the agencies would be forced to intervene only when their actions had maximal effect.

According to David Fullerton, architect of the EWA, the original size of the EWA allocation was set in accordance with ESA goals. Planners ran a series of gaming simulations based on hydrology data from 1981-1994. The simulation ran through the fourteen year period and allowed fish agencies to try different formulations: timing, size, and storage. In Fullerton’s opinion, the size of the EWA was set according to professional judgment: “there was not a lot of science behind it.”

The assets are supposed to be 380 TAF/year on average. CALFED ROD at 58.

The EWA was intended to function in six major ways. First, EWA assets were to be used to put “shoulders” on the Vernalis Adaptive Management Program (VAMP), the large releases of water by Shasta Dam in April and May that are intended to help flush outmigrating salmon into San Francisco Bay and away from Delta pumps. EWA water would be released from the Oroville-Thermalito Complex before and after the VAMP, making flow changes more gradual in

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69 Oppenheim Interview, supra note 61; telephone Interview with Tina Swanson, Senior Scientist, The Bay Institute (Jan. 7, 2005) [hereinafter, Swanson Interview].

70 Telephone Interview with David Fullerton, Metropolitan Water District of Southern California (Jan 5, 2005) [hereinafter Fullerton Interview, Jan. 5].
the Sacramento and slightly lengthening its effective duration so as not to strand fish. Second, the EWA acquired the right to 50% of any excess pumping capacity at the SWP pumping facility (with the CVP retaining the other half). Third, the EWA received the right to 500 cubic feet per second (cfs) of SWP pumping capacity. Fourth, the EWA received the right to relax the Delta Export/Inflow ratio requirements contained in SWRCB D-1641 when fish were not endangered by this action in order to acquire additional water assets. Fifth, the EWA was given the right to excess storage capacity in San Luis Reservoir, located to the south of the Delta and just upstream of the Oneil Forebay, the major point at which assets are exchanged between the CVP and the SWP. Finally, the EWA was to be allocated money to purchase water from willing sellers both to the north and the south of the Delta. It is important to note that the EWA’s ability to use many of its assets is dependent upon either the availability of water or excess pumping capacity. To the extent that either one of these is unavailable, the EWA’s effectiveness is curtailed.\footnote{Id.\footnote{Attachment 2, Environmental Water Account Operating Principles Agreement, CALFED ROD (2000), 11-14 [hereinafter CALFED ROD Attachment 2].}}

The first four years of the EWA have shown how sensitivities to capacity can be important, in ways largely unforeseen by planners. The EWA has had a difficult time acquiring excess pumping capacity because of two major factors. First, the last four water years have been relatively dry. This has meant less pumping capacity on average because there have been smaller unregulated flows into the Delta. Second, the Metropolitan Water District of Southern California (“MWD”) completed construction of the 800 TAF Diamond Valley Dam and Reservoir during this time interval and has exercised its rights to pumping capacity in order to fill the reservoir, thus leaving less “excess” for the EWA. Given that Diamond Valley is now full and that the
2005 water year looks to be relatively wet, the fifth year of the EWA will be the first in which neither availability nor storage is likely to limit pumping.\footnote{Interview with Geimer, \textit{supra} note 65.}

In the meantime, the size of the EWA budget is decreasing. In year one, the program spent $64 M to acquire 384 TAF of water.\footnote{California Department of Water Resources, \textit{Environmental Water Account Water Acquisitions, Fiscal Year 2000-01} (Mar. 30, 2004), at \url{http://www.watertransfers.water.ca.gov/water_trans/water_trans_index.cfm} (last visited Jan. 21, 2005).} In year four, the program spent $19.6 M to acquire 155 TAF of water.\footnote{California Department of Water Resources, \textit{Environmental Water Account Water Acquisitions, Fiscal Year 2003-04} (August 22, 2004), at \url{http://www.watertransfers.water.ca.gov/water_trans/water_trans_index.cfm} (last visited Jan. 21, 2005).} This reduction was related to an improved understanding of how to utilize the EWA and to reductions in funding by the state. In the opinion of Teresa Geimer, Chief of the Water Transfers and Special Projects Branch at DWR, water purchases during the first year were excessive given the other (pumping and storage) related limitations on the program.\footnote{Interview with Geimer, \textit{supra} note 65.} As the operators of the EWA have gained practical experience in its implementation, they have scaled back purchases to better reflect their ability to both transport water across the Delta and to store it south of the Delta.\footnote{\textit{Id}.}

Geimer is particularly frustrated by the lack of adequate storage capacity south of the Delta. This storage is essential if the EWA is to prove effective because water must be transported south and then held there to be released when it proves necessary to shut down the Delta pumps. Given the budget constraints of the EWA, all storage options except San Luis Reservoir have proven too expensive for the program. By the operating principles laid out in the CALFED ROD, the EWA has only a low priority right to San Luis storage capacity. Thus, even when there are willing sellers of water north of the Delta, a lack of storage south of the Delta has limited the EWA’s ability to have the replacement water necessary in order to shut down the

\footnotesize{\textsuperscript{73} Interview with Geimer, \textit{supra} note 65.}  
\footnotesize{\textsuperscript{74} California Department of Water Resources, \textit{Environmental Water Account Water Acquisitions, Fiscal Year 2000-01} (Mar. 30, 2004), at \url{http://www.watertransfers.water.ca.gov/water_trans/water_trans_index.cfm} (last visited Jan. 21, 2005).}  
\footnotesize{\textsuperscript{75} California Department of Water Resources, \textit{Environmental Water Account Water Acquisitions, Fiscal Year 2003-04} (August 22, 2004), at \url{http://www.watertransfers.water.ca.gov/water_trans/water_trans_index.cfm} (last visited Jan. 21, 2005).}  
\footnotesize{\textsuperscript{76} Interview with Geimer, \textit{supra} note 65.}  
\footnotesize{\textsuperscript{77} \textit{Id}.}
Delta pumps. The only feasible method for increasing storage south of the Delta is in groundwater reservoirs and the estimated cost for this storage is $200/AF.\textsuperscript{78} This would more than double the cost of any water used by the EWA. Without a substantial increase in budget, it is difficult for the EWA to grow beyond its current size.

Benefits of the EWA

One benefit to the EWA is that it allows fish managers to make things happen. With B2, says Fullerton, wildlife agencies aren’t managing water directly, just requiring users to modify operations.\textsuperscript{79} B2 doesn’t allow for storage, nor does it allow for remuneration. When a user loses water, he or she gets no compensation. The result is that users tend to fight regulations, which means it takes much longer to make things happen. “They’ve been fighting over B2 for 13 years,” says Fullerton. “The EWA is much more cooperative. You don’t have people who hate each other.” The EWA is, itself, policy neutral. “The EWA makes no scientific choices at all,” says Fullerton. “Tell me the science and we can make EWA adapt to it. It’s an operational tool. The whole point is not to hard wire in some vision of the science, but to apply it as [administrators] think appropriate.”\textsuperscript{80} The EWA is, therefore, theoretically amenable to the latest science and information, and can be quickly adjusted, giving it a further advantage over regulations.

Drawbacks: Cost Incentives/Externalities

The EWA as administered has several structural flaws. While the EWA does put cost pressure on fisheries managers, as Fullerton noted, there is no such pressure put on water users. They have no incentive to cut down on their use—they do not fund the EWA, and they are guaranteed the water they were otherwise due under contract. Perhaps one reason that the EWA

\textsuperscript{78} Id.
\textsuperscript{79} Fullerton Interview, Jan. 5, supra note 70.
has met with so little resistance from water users is that they bear none of the cost—the public pays for the water, so why would users care about the EWA at all? Given that contractors derive a significant benefit from the EWA, enhanced system reliability, the “beneficiary pays” principle enshrined in the CALFED ROD suggests that users should at least pick up some of its cost. Indeed, some environmentalists characterize the EWA as paying water users to break the law (that is, EWA §7). One joke making the rounds at agencies is that EWA stands for “Exporters’ Water Account.”

Viewed this way, the EWA as a program is less about the environment and more about system reliability. Eddy Moore, Planning and Conservation League, describes the EWA as an insurance policy for state water contractors, a way of allowing them to meet water regulations while not giving up anything in return.”

81 The EWA has the potential to do some good depending on how it’s funded. If funding is internalized [to water users], it could be one tool in the toolbox.”

82 He notes, however, that the EWA is “not the only thing that’s needed to protect the environment.”

83 Dan Odenweller, an environmentalist and retired employee of the California Department of Fish and Game, points out that fish are budgeted an allotment of water, while users have no such limitations.

84 In Odenweller’s view, this structure itself illustrates the lack of balance between the twin goals of fish preservation and system reliability.

Currently the EWA is funded out of state bond money, but Jim Lecky, Assistant Regional Administrator for Protected Resources (Southwest Region) at NOAA Fisheries, describes this source as neither reliable nor ongoing. “It will ultimately dry up,” he says. “There’s no ironclad

80 Id.
81 Telephone Interview with Eddy Moore, Transportation Director, Planning and Conservation League (Jan. 11, 2005) [hereinafter Moore Interview].
82 Id.
83 Id.
84 Telephone Interview with Dan Odenweller, California Dept. of Fish and Game (ret.) (Jan. 11, 2005) [hereinafter Odenweller Interview].
commitment to fund the EWA absent bonds."

The EWA was recently funded for another three years (2004-2006). During this time there is supposed to be an agreement for continued operations beyond year 7 funded with user fees. According to Geimer of the DWR, however, this renewal is dependent on a federal appropriation that has yet to occur. She believes, based on discussions with colleagues at the Bureau, that the EWA is unlikely to be adequately funded beyond June 30th of 2005 due to federal budget priorities.

There is a move to tie South Delta improvements—notably, the 8500 Banks project discussed below—to user funding of the EWA, but thus far there is nothing definite. David Fullerton said that that SWP contractors felt that they had done all the mitigation that they needed to under the 1994 CALFED Framework agreement and SWRCB Decision1641. For the contractors to be willing to do more (e.g. pay for the EWA) they need to get something in return – more pumping at Banks. In the absence of bond funding, a user-fee would have to support the entire program.

In order to fund the EWA at its current size, user fees would have to raise approximately $30 M per year. A user-fee based program that includes both CVP and SWP contractors probably makes the most sense, but because CVP contractors pay a dramatically lower price for water than SWP contractors, the percentage change in their water cost would be substantially greater. Given average deliveries to the SWP of 3 MAF, a user fee would have to be on the order of $10/AF. This represents a relatively minor increase in the cost of water to SWP contractors.
contractors, who in 2002 paid an average of $246/acre foot ($711 M in total payments and 2.89 MAF delivered for 2002). CVP users have average annual deliveries of 7 MAF at a cost of $17.14 per acre foot. If the CVP were included in the user-fee program, then the cost per acre foot would drop to $3/AF ($30 M/10 MAF). This price would represent an insubstantial increase to SWP contractors but a more than 17% increase in cost for CVP contractors. Given that SWP contractors are mostly municipalities that are more amenable to the user-fee idea than the agricultural contractors that dominate the CVP. This price increase is likely to represent a substantial obstacle to a user-fee distributed across the CVP and the SWP. Of course all of this assumes that the EWA remains at its current size and at least some believe that it should be substantially larger in order to be more effective.

Another problem is that expectations about who pays for and benefits from water haven’t changed. State water contractors feel like they should be getting all the water they need because they pay for the water infrastructure, says Jim Lecky. Ideally, he says, the original contracts should’ve included mitigation, but since they were made in the 1960’s, in a different climate and with different understandings of the Bay Delta ecosystem, they don’t. Now, the current system externalizes the environmental costs of water projects. But, he notes, there are two ways of looking at the environmental costs and benefits. One view is that the environmental costs should be legitimately placed on the users. Another view is that water projects (and

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93 California Department of Water Resources, supra note 91.
95 Geimer Interview, supra note 65; Fullerton Interview, Jan. 12, supra note 89.
96 Lecky Interview, supra note 86.
97 Id.
concomitant development), as well as species protection, are public benefits that accrue to everyone. Thus, the EWA might have avoided the contentiousness problems of B2 water only because the issue of funding was avoided. It’s one thing to agree to the principle that the beneficiary pays; it’s another thing entirely to decide who the beneficiary of a given action is.

Fullerton is more bullish about the prospect of user funding. He believes that a user-funded EWA won’t make relationships hostile; rather, it will just make users monitor fish agencies more carefully. It is unclear, however, why the contentiousness of B2 water won’t apply here. One could easily say that EWA is a win-win only because the public pays; B2 is contentious only because somebody wins and somebody loses. Introduce user funding to the EWA and it seems to engender all of the problems that have been encountered in the B2 program. On the other hand, because the SWP is dominated by a relatively small number of large municipal contractors, and these contractors are more able or willing to pass additional costs on to rate-payers, user funding of the EWA may be politically feasible. In particular, since 50% of SWP water goes to the MWD, this single agency’s perspective on user fees is critical to whether they become a long-term source of funding for the EWA. Given the positive comments made regarding them by the MWD management that we interviewed, they may well form a part of the EWA’s future.

The EWA and species protection: who is the real beneficiary?

A critical question that must be answered in evaluating the continued funding of the EWA is whether or not it actually benefits endangered fish. There is no question that the program has improved system reliability relative to the late 1990’s, but if this is the only program benefit, then there is a good case that users should pay for the entire program. If the

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98 Id.
99 Fullerton Interview, Jan. 5, supra note 70.
EWA does actually provide benefits to endangered fish species, then the public at large should pay for at least some of it.

There is general consensus that there is not enough evidence to conclude that the EWA alone has increased Delta Smelt populations. Moore says that the EWA has been beneficial to a degree. “Essentially what you’re doing is shifting pumping later in the year,” he says. “But whenever you pump there are environmental impacts.” Fullerton’s take on the efficacy of EWA vis a vis species is that it isn’t showing much response, particularly with Winter-Run salmon. For smelt, the jury is out—he thinks EWA might still have a role to play. On the ground, says Fullerton, EWA operations have shifted heavily toward the smelt.

Data for EWA’s effects on the Delta Smelt are inconclusive. The 2004 5-year review concluded “… at this time it is unclear what, if any, effect EWA actions have had on the Delta Smelt population. The last 3 years of survey data show declining numbers of Delta Smelt. However, 3 years of operation are insufficient to determine EWA’s impact on Delta Smelt, for even if abundance indices were to indicate increases, they represent too limited a timeframe to overcome natural variance.” Jim White, one of the wildlife managers at DFG responsible for EWA operations, suggested that the problem may be poor monitoring of when juvenile smelt—which easily slip through pump screens—are present at the pumps. Kill these fish and there are no adults later in the season; but right now, we have no way of knowing when there is high take of smaller smelt.

100 Interview with Geimer, supra note 65.
101 Interview with Moore, supra note 81.
102 Interview with Fullerton, Jan. 5, supra note 70.
103 Id.
104 5 Year Review, supra note 33 at 15.
105 Telephone Interview with Jim White, Staff Environmental Scientist, California Department of Fish and Game (Jan. 7, 2005) [hereinafter White Interview].
106 Id.
There is some agreement that in at least one year, the EWA has helped to reduce the incidental take of endangered Chinook. This at least in part has to do with Chinook’s far greater size than Smelt. Because Chinook are more easily identified and counted than Smelt, it is possible to enumerate exactly how many are being killed at the Pumps per hour and so to estimate how many have been saved by any particular EWA compensated pumping curtailment.

For example, in 2001, Jim White of DFG estimates that pumping curtailments from January to March 2001 reduced take at the pumps from 26,000 to 20,000 outmigrating juvenile Winter-Run Chinook. The 6000 fish that were saved are estimated to have been saved represented approximately 3% of the outmigrating juvenile population for that year. But this savings came at a cost of 200 TAF. Given EWA acquisition costs for the 2000-2001 water year of $176/acre foot, this implies the cost to the EWA per fish was more than $5800. In comparison, the VAMP, which utilizes a comparable volume of B2 water, is estimated to save on average 8% of the outmigrating Chinook in the San Joaquin River. Tina Swanson of the Bay Institute, Bruce Oppenheim of NOAA Fisheries, and Jim White of DWR all wondered if money for salmon couldn’t be spent more effectively. All three felt that targeted water rights purchases in smaller tributaries (the slow to get started Environmental Water Program) might be far more helpful to endangered salmon at a potentially lower cost. This feeling is strong enough that in the 2003-2004 water year, the EWA team elected to make no export curtailments before April 15 (when Winter- and Spring-Run Chinook are migrating up and downstream) and

107 Id.
108 California Department of Water Resources, supra note 74.
109 White Interview, supra note 105.
110 Swanson Interview, supra note 69; Oppenheim Interview, supra note 61; White Interview, supra note 105.
111 Id.
to devote 104 out of 124 TAF of that year’s EWA water to pump curtailments in late May through June, the period when Smelt take is highest but Chinook take is typically low.\footnote{112}{Jim White, California Department of Fish and Game, \textit{EWA Effects on Salmonids 2001-2004}, Presentation to the 2004 EWA Technical Review Panel Meeting (Nov. 8-10, 2004), at \url{http://www.science.calwater.ca.gov/workshop/ewa_presentations.shtml} (last visited on Jan. 21, 2005).}

Finally, some expressed the view that the EWA has never been large enough to really test its effectiveness. The EWA is not large enough to solve all environmental problems, says Lecky of NOAA Fisheries. “We could solve the smelt problems and the salmon problems if the pot were big enough.”\footnote{113}{Interview with Lecky, \textit{supra} note 86.} Each of the fish species have needs at different times of the year. From January through March, Winter-Run Chinook pumping curtailments are appropriate. From April through Mid-May, the Spring-Run Chinook would benefit most from pumping curtailments. It is not until late May or June that high take of Smelt is observed at the pumping plants. There has never been enough funding for the EWA to fully address all of these needs.\footnote{114}{Interview with Oppenheim, \textit{supra} note 61.} Geimer of DWR agrees, adding that the EWA needs substantially more money in order to purchase south of Delta storage in order to fully utilize potential north of Delta water supplies.\footnote{115}{Interview with Geimer, \textit{supra} note 65.}

\textbf{The EWA is a Multi-jurisdictional/Multi-agency Program}

Perhaps the most distinctive feature of the EWA is its multi-jurisdictional, multi-agency character. EWA operations are spread over the entire state of California. In order for the EWA to function as intended, the active cooperation and coordination of federal and state agencies responsible for wildlife management and the operation of California’s water projects as well as numerous water districts is required. Our interviews suggest that this cooperation has had significant benefits. Agencies that once viewed each other as enemies now view each other as
allies working towards a collective goal. It is possible that the ability to achieve agreement on the operation of the EWA has led to a focus on this program to the exclusion of others –ones that might help fish more but that are likely to involve a great deal more conflict. Ultimately, one has to ask if the EWA has helped fish and if not, whether it justifies its opportunity costs both in terms of the time spent administering the program and in terms of the other projects that could have been funded. One must also ask if, in the absence of benefits for fish, the program should be paid for by state and/or federal taxpayers or by water contractors that receive its other benefits.

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116 Geimer Interview, supra note 65; Oppenheim Interview, supra note 61; White Interview, supra note 105.
The major benefit of the EWA is trust

Participants in the EWA from both the project operators and the wildlife management agencies were extremely positive about one aspect of the program. All felt that the EWA had done a fantastic job of building trust and understanding between the individuals concerned with

\[117\] Reprinted from, A2, Fish Action Decision Process, at
fish and those concerned with water deliveries. Oppenheim of NOAA fisheries stated that before the EWA, pumping curtailments were a battle and there was little understanding on the part of the wildlife managers of what was possible and impossible for the water projects to do.\textsuperscript{118} Geimer of DWR said that she and her bureau colleagues had developed a much better understanding of the needs of the fish because of the weekly meetings.\textsuperscript{119} Weekly meetings of the EWA Team (EWAT), composed of technical staff from the wildlife management and project operator agencies at both the state and federal level, and the Water Operations Management Team (WOMT), composed of management level staff from the same agencies, have encouraged collaboration and efforts to take the most advantage of the water that the EWA could afford to purchase or that was available to it from other sources. (Figure 6) This process was further helped by the fact that the personnel changed little on the EWAT and the WOMT during the first four years of the EWA.\textsuperscript{120} Even if the EWA did not show strong benefits for the Smelt and Chinook, all parties felt that these meetings were an important step in the recovery of the salmon because for the first time, the wildlife managers and project operators saw themselves as collaborators rather than as enemies.\textsuperscript{121} Both Geimer and White also suggested that integration of the EWA operations with the federal B2 water program was relatively good because there was substantial overlap between the EWAT and B2 interagency Team (B2iT).\textsuperscript{122} This de facto integration has fostered collaboration between the EWAT and the B2iT on programs such as the VAMP. Today, those responsible for fisheries management have a developed understanding of how the CVP and the SWP operate that they did not possess until the advent of the EWA. This

\textsuperscript{118} Oppenheim Interview, supra note 61.
\textsuperscript{119} Geimer Interview, supra note 65.
\textsuperscript{120} Oppenheim Interview, supra note 61.
\textsuperscript{121} Geimer Interview, supra note 65; Oppenheim Interview, supra note 61; White Interview, supra note 105.
\textsuperscript{122} White Interview, supra note 105; Geimer Interview, supra note 65.
sophistication allows them to make sophisticated suggestions for modifications to project operations. At the same time, when project operators see an opportunity for a fish related action at no cost to project contractors, they are very likely to suggest it to the wildlife managers.

**Consensus and Cooperation have not Produced Results**

Without question, the EWA has fostered a greatly improved relationship between those responsible for the recovery of endangered fish and those responsible for project operation. According to Fullerton, the fish agencies “really like this tool [EWA]” because they can use it to “get things done.” It gives them more control. But the real issue is what, in fact, is getting done. Is the EWA an example of a program that gets something done just for the sake of doing something? And, if so, is it using resources—both financial and managerial—that might be better spent elsewhere? The evaluation of the EWA experiment, to the extent that such evaluation has been done, tends to show that there have been little or no benefits for the Delta Smelt and only very small benefits for endangered Chinook at a high cost in terms of water, money, and agency man-hours. At this point, wildlife managers are becoming skeptical about the EWA’s overall importance to the recovery of the Smelt and Chinook. “It’s [EWA] something that’s doable, which is part of the appeal,” says Steve Lindley, an ecologist at the Southwest Fisheries Science Center of NOAA. “If you could do anything with the money, there are definitely other things that would provide a better return.... Saving a few percent of the totals at the pumps is helpful, but it’s an extremely expensive way to do it.” Lindley cites cooler water for natal salmon as a more cost-effective program—an entire year of salmon can be

123 Fullerton Interview, Jan. 5, supra note 70.
124 Telephone Interview with Steve Lindley, Ecologist, Southwest Fisheries Science Center, NOAA (Jan. 7, 2005) [hereinafter Lindley Interview].
125 Id.
saved by releasing cold water from dams.¹²⁶ Oppenheim of NOAA Fisheries also suggested that if he could choose, he would spend EWA money on substantially improving Chinook habitat in small tributaries (the EWP) and on raising the height of Shasta and Oroville Dams to increase the size of the cold water pool available for fish actions in the upstream Sacramento River spawning habitat.¹²⁷

Bill Jennings, of the environmental group Deltakeeper, thinks the EWA has failed at balancing system reliability with environmental concerns. “Obviously it’s not balancing because we’re not restoring…. [The] Smelt populations are still bouncing along the bottom. We had the lowest index on record this year. It’s obvious that it’s not working.”¹²⁸ When asked about the lack of clear environmental benefits for the EWA, Jim Lecky responded by emphasizing the other goal of the program: “The EWA is buying reliability.”¹²⁹ In the absence of concrete results for endangered fish, the cooperation between agencies and between the state and federal government engendered by the EWA takes on a lesser importance. One is also forced to wonder whether an EWA that was focused on actions that helped fish but did not necessarily improve system reliability would engender such cooperation.

**So why has the EWA been renewed?**

“It’s been reauthorized because the exporters want it,” says water-rights attorney Michael Jackson.¹³⁰ “Taxpayers’ money goes into paying for export water.”¹³¹ Water deliveries have been unaffected by fish related pump shutdowns since the EWA began. Therefore the users like the program, whether it is actually good for fish or not. Effectively, EWA has become a tool for

¹²⁶ *Id.* ¹²⁷ Interview with Oppenheim, *supra* note 61. ¹²⁸ Telephone Interview with Bill Jennings, Director, Deltakeeper (Jan. 11, 2005) [hereinafter Jennings Interview]. ¹²⁹ Interview with Lecky, *supra* note 86. ¹³⁰ Telephone Interview with Michael Jackson, Attorney (Jan. 11, 2005) [hereinafter, Jackson Interview]. ¹³¹ *Id.*

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managing ESA incidental take requirements rather than a centerpiece in the effort to recover the smelt and the salmon. It has been extremely successful as a system reliability tool but apparently unhelpful for Smelt and only marginally helpful for Salmon.

Fullerton agrees that the EWA could potentially pose the problem of spending money that could be better used elsewhere. He says the science in the last 2 years has not shown that the EWA is of significant benefit to the fish: “we’re not getting a lot of fish per acre foot,” he says. “The problem could arise that the EWA is soaking up money that could be spent elsewhere.” But Fullerton doesn’t see money spent on the EWA as zero-sum environmental money. He notes that habitat is not ignored, and states that “the EWA doesn’t take away focus from other things.” He proposes instead that agencies should have an overall budget that they can spend however they wish. If the money were well spent on EWA, it could be spent there. Otherwise, it wouldn’t have to be.

The fundamental problem with a single eco-budget, however, is that the EWA also provides system reliability; if having a single environmental budget for the Bay-Delta meant deciding not to spend money on EWA in favor of other actions, thereby compromising system reliability due to shutdowns, contractors would most likely not favor it. They would with some justification point to the principle in the CALFED Framework of no further uncompensated loss of water deliveries.

8500 Banks and the Death of Consensus

EWA assets have been shrinking through time as users’ consumption of water has increased and excess pumping capacity has been lower than expected. Given that pumping capacity has been one of the limiting factors for the EWA program, a plan to increase the

132 Fullerton Interview, Jan. 5, supra note 70.
133 Id.
capacity of the Banks Pumping Plant in the south Delta from 6680 to 8500 cfs (8500 Banks) has been proposed as a potential boon both to south of Delta water contractors and fish. 8500 Banks has been described by different stakeholders as the opportunity to establish a permanent solution to EWA funding\(^\text{135}\), the death of the CALFED consensus based decision framework\(^\text{136}\), or the project that may likely drive the endangered fish to extinction\(^\text{137}\).

The 8500 Banks project, when completed, will at least initially create excess pumping capacity, half of which will belong to the EWA—assuming, of course, that 8500 Banks can be operated without significant degradation of Delta habitat or water quality.\(^\text{138}\) This excess capacity is likely to be confined to the short term only: as project operators learn how to better utilize the excess pumping capacity, they will be able to promise more water to their contractors and thereby reduce “excess” pumping capacity. Any benefits to the EWA in the meantime are likely to be slight—without the guarantee of increased storage south of the Delta, it is unlikely that the EWA will be able to utilize any excess capacity.\(^\text{139}\)

The most significant potential environmental benefit to the 8500 Banks proposal is its potential for funding the EWA through user fees. Because the project will provide contractors with larger supplies than they are entitled to under the 1994 CALFED Framework and associated agreements, contractors are at least open to the idea of paying user fees to go towards the EWA in exchange. Depending on the revenues that an 8500 Banks related user-fee generated, it might solve many of the year-to-year funding problems of the EWA. As stated earlier, however, these commitments are prospective at best. Moore is concerned that the federal

\(^{134}\) Id.

\(^{135}\) Fullerton Interview, Jan. 12, supra note 89.

\(^{136}\) Swanson Interview, supra note 69.

\(^{137}\) Oppenhein Interview, supra note 61.

\(^{138}\) Geimer Interview, supra note 65; CALFED ROD Attachment 2 at 2, supra note 72.

\(^{139}\) Geimer Interview, supra note 65.
and state governments may agree to take actions assuming a well-funded EWA before there are binding agreements to pay for it.\textsuperscript{140} Indeed, the controversial “no jeopardy” biological opinions, discussed in greater detail below, depend on an extant (and enhanced) EWA. Whether the combination of 8500 Banks and a user-fee based EWA is a good compromise between the needs of fish and water contractors or not, the 8500 Banks proposal did not represent a negotiated settlement between the two interests. The CALFED process was from the beginning intended to be an open, inclusive, and consensus based approach to making decisions about the future of California’s water supplies.\textsuperscript{141} But in negotiating the “Napa Agreement”\textsuperscript{142}—which includes 8500 Banks and the more detailed Long Term Central Valley Project and State Water Project Operations Criteria and Plan (OCAP)\textsuperscript{143}, the SWP, the CVP, and representatives of their contractors met to hammer out a new plan for CVP/SWP integrated operations without the presence of Delta agricultural interests, environmentalists, and county of origin water rights holders. The exclusion of environmentalists and the wildlife management agencies responsible for endangered fish species was perceived as a breakdown of the CALFED process and a return to the backroom dealing of the past by both sets of stakeholders.\textsuperscript{144}

The OCAP §7 Biological Opinion

Because the proposed changes to the operation of the CVP and the SWP were significant enough to require a new ESA §7 jeopardy consultation, the Bureau prepared a Biological Assessment of the OCAP which was submitted to FWS and NOAA fisheries. Both agencies found that the OCAP would not produce jeopardy for either the Delta Smelt or listed salmonids.

\textsuperscript{140} Moore Interview, supra note 81.
\textsuperscript{141} CALFED ROD, supra note 66 at 31.
\textsuperscript{143} U. S. BUREAU OF RECLAMATION, LONG TERM CENTRAL VALLEY PROJECT AND STATE WATER PROJECT OPERATIONS CRITERIA AND PLAN (OCAP), at www.usbr.gov/mp/cvo/ocap/ocap_6_30_04.pdf (last visited 1/17/05).
\textsuperscript{144} Oppenheim Interview, supra note 61; Swanson Interview, supra note 69.
This finding was not without controversy, however. In particular, the NOAA Fisheries OCAP process has been marred by allegations that the technical level authors of the draft jeopardy opinion originally reached the opposite conclusion--that the OCAP and 8500 Banks would result in increased jeopardy to listed salmonids--and were forced to change their finding after upper level management at NOAA allegedly consulted with Bureau officials. Several of these technical staff were so upset by the no jeopardy finding that they leaked the draft finding to the press.\textsuperscript{145} Jim Lecky, the official charged by technical staff with altering the jeopardy finding, responded to the leak by stating that “There were some key errors made by the staff. It’s not a matter of changing the science.”\textsuperscript{146} And that "This was just supervisor-employee stuff. I received a draft document that had some errors in it, and when those were corrected, it changed the conclusion."\textsuperscript{147}

This view was not shared by several of the staff responsible for writing the draft finding. One, Bruce Oppenheim, said that the no jeopardy OCAP §7 opinion was a product of “consensus” between the Bureau and NOAA and characterized the process leading to it as “highly unusual”.\textsuperscript{148} Oppenheim also characterized the opinion as based on promises rather than on what the CVP and SWP have actually done to help fish. Id. Another who asked that his name not be used stated, "I haven't seen anything this bad at NOAA since working here. The Sacramento office (of NOAA Fisheries) is totally demoralized.”\textsuperscript{149}

Lecky described several major errors in the draft opinion. One was a significant over estimation of the consequences for Winter-Run Chinook of moving the temperature compliance

\textsuperscript{146} Id.
\textsuperscript{147} Democrats Seek Probe Of Calif. Water Plan, Washington Post, October 9, 2004, at A12.
\textsuperscript{148} Oppenheim Interview, \textit{supra} note 61.
\textsuperscript{149} Id.
point in the Sacramento River from Bend Bridge to Balls Ferry, 20 miles upstream. The temperature compliance point is the point at which water temperatures in the river must be equal to or less than 56°F in order to insure successful salmon spawning. Another error described by Lecky involved mis-assignment of various impacts on the salmon to the bureau. For instance, he pointed out that operation of the New Melones Dam on the Stanislaus was cited as impacted salmon populations when in fact, downstream non-CVP dams, constructed before New Melones, had effectively eliminated the upper reaches of the river as spawning habitat. Lecky responded to the criticism that the opinion was based on promises rather than actions by saying that if the promises of the CVP and SWP were not kept, then the OCAP would require reconsultation.

Environmentalists are as upset as NOAA fisheries staff about the outcome of the OCAP §7 opinion. Tina Swanson of the Bay Institute characterized the report as “not science-based”. She also sees it as evidence, along with the Napa Agreement, that the consensus-based, balanced, and open decision-making process mandated by CALFED has broken down. Her view is that NOAA Fisheries, under pressure from the Bush Administration, has backed away from a goal of the recovery of California fishes to a goal of survival. She is particularly troubled by the fact that while the 8500 Banks project has already been specified, the mitigations for it, including a user-fee based EWA, have not been negotiated.

In response to the controversy, several members of Congress have asked the Inspectors General at Interior (Bureau) & Commerce (NOAA) to look into the process that led to the NOAA Fisheries §7 opinion. 19 members of Congress, including George Miller and

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150 Lecky Interview, supra note 86.  
151 Id.  
152 Id.  
153 Swanson Interview, supra note 69.
Democratic Minority Leader Nancy Pelosi, signed the request for an investigation. The request stated that, “even though officials have suggested that ‘document sharing is commonplace’ and that changes were made to ‘ensure they had appropriately interpreted the Bureau’s plans,’ given the scope of the changes, and the Bureau’s track record of meager analysis and secrecy, we believe the explanation is insufficient.”\(^{155}\) The request goes on to state that the actions taken by NOAA are “counter to the spirit and requirements of the CVPIA and the Endangered Species Act, and may further undermine public confidence in the Bureau of Reclamation's and NOAA Fisheries' ability to appropriately manage the resources that the public has entrusted to them.”\(^{156}\) These investigations are currently ongoing.

The FWS also prepared a preliminary OCAP §7 opinion in order to assess the effects of proposed project operations on the Delta Smelt. Here again, the FWS found that the continued operations would not put the survival of the smelt in jeopardy. It notes possible deleterious effects from 8500 Banks but concluded that the harms would be offset by the EWA and other conservation mechanisms.\(^{157}\) While the opinion provides for reconsultation should the effects of the project change, promised but as yet uncertain mitigation actions were the primary justification for a finding of no jeopardy. In the words of the opinion’s press release, “The OCAP for the first time incorporates the Environmental Water Account (EWA) into the Delta Smelt protective actions, along with other management measures”.\(^{158}\) If there’s no EWA

\(^{154}\) Id.


\(^{156}\) Id.


funding, however, is it responsible to include the EWA for the first time?

Irrespective of the science, the controversy over the opinion is a sign that consensus has broken down and that old battle lines between project operators, wildlife managers, and environmentalists are being redrawn. Steve Lindley of NOAA Fisheries says, “It boggles my mind as a scientist…. It’s a policy decision. I don’t think it’s very well supported by the science.”\(^{159}\) Bruce Oppenheim concludes, “OCAP and 8500 Banks will likely lead to the extinction of at least one of the endangered fish species.”\(^{160}\) But views amongst water contractors in the CVP and SWP could not be more different. David Fullerton of the MWD argues that the original no jeopardy opinions were a function of employee brinksmanship.\(^{161}\) He said that there has been an enormous amount of restoration. “Things haven’t gotten worse. We’ve spent hundreds of millions of dollars on restoration. If the species were in jeopardy, people would be asking what we’re spending the money on--what has it gotten us?”\(^{162}\) Fullerton believes employees of the agencies were playing “leverage games” so they could threaten other interests in negotiations. “It would’ve been disastrous if they’d succeeded—it would’ve undermined CALFED.”\(^{163}\)

The one major stakeholder with a potential veto on the OCAP and 8500 Banks is the California Department of Fish and Game. Wildlife managers responsible for Delta Smelt and the endangered salmon runs refused to comment on the OCAP Biological Opinions (BO’s) for this paper. So far the DFG has taken no official position on the OCAP BO’s. However, because all four species are listed under the California Endangered Species Act (CESA) as well as the

\(^{159}\) Interview with Lindley, supra note.
\(^{160}\) Interview with Oppenheim, supra note 61.
\(^{161}\) Fullerton Interview, Jan. 5, supra note 70.
\(^{162}\) Id.
\(^{163}\) Id.
federal ESA, DFG is required by law either to issue an incidental take permit under the CESA, or make a determination that an incidental take permit issued by a federal wildlife management agency is consistent with CESA. Until the DFG issues either one of these opinions for the OCAP and 8500 Banks, the SWP cannot be assured that its actions will be found to be in compliance with CESA or if additional state mandated mitigation measures will be required as a condition of a no jeopardy finding.

Conclusions and Questions

CALFED is a remarkable attempt to resolve a host of complicated problems with an open, collaborative, consensus based approach. One of the critical issues the program seeks to address is the damage to native species of fish wrought by the CVP and the SWP. The centerpiece of that effort has been the EWA. The EWA represents the best of what CALFED has achieved: it is a program to help fish that has unified the various stakeholders. At the same time, it is a symbol of the fact that the fish species are not much better off (and in the case of the Smelt, actually worse off) than when the program was begun. One has to ask whether the seeming unity of support for continued operation of the program makes sense.

But this is the question that no one seems to be asking. Fisheries biologists have adopted the view that the EWA is part of the environmental baseline and will continue indefinitely. At the same time, water project operators and contractors seem committed to finding a way to fund the program. The EWA spends precious assets for endangered species conservation that might be spent in other ways. Yet as the program is being renewed for another three years, as the EWA has been incorporated into the environmental baseline of the §7 biological opinions, and as discussions aimed at securing it a permanent source of funding are underway, few people

164 California Endangered Species Act, Cal. Fish & Game Code §2081(b).
165 Cal Fish & G Code §2081.1.
involved in the process seem to be asking whether a continued EWA is a good idea. We think that this question should be asked first and with some urgency.

Given the limited willingness on the part of the project operators and their contractors to pay for fish-related projects, epitomized by the “no further uncompensated loss of water supply” clause in the San Francisco Bay-Delta Agreement\textsuperscript{166}, any willingness to pay for environmental actions should not be squandered on programs that do not actually provide benefits to fish. A commitment to fund the EWA with user fees would essentially lock in a system that has not proven over the past 4 years to be an effective measure for increasing fish populations in the Delta. If the EWA is reinstituted with user fee funding, it should be clear that this is because the contractors, rather than the fish, are the beneficiaries of the program and that the cost allocation is therefore consistent with the “beneficiary pays” principle enshrined in the CALFED ROD.

The costs for the endangered fisheries of the Central Valley may be catastrophic if populations do not recover significantly above their current levels before the next multi-year drought. The allocation of substantial fish protection assets to an activity that provides little if any benefit to fish leads toward just such a result.

\textsuperscript{166} \textit{supra} note 64.